United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota/Wisconsin Ecological Services Field Office
4101 American Boulevard East
Bloomington, Minnesota 55425-1665

In Reply Refer To:
FWS/MN/WI ESFO

August 7, 2017

Mr. Chad Konickson
U.S. Army Corps of Engineers
180 Fifth Street East, Suite 700
St. Paul, Minnesota 55101

FWS No. 03E19000-2017-F-0079
Formal Consultation on eastern massasauga rattlesnake

Dear Mr. Konickson:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion and is based on our review of the US Army Corps of Engineers (Corps) issuance of a Section 404 Clean Water Act Permit for the proposed Meteor Timber Processing Plant and Rail Facility Biological Assessment and potential effects to eastern massasauga rattlesnake *(Sistrurus catenatus)*. The biological assessment, dated October 2016 and letter requesting consultation on the proposed processing plant and rail facility were received in our office on November 1 and later revised to include new information and a request for formal consultation on January 27, 2017.

This biological opinion is based on the best available scientific and commercial data including meetings, electronic mail and telephone correspondence with the Corps, Wisconsin Department of Natural Resources and Stantec, as well as from Service files, pertinent scientific literature, discussions with recognized species authorities, and other scientific sources. A complete administrative record is on file at the Minnesota-Wisconsin Ecological Services Field Office.

Please contact the Service if the project changes or new information reveals effects of the proposed action to proposed or listed species or critical habitat to an extent not covered in your biological assessment. If you have any questions or comments on this biological opinion, please contact Mr. Andrew Horton, Fish and Wildlife Biologist, at 952-252-0092 (extension 208), or via email at *andrew_horton@fws.gov*.

Sincerely,

Peter Fasbender
Field Supervisor

Enclosure

BIOLOGICAL OPINION

Effects to Eastern Massasauga Rattlesnake From Construction of the Meteor Timber Processing Plant and Rail Facility

FWS TAILS Code: 03E19000-2017-F-0079

Prepared by:
U.S. Fish and Wildlife Service
Minnesota-Wisconsin Field Office

August 2, 2017

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Appendices

Appendix A. Wisconsin Department of Natural Resources Incidental Take Permit – Conservation Plan for eastern massasauga rattlesnake and the Meteor Timber LLC Rail Site Project

This biological opinion was issued to the U.S. Army Corps of Engineers (Corps) and analyzed the effects of the Meteor Timber Processing Plant and Rail Facility (Project) in Monroe County, Wisconsin on the federally threatened eastern massasauga rattlesnake (*Sistrurus catenatus,* EMR). The individual site-specific consultation under Section 7 of the Endangered Species Act was used to address one proposed project. This consultation analyzed the direct, indirect, and cumulative impacts from the development project on eastern massasauga.

Section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 United States Code [USC] §1536), requires Federal agencies (U.S. Army Corps of Engineers in this case) to 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 critical habitat that has been designated for those species. In addition, under Section 7(a)(1) of the Endangered Species Act, all federal agencies are required to carry out programs for the conservation of federally listed species. This biological opinion satisfies the U.S. Army Corps of Engineer's Section 7(a)(2) consultation requirement.

The Service concluded that the effects of the Project are not likely to jeopardize eastern massasauga and no critical habitat has been designated.

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on the Service's review of the biological assessment for the Meteor Timber Processing Plant and Rail Facility (hereafter referred to as the BA) (USACE 2016). The BA was received at the Service's Minnesota-Wisconsin Ecological Services Field Office on November 1, 2016 as part of a letter requesting us to initiate formal consultation on potential adverse effects on the northern long-eared bat (*Myotis septentrionalis*) and eastern massasauga. Since receiving the U.S. Army Corps of Engineers (Corps) initial determination, consultation was completed informally for northern long-eared bats and is not addressed in this biological opinion. On January 27, 2017 a revised effects determination letter and supporting information was provided in which a "may affect, likely to adversely affect" determination was made for eastern massasauga.

This biological opinion was prepared in accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) and is the culmination of formal Section 7 consultation under the Act. The purpose of formal Section 7 consultation is to ensure that any action authorized, funded, or carried out by the Federal government is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any officially designated critical habitat of such species. A complete administrative is available at the Minnesota-Wisconsin Field Office.

CONSULTATION HISTORY

June 7, 2016: Stantec Consulting Services Inc. (Stantec) spoke with USFWS (Phil Delphey) regarding the schedule of the federal listing of the EMR and what type of permitting may be required for the project. Discussed habitat assessment results and consultation with the WDNR,

and whether a Technical Assistance Letter/Biological Opinion would be a possibility rather than a formal federal Habitat Conservation Plan for an Incidental Take Permit.

July 5, 2016: Stantec spoke with Andrew Horton at the USFWS. He mentioned giving the project a cursory read through, and had a brief discussion with C, but would need to fully review submitted materials.

August 17, 2016: Stantec and Weld Riley spoke to WDNR (Rori Paloski) and USFWS (Andrew Horton). USFWS recommended following a "Formal Consultation" process under ESA Section 7 of the endangered species act. The process includes submitting a Biological Assessment to the USFWS describing potential effects of the action on federally listed species.

November 1, 2016: A request for informal consultation was received from the Corps with "may affect, not likely to adversely affect" species determination for gray wolf, northern long-eared bat, eastern massasauga and Karner blue butterfly.

December 28, 2016: USFWS concurred with "may affect, not likely to adversely affect" species determination for gray wolf, northern long-eared bat and Karner blue butterfly, but recommended formal consultation due to foreseen adverse impacts to eastern massasauga.

January 27, 2017: The USFWS received updated request for formal consultation by the Corps along with a completed Biological Assessment.

March 8, 2017: The USFWS sent an email to Corps and Stantec stating that the formal consultation initiation package would be considered complete and that the final Biological Opinion would be due on June 11, 2017.

June 7, 2017: The USFWS learned of a revised state incidental take permit that includes significant conservation measures not incorporated into the effects analysis. USFWS (Andrew Horton) informed USACE (Sam Woboril) of new information that should be included in the Biological Opinion and requested an extension for completion.

June 13, 2017: Stantec provides revised Wisconsin Department of Natural Resources Incidental Take Permit – Conservation Plan for Eastern Massasauga Rattlesnake (*Sistrurus catenatus*), Meteor Timber LLC Rail Site Project, to be incorporated into the Biological Opinion.

July 19, 2017; USFWS receives draft edits of the Wisconsin incidental take permit/conservation plan from WDNR (Rori Paloski) and is waiting on agreements between the applicant, Stantec and WDNR before measures are incorporated into the effects analysis.

BIOLOGICAL OPINION

The Federal action evaluated in this biological opinion (BO) is the issuance of a Section 404 Clean Water Act (CWA) (33 USC § 1344; 33 CFR 320-332) permit by the U.S. Army Corps of Engineers (Corps) to authorize the construction of the Meteor Timber processing plant and rail line (Project), permanent fill of some wetland, and temporary matting in wetland. At least 50 percent of the Project area has been conservatively estimated to fall under Corps jurisdiction (i.e. proximate to wetlands and waters of the U.S.). This assumes a worst-case scenario that all wetlands within the Project corridor may have at least some discharge of fill. However, the final amount and percentage of the Project area that falls within the Corps jurisdiction is likely to be less upon completion of final design. Despite the distinction, this BA assesses species and Project effects as a whole. The USACE recognizes that its responsibility under Section 7 of the ESA is limited to those areas where the USACE has jurisdiction under the Clean Water Act or the Rivers and Harbors Act (e.g., discharges of dredged or fill material into waters of the U.S. associated with construction of the Project). The USACE further recognizes that the project proponent accept responsibility for actions contemplated as part of the BA provided under Section 7 for areas that fall outside USACE jurisdiction. The Project is located in Sections 1 and 2 of Township 19 North, Range 2 West in the Town of Grant, Monroe County, Wisconsin (Figure 1).

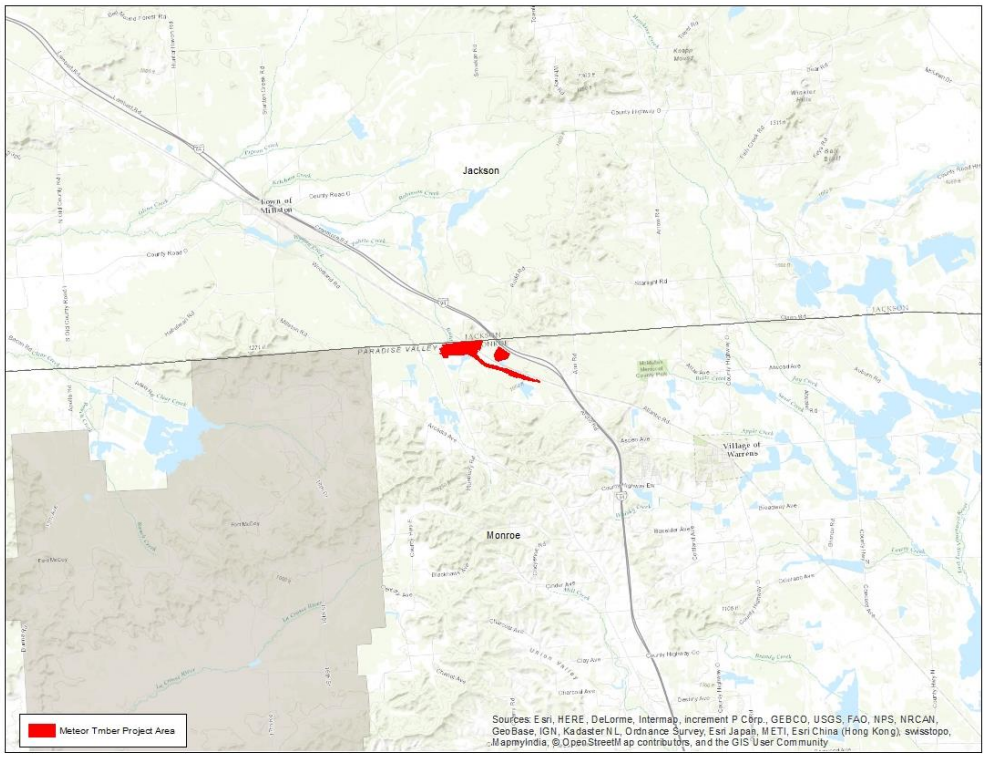

Figure 1. Project Location of the Meteor Timber Processing Plant and Rail Facility.

The Service is issuing this BO pursuant to Section 7 of the Endangered Species Act of 1973. Direct and indirect effects of Federal actions and their interrelated or interdependent activities

are analyzed to ensure they are not likely to jeopardize the continued existence of federally listed or proposed endangered or threatened species. Indirect effects of the Federal actions include "…effects that are caused by or result from the action, are later in time but are reasonably certain to occur… [.]" Interdependent actions have no independent utility apart from the proposed action, and interrelated actions are part of a larger action and depend on the larger action for their justification (50 CFR §402.02). The Corps federal action is applicable only to construction of the Project; however, the long term operation and maintenance of the Project will result from that action. Therefore, the focus of this BO is the effects of the Project, including all preconstruction, construction, operation, and maintenance activities associated therewith, regardless of permit jurisdiction or land ownership.

1. DESCRIPTION OF THE PROPOSED ACTION

Meteor is pursuing the development of a rail line and processing plant within a 747-acre parcel for the purpose of storing, loading and shipping industrial sand. The applicant proposes to construct the 132.2-acre AK Knapp Transload Site (Action Area), which will consist of a dry processing plant, rail loadout, and storage with the intent of shipping (via rail cars) extracted sand.

Rail loading and storage tracks will be located north and west of the dry plant, on the south side of the existing Union Pacific Railroad (UPR) mainline. The proposed rail facility will consist of approximately 53,400 track-feet of rail. The rail facility is designed to meet UPR requirements of unit train capabilities, including dedicated arrival and departure tracks with the ability to receive one empty unit train and ship one full unit train in an unbroken string, storage tracks, interior order track, manifest storage, and inspection access roads.

The applicant changed the preferred project design – a rail loop track design to a ladder rail spur system -- to minimize potential habitat impacts. The rail loop is the industry standard, and standard preferred by rail carriers, while the ladder spur system is less efficient and ultimately less cost effective. Despite those deficiencies, the applicant is willing to invest in the additional equipment and the additional operational expenses to avoid and minimize potential habitat impacts. Instead of a loop track which would have proceeded south and resulted in a significantly greater area of disturbance, the proposed rail spur is adjacent to the existing UP rail mainline, which will minimize potential impacts.

Standard best management practices will be employed for erosion control, and to avoid and minimize potential impacts to adjacent wetlands and waterbodies. An erosion control plan will be developed and submitted to the WDNR for their approval, which will utilize best management practices (BMPs) for disturbed areas.

1. Conservation Measures

The measures summarized below are a subset of those that are required for Wisconsin State permitting and they are provided in more detail in Appendix A, Wisconsin Department of Natural Resources Incidental Take Permit – Conservation Plan for eastern massasauga rattlesnake and the Meteor Timber LLC Rail Site Project. The measures below are specific to

construction and mitigation activities designed to minimize impacts to the EMR in upland non-overwintering habitat and wetland active season and overwintering habitat during both their active and inactive periods.

1. To minimize potential for direct impacts from vegetation clearing during the EMR's active period (April 1 – November 15) a qualified environmental monitor will search areas of existing suitable habitat immediately ahead of construction crews. If construction mats are required for vegetation clearing and exclusion fence installation within wetlands, mat roads will be installed in suitable overwintering wetland habitat as clearing progresses, during the EMR's active period (April 1 – November 15).

2. Following vegetation clearing, snake exclusion fencing will be installed according the WDNR Amphibian and Reptile Exclusion Fencing Protocol along construction areas within and immediately adjacent to suitable habitat to keep EMR out of areas where construction activities are concentrated. An environmental monitor will search areas of existing suitable habitat immediately ahead of exclusion fencing crews.

    a. During the EMR's active period (April 1 – November 15), the fenced exclusion areas will be cleared for EMR by having a qualified biologist complete up to six survey events to survey and remove snakes over a two- to three-week period, after which additional surveys and daily monitoring would be unnecessary so long as the fence is properly inspected and maintained.
    b. If construction is anticipated to begin during the EMR's inactive period (November 16 – March 31) the exclusion fence installation and snake removal protocol described in Appendix A will be completed prior to November 15.

3. Except for vegetation clearing (which will occur before matting) and final grading/vegetation restoration (which will occur after matting is removed), equipment and vehicle travel along the rail construction corridor will follow the mat road or constructed fill areas regardless of time of year. Signs will be installed instructing construction crews to stay on the mat roads or constructed fill areas.

4. Upon completion of the Project, all areas of temporary disturbance will be restored. Surface soils will be tilled and/or raked to reduce soil compaction.

5. Approximately 449.37 acres of the Project site will be placed into a permanent conservation easement (Figure 3), of which 145.34 acres will be dedicated as EMR habitat conservation areas (Figure 2), thereby protecting the EMR and its habitat from further development. Mitigation will occur through creation of open canopy upland and wetland habitat on two designated EMR conservation habitat areas within the Project property (Figure 2). Area A, situated in the southeast corner of the Project property, is approximately 74.94 acres, located south of the proposed rail spur. Area B, located in the northeast corner of the Project property, north of the existing mainline railroad, is approximately 70.40 acres.

Within Area A, upland grassland habitat will be created within the existing cranberry beds (28.96 acres). The reservoir adjacent to this cranberry bed (20.21 acres) will be drained during the EMR active period. Depending on the resulting natural water levels, most of this area will be restored to sedge meadow/wet prairie, but may include portions of emergent marsh. Approximately 8.22 acres of forested wetland, located between the reservoir and the proposed rail spur, will be cleared of trees during the EMR active period and the native understory vegetation will be managed as the dominant cover. In addition, a 16-foot wide path will be cleared of trees, located between the wetland tree clearing described above and the easternmost wildlife underpass, to help facilitate access to and from suitable habitat to the underpass.

Area B contains several upland forest patches within a larger forested wetland. Trees will be cleared from these upland areas during the EMR active period and replaced with upland grassland habitat totaling approximately 13.39 acres.

6. Four wildlife underpasses will be installed under the new rail line in strategic locations. The underpasses will be comprised of pre-cast concrete box culverts large enough to allow most wildlife to pass through. Electric lighting will be installed inside the box culverts to further encourage usage by wildlife, and programed to be on during daylight hours for the duration of the EMR active season (April 1 – November 15).

7. Open-top channels will be installed between railroad ties for the purposes of providing safe passage under the rails for herptiles and small mammals.

8. Erosion control will be implemented according to WDNR stormwater standards. Class II, Type C Erosion Control Mats will be used on the project site, which contain a woven mat of 100-percent organic fibers and are designated to be used in environmentally-sensitive areas.

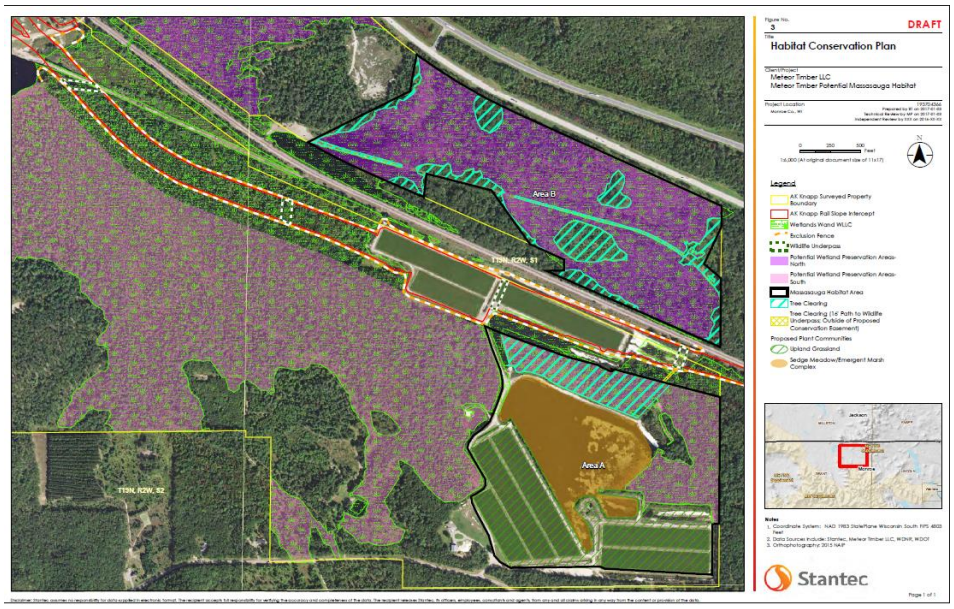

Figure 2. Location of EMR Conservation Areas.

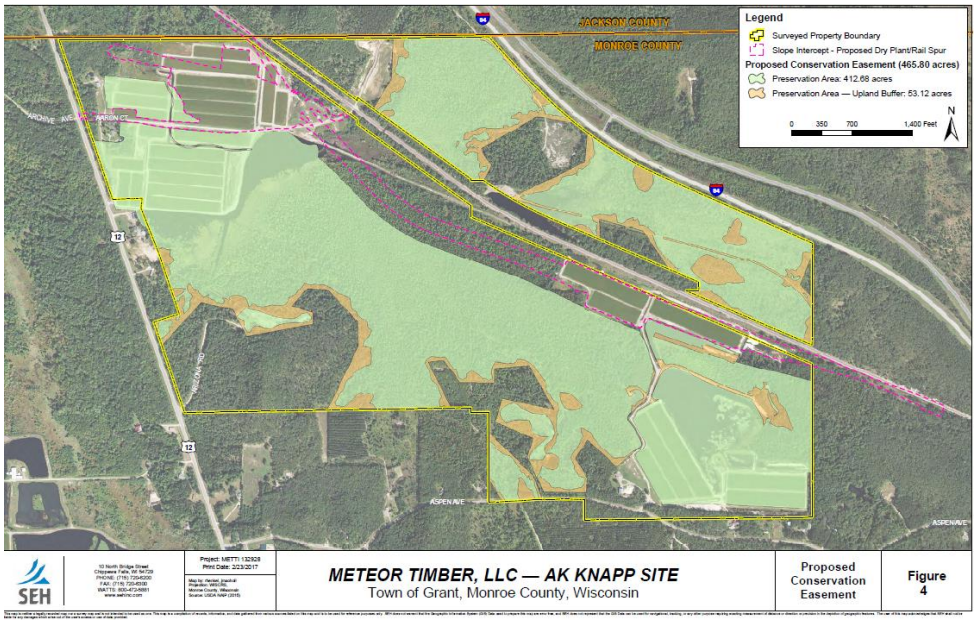

Figure 3. Proposed Permanent Conservation Easement.

2. STATUS OF THE SPECIES

This section presents the biological or ecological information relevant to formulating the biological opinion. The purpose is to provide the appropriate information on the species' life history, its habitat, and its range-wide distribution and conservation status for analyses in later sections. This section also considers the effects of all past human and natural activities or events that have led to the current status of the species.

2.1 Species Description

The eastern massasauga is a small, heavy-bodied snake with a heart-shaped head and vertical pupils. The average length of an adult is approximately 0.6 meter (two feet), with a maximum length of approximately one meter (three feet). Adult massasauga are most often gray or light brown with large, light-edged chocolate brown-to-black blotches on the back and smaller blotches on the sides, though in some areas (especially in northeast Indiana, southeast Michigan, and northern Ohio) significant numbers of individuals in populations may be nearly or completely black in color. The belly is marbled dark gray or black and there are brown stripes on the sides of the head, each of these bordered by a narrow, white stripe. Its tail has several dark brown rings and is tipped by gray-yellow keratinized rattles. Young snakes have the same markings as adults, but are paler, and have bright yellow tails that darken in color as age progresses.

The Final Rule listing the EMR as threatened under the Endangered Species Act was published in the Federal Register on September 30, 2016 (81FR67193). A Species Status Assessment (SSA) team prepared, and continues to update, an SSA report for the EMR (Szymanski et al.

2016). The SSA team was composed of U.S. Fish and Wildlife Service biologists, who developed the report in consultation with other species experts. The SSA represents a compilation of the best scientific and commercial data available concerning the status of the species, and an assessment of the impacts of past, present, and future factors (both negative and beneficial) affecting the EMR. The SSA and other materials relating to EMR listing proposal can be found on the Midwest Region website at *http://www.fws.gov/midwest/Endangered*/ and at *http://www.regulations.gov* under docket number FWS–R3–ES–2015–0145. No critical habitat is currently proposed for this species.

2.2 General Habitat Requisites

The EMR is active in the spring, summer, and fall and inactive in the winter when it hibernates. Therefore, depending on whether the snake is active or inactive determines what type of habitat is required. Active season habitat consists of thermoregulatory or basking sites, retreat sites, and foraging sites. Inactive season habitat consists of hibernacula, often within wetlands or in cavities that allow snakes to retreat to the upper portion of the water table (Reinert 1978).

EMR have been found in a variety of wetland habitat types across their range, including bogs, fens, shrub swamps, wet meadows, marshes, moist grasslands, wet prairies, peatlands, coniferous forests and floodplain forests (Minton 1972, Seigel 1986, Hallock 1991, Weatherhead and Prior 1992, Johnson 1995, Kingsbury 1996, Harding 1997, Sage 2005). At many locations, individual EMR may also move from wetlands to drier upland sites during certain parts of the year to forage, disperse, gestate, and even hibernate in some cases (Reinert and Kodrich 1982, Seigel 1986, Weatherhead and Prior 1992, Johnson 1995, King 1997, Bissell 2006). Suitable upland habitat types range from forest edges and openings, savannahs and prairies to meadows, old fields and some agricultural lands.

The eastern massasauga can be out of the hibernacula from approximately March to November in the southern part of their range (Dreslik 2005) and April to October in the middle and northern parts of the range (Beltz 1993; Mauger and Wilson 1999; Smith 2009).During the active season, EMR need highly intermixed and interspersed opportunities to bask and retreat from sun, hide from predators, attack prey without a chase, find mates, and travel to and from hibernacula seasonally through corridors that lack potentially lethal barriers such as roads.

During the winter months EMR occupy hibernacula. These hibernation sites can occur in wetland, wetland edges, wet prairie, closed canopy forests with mossy substrates (DeGregorio 2008), and in wet grassland and sedge meadow (Mauger and Wilson 1999). Across its range, EMRs have been reported to hibernate for up to six months of the year. Crayfish burrows are commonly used over much of the range, though mammal burrows, rocky crevices, rodent holes, hummocks, old stumps, rotten logs, and tree and shrub root systems are also used, (Wright 1941, Johnson 1995, Mauger and Wilson 1999, McCumber and Hay 2003, Dreslik 2005, Harvey and Weatherhead 2006, Johnson and Leopold 1998, Sage 2005) as may be cavity that reaches the water table (Reinert 1978).

Consistent hydrology at winter hibernacula sites is important in maintaining conditions that support EMR over-winter survival. To survive the winter, each individual EMR requires a

suitable hibernation site which is critical to avoid lethally low temperatures and reduce the risk of desiccation (Reinert and Kodrich 1982). Consequently, hibernation sites must provide insulated and moist subterranean spaces below the frost line where individuals can avoid freezing and dehydration (Sage 2005). Most EMRs will either return to the same hibernacula annually (Johnson et al. 2000) or to an area within roughly 100 m (328 ft.) of their previous hibernation site (Sage 2005, Harvey and Weatherhead 2006).

Requirement for Connectivity between Microhabitats
EMR need corridors between microhabitats (basking sites, retreat sites, and foraging areas) and between seasonal habitats. EMRs can traverse corridors most successfully (reduced likelihood of mortality) between habitats when there are no barriers such as roads, rivers, or anything that can act as a barrier to snake movement. The absence of roads is an important criterion because roads are a strong barrier to EMR movement due to road mortality (Shepard et al. 2008a, Shepard 2008b, Choquette 2011) or road avoidance behavior.

Connectivity between the active season (summer) habitat and inactive season (winter) habitat is crucial for population sustainability. Similarly, when temperatures shift, the snakes must have the unimpeded ability to either access or retreat to a particular (summer or winter) habitat.

Habitat Requirements for Successful Reproduction
Male EMR may exhibit prolonged periods of mate searching, longer daily movements, and defensive female polygyny during the mating season (Jellen 2005, Johnson 2000). Males may use chemical cues to simultaneously trail and pursue individual females during the mating season (Johnson 1989). Because mature male EMRs often occur in higher numbers than receptive females, competition for mates can be intense.

Thermoregulation is so important to gravid female EMR that they spend the majority of the gestation period within open-canopy areas (Reinert and Kodrich 1982). This type of habitat has significantly higher mean soil temperature than early- to mid-successional wetlands (Foster et al. 2009). Depending on the location of the population, gestation habitat of gravid female EMRs could be rock outcroppings, open grassland, shoreline, sedge meadow, barrens, or any suitable land characteristic that provides the snake the ability to thermoregulate and avoid predators.

Usually, gravid females will remain near their winter hibernacula until parturition in late July or early August and then move to other foraging locations (Marshall et al. 2006, Johnson 1995). Foster et al. (2009) identified "the importance of accessible early/mid-successional upland areas adjacent to wetlands for the reproductive success of S.c. catenatus. This vegetation type apparently provides gravid females with favorable thermal conditions, which ultimately may enhance S.c. catenatus productivity." Local gestation sites may be used by several females in a given season and appear to be used by the same individuals in successive breeding years. While at their chosen gestation sites, gravid female snakes generally engage exclusively in basking behavior, forfeiting opportunities for other essential behaviors such as feeding (Keenlyne and Beer 1973, Marshall et al. 2006, Weatherhead and Prior 1992). Since gravid females feed very little, if at all, it appears that they maintain themselves on reserved body energy (fat) throughout their pregnancies (Keenlyne and Beer 1973). In the fall, gravid females continue to

thermoregulate more than males or non-gravid female snakes, despite giving birth in late summer (Harvey and Weatherhead 2011).

Rangewide distribution and abundance
The EMR historically occupied sections of western New York, western Pennsylvania, southeastern Ontario, the upper and lower peninsulas of Michigan, the northern two-thirds of Ohio and Indiana, the northern three-quarters of Illinois, the southern half of Wisconsin, extreme southeast Minnesota, east central Missouri, and the eastern third of Iowa. The limits of the current range of the EMR are similar to the historical range; however, the geographic distribution of extant localities has been restricted by the loss of the populations from much of the area within the boundaries of that range (Szymanski et al. 2016) (Figure 4).

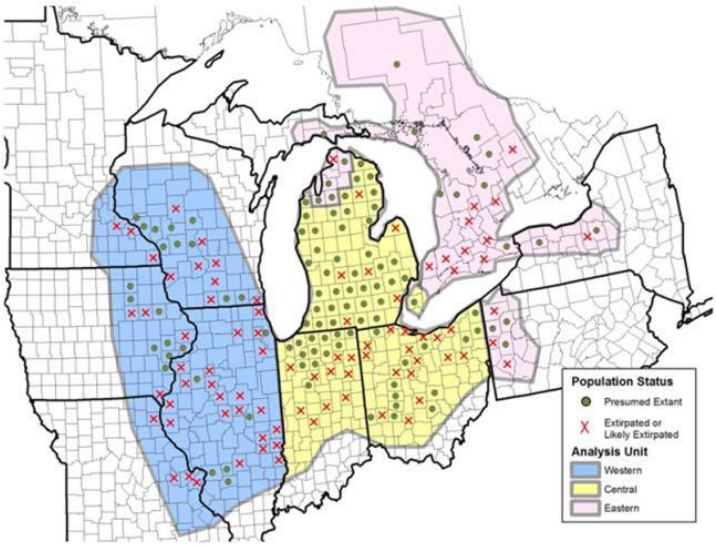

Figure 4. The geographical distribution of presumed extant (extant and unknown status) and extirpated EMR populations over the entire range and within each analysis unit (Szymanski et al. 2016). Green dots represent presumed extant EMR populations. Red Xs represents extirpated or likely extirpated EMR populations.

2.2 Threats

The most prominent threats include habitat loss and fragmentation through development and vegetative succession; mortality of individuals as a result of roads, hydrologic alteration resulting in drought or flooding; persecution; collection; and post-emergent prescribed fire, mowing, and disking. Disease is a relatively recent threat with still unknown consequences. The effects of threats on extinction risk to EMR populations were included in model evaluations by Faust et al. (2011), while the Species Status Assessment (Szymanski et al., 2016) considered the total number of sites range wide where specific threats were reported.

Habitat Loss and fragmentation
The effects of past, widespread wetland loss continue to impact EMR populations. Development and agricultural practices continue to cause habitat loss, although to a lesser degree than in the past. Habitat loss increases the distance between populations and can isolate seasonally used

habitats within individual populations, can restrict gene flow, and other effects of small population dynamics, as well as increase exposure to sources of mortality.

In addition, urban encroachment has disrupted the natural disturbance processes (such as hydrological cycles and fire frequency), and subsequently, changes in habitat structure and vegetative composition have occurred. Prolonged flood conditions may make wetlands too deep for use by EMR, while prolonged drought conditions may affect crayfish populations and thus reduce the number of suitable hibernacula (crayfish burrows) available for EMR.

Vegetative Succession
Woody succession, especially by introduced species such as Eurasian buckthorn, that results in EMR's preferred gramminoid-dominated habitat (grasses, sedges, and rushes) becoming too shaded may reduce or eliminate these sites as suitable places for EMR to bask and thermoregulate. Unmanaged succession is now the most common risk factor, with 75 percent of the sites being impacted range-wide.

Post-emergent land management practices (prescribed fire, mowing, and disking)
The dependence of EMR on early- to mid-successional stage gramminoid-dominated plant communities necessitates that these communities be managed in a manner that controls woody species from dominating them. One of the most commonly used management techniques for this is prescribed fire, since it is a relatively inexpensive technique and mimics the natural fire processes that would have regulated these plant communities prior to European settlement. However, although EMR likely evolved in these fire-dependent communities, direct mortality of EMR can result from exposure to fire if burning occurs when the snakes are out of their hibernacula (post-emergent fire) (Cross 2009, Cross et al. 2015, Dreslik 2005, Dreslik et al. 2011 in Szymanski et al. 2016). In Missouri, Durbian (2006) observed the mortality of eight western massasauga rattlesnakes on a 16.6 ha (41 ac) prairie after a burn conducted on April 18, 2000 (in Szymanski et al. 2016).

Mowing is another strategy, often used in conjunction with prescribed burning, to control woody vegetation and invasive species encroachment. Durbian and Lenhoff (2004) postulated that preburn mowing may potentially reduce fire-related mortality of EMRs and other snake species by negatively modifying the occupied habitat forcing the snakes to leave the area or seek refuge below ground. Durbian (2006) subsequently found that pre-burn mowing at a height of 20 cm (8 in) resulted in the direct mortality of three of seven radio-marked EMRs (in Szymanski et al. 2016). After the burn, three unmarked individuals in the burned area were killed by the fire itself indicating that a number of EMRs did not leave the site after mowing as hypothesized by Durbian and Lenhoff (2004 in Szymanski et al. 2016). Durbian (2006) concluded that mowing prior to burning results in additional direct mortality to EMRs beyond that incurred by prescribed burning and advises to conduct burns while EMRs are hibernating until methods that effectively reduce mortality while achieving the treatment objectives are identified (Durbian 2006 in Szymanski et al. 2016).

Road Mortality
EMR are more sedentary than other snakes and they also move more slowly which increases the probability of being killed while crossing roads (Andrews and Gibbons 2005).

Hydrologic alteration resulting in drought or artificial flooding
Individual populations of EMR often occur in riparian areas, wet prairies, or other places that are prone to fluctuations in hydrology. While EMRs are to a degree adapted to natural hydrological fluctuation, altered flood and drought cycles, or naturally occurring floods and droughts can have effects on EMR or the burrowing crayfish they rely upon for hibernacula. Prolonged flood conditions in a Missouri population of the western massasauga (*Sistrurus tergeminus*) led to changes in population and reproductive characteristics as well as an immediate effect on body condition (Seigel et al., 1999). Conversely, prolonged drought or drawdown conditions may affect water table and burrowing crayfish populations and thus reduce the number of suitable hibernacula (crayfish burrows) available for EMR.

Persecution / Collection
Persecution and collection of EMR are documented threats (Szymanski et al. 2016), with several populations having been collected beyond a recoverable threshold. Generally, people have a negative view of snakes and snake encounters frequently result in snake mortality. Poaching and the illegal collection of snakes for the pet trade is also a factor that contributes to the species decline. In Wisconsin, illegal collecting has been documented despite many years of legal protection (Christiansen 1993, Wisconsin Department of Natural Resources 2011). An Indiana Department of Natural Resources law enforcement investigation in 1998 uncovered a well-organized, multi-state effort to launder State protected reptile species (including EMR). The investigation concluded with the indictment of 40 defendants.

3. ENVIRONMENTAL BASELINE

The Environmental Baseline 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. The environmental baseline is a "snapshot" of a species' health at a specified point in time. It does not include the effects of the action under review in the consultation.

The Corps has stated their authority is limited to their permit and easement areas; however, this consultation is for the entire project area for the Meteor Timber Processing Plant and Rail Facility.

3.1 Action Area

Action area, as defined by the ESA's implementing regulations (50 CFR 402.02), 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 (our emphasis). Action is defined in the regulations as "…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. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air.

The action area (AK Knapp Rail Slope Intercept) is approximately 134.2 acres (Figure 1). As described in Section 1.1 of the BA, at least 50 percent of the Project area has been conservatively

estimated to fall under Corps jurisdiction (i.e. proximate to wetlands and waters of the U.S.). It is recognized that the Corps' action is applicable only to construction of the Project, and not the long-term operation and maintenance of the Project.

3.2 Status of the Species in the Action Area

No formal surveys for EMR were conducted to determine the presence in the action area, but the last recorded observation within the proposed action area was in 1998. A photo-verified record of an adult EMR was received by WDNR in June 2016 from a hydrologically-connected wetland approximately two miles to the north. Stantec completed a habitat assessment of the action area on April 14, 2016 and concluded that 21.5 acres of the site contains low suitability habitat for the eastern massasauga. Further evaluation of this assessment and the site was conducted by WDNR with the determination that the 21.5 acres should be considered moderate suitability for the species. In the absence of survey data, however, we assume that all wetland and adjacent open upland habitat identified as suitable for eastern massasauga within the action area are occupied by the species, regardless of the habitat quality rating. Approximately 21.61 acres of closed canopy upland and wetland forest will be cleared as a result of this project as well as the dewatering and restoration of approximately 28.96 acres of cranberry beds that will provide suitable habitat for the species in the future.

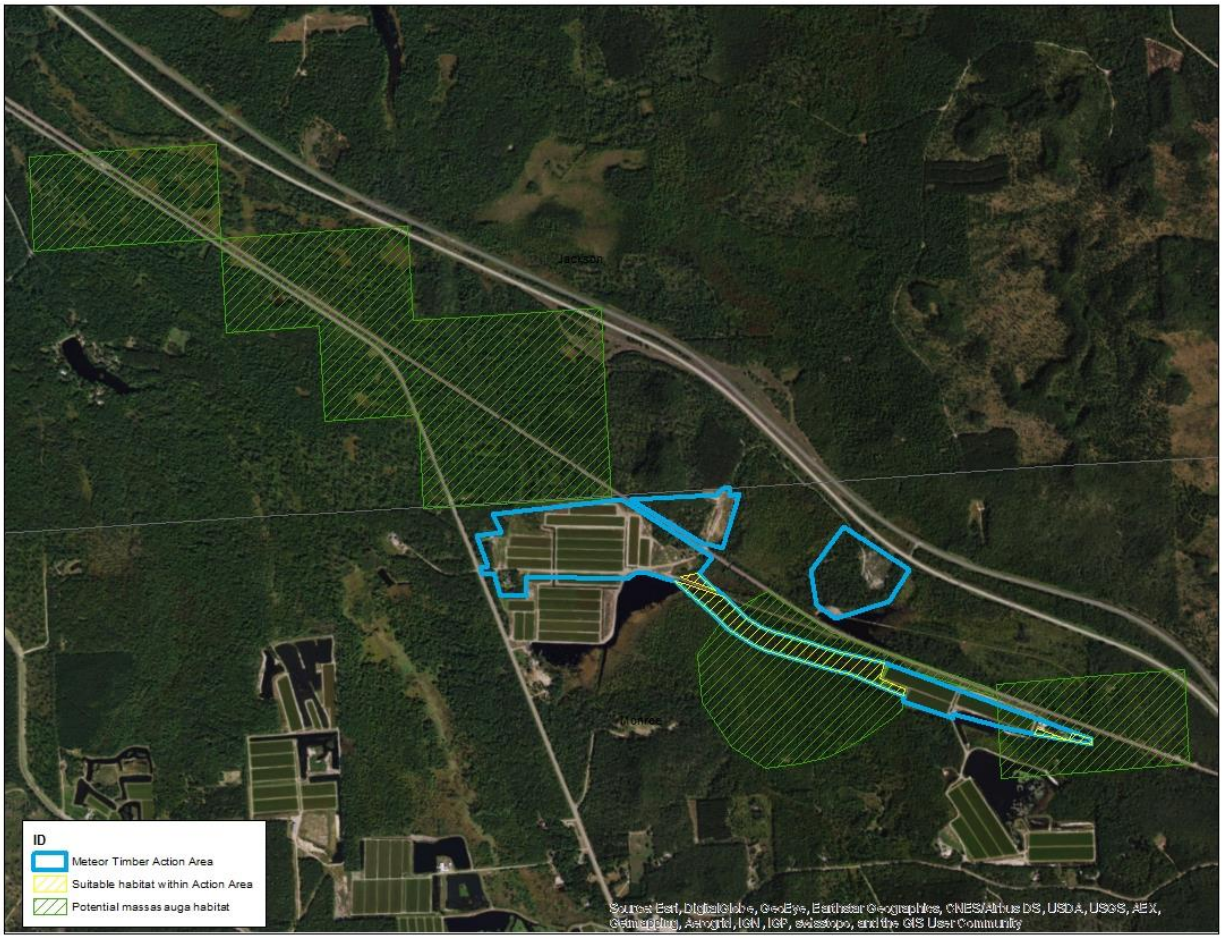

Figure 5. Generalized habitat for eastern massasauga near and within Project action area

4. EFFECTS OF THE ACTION

Effects of the action are defined as "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline" (50 CFR §402.02). Direct effects are defined as the direct or immediate effects of the action on the species or its habitat. Direct effects result from the agency action, including the effects of interrelated and interdependent actions. Indirect effects are caused by or result from the agency action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the immediate footprint of the action area, but would occur within the action area as defined.

The following information addresses factors affecting eastern massasauga, with factors specific to the individual species identified where appropriate. The BA indicated that the area for direct and indirect effects analyses is approximately 134.2 acres.

Considering the environmental baseline and the additional effects that may be caused by the construction and operation of the Meteor Timber LLC Rail Site Project, we believe that loss of habitat, reduced habitat effectiveness, and likelihood the species will be present in the action area represent an adverse effect to eastern massasauga.

4.1 Factors Considered

This section includes an analysis of the direct and indirect effects of the proposed action on the species and critical habitat and its interrelated and interdependent activities. Our analysis of the effect of the Project considers the following factors:

- Proximity of the action - The proposed action will affect suitable habitat of EMR within and in close proximity of occupied areas. EMR is assumed present and is likely to occur within the Meteor Timber LLC Rail Site action area.
- Distribution - The Action Area includes a small fraction of the range of EMR. It is expected that the greatest impact will be from harassment if encountered during the relocation effort.
- Timing - The construction of the Project has the potential to affect all life stages for the EMR. Construction in EMR suitable habitat areas is anticipated to occur during the active season (April 1 to November 15). Operation and maintenance activities can occur at any time over the life of the project.
- Nature of the effect - Direct and indirect effects of the Project are described below. It is likely that the proposed construction and relocation actions will have a variety of effects on EMR, however, mortality is anticipated to be low.
- Disturbance severity - The intensity and severity of the disturbance is described below.

Proximity of the action

The proposed action is located in a mapped area for EMR that is based on a 1998 recorded observation. No recent, exhaustive surveys have been conducted in the proposed impact area, however massasauga was found approximately two miles from the proposed impact area in a hydrologically connected wetland. Due to the occurrence of historical observations and suitable

habitat for EMR and lack of quantitative survey data available for the impact area, we assume that the EMR is present where suitable habitat has been identified (see the section, Environmental Baseline).

Distribution
Direct impacts to EMR and its habitat will most likely occur within the action area. Lower quality habitat was observed within a portion of the action area and is considered occupied because it retains some level of suitability. A total of 21.5 acres of suitable habitat will be impacted during the vegetation clearing and construction phase. Translocation efforts for massasauga may occur during construction if individuals are identified in the impact area. It is difficult to find all massasauga in a proposed action area, so snakes not found and relocated prior to construction activities may experience mortality (crushing or collision) or harassment (disturbance) during construction activities; however, we believe the likelihood of mortality will be greatly reduced during the active season through the use of exclusion fencing and a biological monitor.

Timing
The proposed action can be divided into two periods: the construction phase (vegetation clearing and construction) and the operation phase (rail traffic and disturbance).

During the active season (spring through early summer), males and nongravid females tend to move from their hibernacula into upland and structurally complex vegetation communities for foraging, and often, courtship and mating. Habitat generally consists of thermoregulatory or basking sites, retreat sites, and foraging sites. Portions of the construction and operation phases are likely to occur during this sensitive period; however, the species should be more mobile to avoid lethal impacts and will be more visible so that the presence of a biological monitor during construction activities can assist with translocating individuals out of the action area.

During the inactive season (winter), eastern massasauga hibernate either singly or in small groups or clusters and require a suitable hibernation site in wet habitat types that include crayfish burrows, mammal burrows, rocky crevices, rodent holes, hummocks, old stumps, rotten logs, and tree and shrub root systems. Because of their preference to return to the same hibernacula, the snakes become highly concentrated from the time they return to a hibernation area until the time they disperse in the spring.

Nature of the effect
Direct impacts to the eastern massasauga from construction are anticipated and are described in the BA on Page 8 and from supplemental materials provided by Stantec. To minimize lethal effects, an environmental monitor, exclusion fencing, and translocation will be utilized during the species' active season (April to November). Moving eastern massasauga out of the action area or limiting movement from exclusion fencing may disrupt normal behavior patterns and lead to harassment. EMR remaining within the action area may be killed from direct physical impact (collision or crushing) during vegetation clearing and construction.

Disturbance severity:
Disturbance severity is anticipated to be relatively low given the short construction time frame and long-term mitigation of protected habitat and wildlife friendly corridors. The primary form of disturbance is expected to be in the form of harassment if eastern massasauga are encountered and moved outside of the action area, although mortality may occur of any individuals missed by the environmental monitor surveys.

4.2 Analyses for Effects of the Action

Measuring impacts on eastern massasauga is problematic in nature. The effects analysis and mitigation strategies under consideration for the eastern massasauga are discussed below.

	Loss (Development)	**Gain (Conservation Easement)**
Suitable EMR Habitat	21.50	145.35 (managed for EMR)
Unsuitable EMR Habitat	112.70	266.65
TOTAL:	134.2 (action area)	412.00

Table 1. Generalized habitat availability for EMR near and within Project action area

Beneficial Effects

Beneficial effects have been identified or are expected to occur for EMR as a result of this project. A conservation easement totaling 412 acres of the project site will be created and will consist of 145 acres managed directly for the benefit of EMR. Area A is situated in the southeast corner of the Project property and is approximately 75 acres and Area B is located in the northeast corner of the Project property covering approximately 70 acres. Tree clearing, limiting the growth of new forest cover, and restoring wetland and grassland habitat will likely provide suitable summer habitat that will connect areas of suitable massasauga habitat.

Direct Effects

Construction of the Project could directly affect the eastern massasauga in a variety of ways. Depending on the timing of construction, eastern massasauga could be subjected to mortality, harm or harassment at underground hibernacula sites or within preferred habitats during the active season. It is anticipated that vegetation clearing will be conducted within suitable EMR habitat during the active season of April to Mid-November unless the area has been previously fenced and snake removal surveys have been performed during the active season. The 21.5-acre impact area spans across three potential suitable habitat areas for EMR that are connected hydrologically (Figure 5). EMRs within the 21.5-acre area are likely to be affected by construction activities and/or translocation efforts. The primary effect to the species is anticipated to be harassment from disturbance caused by vegetation clearing, and if observed on site, physical relocation using snake tongs by a qualified biological monitor to outside of the action area. Any EMR captured and translocated will be harassed and could be injured or killed by handling; however, since leaving the snake in a construction zone presents a hazard to human health or safety, moving an individual to the nearest/most immediately adjacent habitat (within 200m of point of capture) does not require a permit and is not considered prohibited incidental take (USFWS, 2017). During construction, exclusion fencing will be used to keep EMR out of

the action area and from being further harmed or harassed. This will result in temporary impacts to the species until connectivity is restored, but this is anticipated to significantly affect individuals adjacent to the action area. Once construction is complete, exclusion fencing will be used to focus movement of EMR through wildlife corridors to allow for safe movement and connectivity to other habitat areas.

Any eastern massasauga missed by the on-site biological monitor may be killed, harmed or harassed. Mortality may occur from collision with vehicles and/or construction equipment during the active season or by crushing if individuals are located underground during the proposed construction. The risk of mortality is anticipated to be greatly reduced during the active season when EMR are not anticipated to be concealed underground. Furthermore, it is anticipated that all individuals will be found due to the frequency of surveys, limited vegetation left within the action area prior to construction, and use of cover boards to concentrate any snakes still within the exclusion fencing. Damage to any impacted burrow is anticipated to be reduced by using construction matting within wetland habitats. With these measures in place direct harm and/or mortality of EMR is expected to be minimal to nonexistent.

No recent quantitative EMR surveys are available for the action area and an approximate density of individuals within the action area cannot be determined. Known populations and potential suitable habitat for EMR in Wisconsin understudied when compared to other parts of the species' range. Population densities, when reported, have ranged from 0.56 to 3.78 individuals per hectare (Szymanski, 1998). It is anticipated that EMR density within the Project action area is low based on the quality of the habitat being impacted and because so few individuals have been reported.

Within the 134.2-acre action area, 21.5 acres of low to moderate quality wetland and adjacent open upland habitat for EMR will be permanently developed by this this project. This loss of habitat will be a linear impact across 1.2 miles and existing suitable EMR habitat on either side will remain connected through the use of four lighted wildlife underpasses, as well as open-top channels between railroad ties for the purpose of providing safe passage to all remaining suitable habitat. These efforts will help ensure that large amounts of unaffected habitat remain available within the home range of the species. This habitat consists of approximately 196 acres intersecting the project area and an additional 358 acres adjacent and to the north of the project property that is connected hydrologically. Of the approximate 554 acres of available suitable EMR habitat, 3.88 percent will be developed and permanently lost. EMR may be affected by the immediate loss of suitable habitat; however, the impacts to suitable wetland habitats are anticipated to be distributed along lower quality habitat within a narrow linear corridor.

The project property will continue to provide habitat conditions suitable for EMR during construction as well as additional habitat once the conservation easements specific to EMR are restored. There will be continued potential for direct take of the species during restoration activities but mortality is anticipated to be significantly reduced or avoided through the use of a biological monitor and other measures described in Appendix A. Restoration actions are unlikely to have appreciable impact on the population that inhabits the action area. Thus, no component of the proposed action is expected to reduce the reproduction, numbers, or distribution of the EMR rangewide. Therefore, we do not anticipate a reduction in the likelihood of both survival and recovery of the species as a whole.

In summary, the risk of EMR mortality is anticipated to be low given the timing of vegetation clearing, use of exclusion fencing and biological monitors, and the increased probability of detecting all individuals during multiple surveys in the active season within an area of limited vegetation. Any massasauga missed during the multiple rounds of surveys may be harmed or killed. The loss of 3.88 percent of available habitat will impact any massasauga that utilize the 21.5 acres of habitat proposed for developed but connectivity to existing habitat will be restored once construction is complete. EMRs that were relocated and those directly adjacent to the action area will be impacted during construction in the form of temporary disturbance/harassment, but available habitat is not limiting and access will be restored to all potential habitat areas. It is anticipated that EMR will avoid the perimeter of the work space until construction is complete and will have sufficient available habitat until connectivity is restored. In addition, the conservation easement proposed will provide long-term stability and protection to the site and 145.35 acres of habitat will be managed to offset the loss of the 21.5acres of low- to moderate-quality habitat. As a result, we conclude that the overall habitat suitability or availability for eastern massasauga within the action area should be minimally affected by proposed Project actions.

Interrelated and interdependent actions
No interrelated and interdependent actions have been identified for this project

Indirect Effects
Indirect effects from the project will result in increased rail traffic along the existing Union Pacific Railway main line, thereby impacting eastern massasauga from harassment and may increase mortality risk from collision. Rail traffic is currently a disturbance factor on the site and this project is anticipated to increase traffic by two trains per week. This increase, however, is not anticipated to substantially increase mortality or disturbance of individuals as the trains are moving at low speeds and massasauga tend to avoid basking near the rails (Paloski pers. Comm.). During the inactive season, EMR would be below ground, away from rail disturbance and we do not anticipate any significant impacts to the species during this time period.

5. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. At this time we are unaware of any new private actions anticipated to occur within the Action Areas, so no significant cumulative effects are anticipated.

6. CONCLUSION

After reviewing the current status of the eastern massasauga, the environmental baseline for the action area, the effects of the proposed Project and the cumulative effects, it is the Service's biological opinion that the construction of the Meteor Timber Processing Plant and Rail Facility, as proposed, is not likely to jeopardize the continued existence of the proposed species. No critical habitat has been designated for these species; therefore, none will be affected.

The action is likely to kill, harm or harass eastern massasauga in the project area; however a definite number cannot be determined with any certainty. In order to stay conservative and error on the side of the species, EMR population density at this site is assumed to be 0.56 per hectare (ha). Within the 21.5 acres (8.7 ha) of habitat being developed, we would anticipate 4.87 individuals to be present. Proposed conservation measures are anticipated to significantly reduce the risk of mortality and effects on local eastern massasauga reproduction and abundance will be short-lived. The full extent of the occupied habitat impacted by this project is not anticipated to exceed 21.5 acres within the action area, and the estimated total available occupied habitat is greater than 550 acres. Therefore, we expect a reduction of 3.88 percent available habitat in the project vicinity in the short-term. With the establishment of EMR specific conservation easement in the action area of 145.35 acres, we anticipate there will be a net gain of 22.35 percent of suitable habitat once management actions are complete. The temporary loss of habitat is not anticipated to significantly affect the species, and wildlife corridors will be maintained to facility connectivity to other available habitats. In addition, 266.65 acres of additional habitat will be included in the conservation easement that will prevent further disturbance and development near the available habitat for EMR. Finally, the action will have no or little effect on the status of the species in Wisconsin and on its rangewide reproduction, numbers, and distribution.

7. INCIDENTAL TAKE STATEMENT

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

7.1 AMOUNT OR EXTENT OF THE TAKE

We relied on the following assumptions to estimate anticipated incidental take:

- For eastern massasauga, given the difficulty in estimating number of individuals, all individuals that may exist in the 21.5-acre action area may be incidentally taken as the result of the loss of habitat or from direct mortality if they are missed during active season monitoring and subsequently killed by construction or operation activities.
- The primary form of take to individuals will be in the form of harassment during construction while movement is temporarily impeded.
- Density of EMR within the action area is anticipated to be low (0.86/ha) based on the assessed quality of habitat and because only two individuals have been reported over a 20-year period. This would lead us to believe that up to five individuals may be taken as a result of this Project.

If EMR are present or utilize an area proposed for construction in suitable wetland or upland communities, incidental take of eastern massasauga could occur. The Service anticipates incidental take of the eastern massasauga will be difficult to detect for the following reasons: (1) the individuals during the active season are cryptic and may be widely dispersed in summer habitats where they are difficult to find; (2) the precise distribution and density of the species within its summer or winter habitats in the action area are unknown but anticipated to be low; and (3) in many cases incidental take will be non-lethal or undetectable.

The Service anticipates that no more than 21.5 acres of potential eastern massasauga habitat will be disturbed to the point that take will occur from project construction or ongoing activities during the life of this project. All take is anticipated to occur in the forms of mortality, harm, or harassment. Lethal take is anticipated to be less than, or up to five (5) eastern massasauga within the action area.

7.2 EFFECTS OF THE TAKE

In the accompanying biological opinion, the Service determined the proposed action's anticipated take is not likely to result in jeopardy to the species when the reasonable and prudent measures are implemented.

7.3 REASONABLE AND PRUDENT MEASURES

The measures described below are non-discretionary, and must be implemented by the agency as binding conditions of any authorization issued to the applicant, as appropriate, in order for the exemption in Section 7(o)(2) to apply. The Corps has a continuing duty to implement the activity covered by this incidental take statement. If the Corps (1) fails to require Meteor adherence to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the eastern massasauga:

1. Follow the conservation measures for eastern massasauga outlined in the Wisconsin Department of Natural Resources Incidental Take Permit – Conservation Plan for eastern massasauga rattlesnake and the Meteor Timber LLC Rail Site Project.
2. Document and report to the Service all verified eastern massasauga sightings or any known mortality within the action area during the proposed construction.

7.4 TERMS AND CONDITIONS

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

1. Follow the conservation measures for eastern massasauga outlined in the Wisconsin Department of Natural Resources Incidental Take Permit – Conservation Plan for eastern massasauga rattlesnake and the Meteor Timber LLC Rail Site Project.

    1.1 Conservation measures shall be followed for all suitable eastern massasauga habitat and conservation easement areas identified by this project as described in Appendix A, or latest revised version.

2. Sighting reports for eastern massasauga should be provided to the Service within 48 hours of observation. Our office should be notified immediately of any eastern massasauga mortality that is attributed to the Project actions. Notification may be by phone at 952-252-0092 (extension 208)or email at *andrew_horton@fws.gov.*

The reasonable and prudent measures, with implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these reasonable and prudent measures, the Service believes that no more than five massasauga will be incidentally taken. In addition, the Service anticipates that no more than 21.5 acres of suitable EMR wetland and adjacent open upland habitat will be removed as a result of the proposed actions. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Reporting Requirements

Federal agencies have a continuing duty to monitor the impacts of incidental take resulting from their activities [50 CFR 402.14(i)(3)]. In doing so, the Federal agency must report the progress of the action and its impact on the species to the Service as specified below.

1. The Corps or Meteor shall notify the project designated Minnesota-Wisconsin Field Office biologist (Andrew Horton at 952-252-0092 (extension 208) or *andrew_horton@fws.gov*) when project construction is initiated and when habitat connectivity by use of wildlife corridors has been restored.
2. The Corps or Meteor shall provide to the Service a report no later than January 31 of the year after project construction, that specifies the progress and results of implementing the Reasonable and Prudent Measure and its terms and conditions and any report required therein.
3. The Corps or Meteor shall provide to the Service an update no later than January 31 for each year of ongoing project maintenance priori to long-term management that specifies the progress and results of implementing the Reasonable and Prudent Measure and its terms and conditions and any report required therein.

This annual report shall be submitted to Field Supervisor, U.S. Fish and Wildlife Service, 4101 American Boulevard East, Bloomington, Minnesota, 55425-1665.

8. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act, directs Federal agencies to utilize their authorities to further the purposes of the Act 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 programs, or to develop information. In addition to the conservation measures already incorporated into the action, we have no additional recommendations.

9. REINITIATION NOTICE

This concludes formal consultation on the proposed Meteor Timber Processing Plant and Rail Facility located in Monroe County, Wisconsin. 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 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.

LITERATURE CITED

Beltz, E. 1993. Distribution and status of the eastern massasauga rattlesnake, *Sistrurus catenatus catenatus* (Rafinesque, 1818), in the United States and Canada. Pp. 26-31, In: Johnson, B., and V. Menzies (Eds.), International symposium and workshop on the conservation of the eastern massasauga rattlesnake, *Sistrurus catenatus catenatus*. Metro Toronto Zoo.

DeGregorio, B.A., 2008. Response of the eastern massasauga rattlesnake (*Sistrurus c. catenatus*) to clearcutting. MS Thesis, Purdue University, Ft. Wayne, Indiana. 61 p.

DeGregorio, B.A., B.J. Putnam, and B.A. Kingsbury. 2011. Which habitat model is most applicable to snakes? Case studies of the eastern massasauga (*Sistrurus catenatus*) and eastern fox snake (*Pantherophis gloydi*). Herpetological Conservation and Biology 6: 372–382.

Dreslik, M.J. 2005. Ecology of the eastern massasauga (*Sistrurus catenatus catenatus*) from Carlyle Lake, Clinton County, Illinois. Ph.D. Dissertation, University of Illinois at Urbana Champaign. 353pp.

Evans, P.D., and H.K. Gloyd. 1948. The subspecies of the massasauga, *Sistrurus catenatus*, in Missouri. Bulletin of the Chicago Academy of Sciences 8(9): 225-232.

Gibbs, H.L., L. Sanz, and J. Calvete. 2009. Snake population venomics: proteomics-based analyses of individual variation reveals significant gene regulation effects on venom protein expression in Sistrurus rattlesnakes. Journal of Molecular Evolution. 68: 113-125.

Harvey, D.S., and P.J. Weatherhead. 2006. A test of the hierarchical model of habitat selection using eastern massasauga rattlesnakes (*Sistrurus c. catenatus*). Biological Conservation 130: 206-216.

Johnson, G. 1995. Spatial ecology, habitat preferences, and habitat management of the eastern massasauga, *Sistrurus c. catenatus*, in a New York transition peatland. Ph.D. Dissertation, State University of New York, Syracuse, New York. xvii + 140 p.

Johnson, G. 2000. Spatial ecology of the eastern massasauga (Sistrurus c. catenatus) in a New York peatland. Journal of Herpetology 34: 186-192.

Johnson, G., and D.J. Leopold. 1998. Habitat management for the eastern massasauga in a central New York peatland. Journal of Wildlife Management 62: 84-97.

Kingsbury, B.A., J.C. Marshall, and J. Manning. 2003. Activity patterns and spatial resource selection of the eastern massasauga rattlesnake in northeastern Indiana. Unpublished report, Indiana-Purdue University, Ft. Wayne, Indiana. 24 p.

Kingsbury, B.A. 2002. R9 conservation approach for the eastern massasauga (*Sistrurus c. catenatus*) on the Huron-Manistee National Forests. Unpublished report (to the United States Forest Service), Indiana-Purdue University, Ft. Wayne, Indiana. 71 p.

Kubatko, L.S., H.L. Gibbs, and E.W. Bloomquist. 2011. Inferring species-level phylogenies and taxonomic distinctiveness using multilocus data in Sistrurus rattlesnakes. Systematic Biology 60:393-409.

Lipps, G.J. 2008. Survey of the eastern massasauga in northeastern Ohio. Unpublished report (to the Ohio Division of Wildlife), Gregory Lipps LLC. 23 p.

Marshall, J.C., J. Manning, and B. Kingsbury. 2006. Movement and macrohabitat selection of the eastern massasauga in fen habitat. Herpetologica 62: 141-150.

Mauger, D., and T.P. Wilson.1999. Population characteristics and seasonal activity of *Sistrurus catenatus catenatus* in Will County, Illinois: Implications for management and monitoring. Pp. 110-124, In: Johnson, B., and M. Wright (Eds.), Second International symposium and workshop on the conservation of the eastern massasauga rattlesnake, *Sistrurus catenatus catenatus*: population and habitat management issues in urban, bog, prairie, and forested ecosystems. Toronto Zoo.

McCumber, E. and R. Hay. 2003. Eastern massasauga rattlesnake status survey and telemetry study lower Chippewa River, Buffalo Co., Wi. Unpublished report (to USFWS), Wisconsin Department of Natural Resources. 7 p.

Moore, J.A., and J.C. Gillingham. 2006. Spatial ecology and multi-scale habitat selection by a threatened rattlesnake: the eastern massasauga (Sistrurus catenatus catenatus). Copeia 2006: 742–751.

Reinert, H.K. 1978. The ecology and morphological variation of the massasauga rattlesnake, *Sistrurus catenatus*. MS Thesis, Clarion State College, Clarion, Pennsylvania. 173 p.

Reinert, H.K., and W.R. Kodrich. 1982. Movements and Habitat Utilization by the Massasauga, *Sistrurus catenatus catenatus*. Journal of Herpetology 16: 162-171.

Sage, J.R. 2005. Spatial ecology, habitat utilization, and hibernation ecology of the eastern massasauga (*Sistrurus catenatus catenatus*) in a disturbed landscape. MS Thesis, Purdue University, Ft. Wayne, Indiana. 93 p.

Seigel, R. A. 1986. Ecology and conservation of an endangered rattlesnake, *Sistrurus catenatus*, in Missouri, USA. Biological Conservation 35:333–346.

Smith, C.S. 2009. Hibernation of the Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) in Northern Michigan. MS Thesis, Purdue University, Ft. Wayne, Indiana. 44 p.

Szymanski, J. A. 1998. Status assessment for the eastern massasauga (*Sistrurus c. catenatus*). U.S. Fish and Wildlife Service, Fort Snelling, MN. 19 pp + apps.

U.S. Army Corps of Engineers 2016. Biological Assessment for the Meteor Timber Processing Plant and Rail Facility. St. Paul District, MN. 30 p.

U.S. Fish and Wildlife Service. 2015. Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Eastern Massasauga Rattlesnake. Fed. Reg. 80: 58688-58701.

U.S. Fish and Wildlife Service. 2016. Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted From Take Prohibitions. Midwest Regional Office, MN.

U.S. Fish and Wildlife Service. 2017. Section 7 Programmatic Consultation on Issuance of Section 10(a)(1(A) Scientific Take Permits and Providing Funding Pursuant to Endangered Species Grants for the Eastern Massasauga Rattlesnake (*Sistrurus catenatus*). Chicago Ecological Services Field Office, IL.

Weatherhead, P.J., and K.A. Prior. 1992. Preliminary observations of habitat use and movements of the eastern massasauga rattlesnake (*Sistrurus c. catenatus*). Journal of Herpetology 26: 447-452.

Wright, B.A. 1941. Habit and habitat studies of the massasauga rattlesnake (*Sistrurus catenatus catenatus Raf.*) in Northeastern Illinois. American Midland Naturalist 25: 659-672.