Detroit Edison

Fermi 3 Construction

Habitat and Species Conservation Plan Eastern Fox Snake (*Elaphe gloydi*)

March 2012, Revision 1

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The eastern fox snake (*Elaphe gloydi*) is a threatened species in Michigan with four known isolated populations remaining in Southeastern Michigan. Two of these populations occur in Monroe County along the shores of Lake Erie (Reference 8.1). It is known that Detroit Edison's Fermi property has a population of fox snakes. Detroit Edison currently operates one nuclear generating unit on this property and is considering building an additional unit, Fermi 3. The construction of Fermi 3 has the potential to impact the existing fox snake population and its habitat. The site's personnel have an elevated awareness of wildlife habitat and associated wildlife populations as a result of the site's Wildlife Habitat Certification (certified by the Wildlife Habitat Council), functional ISO 14001 certified Environmental Management System and a cooperative agreement with the US Fish and Wildlife Service to manage on-site habitats as part of the Detroit River International Wildlife Refuge. It is the intent of this document to describe measures to be implemented in order to create further employee awareness and decrease impacts on the population of eastern fox snakes and their habitat caused by Fermi 3 construction activities.

1.1 Overview

The construction of Detroit Edison's Fermi 3 Power Plant will involve a significant amount of heavy construction activity. During the course of these construction activities awareness about wildlife and its habitat will need to be discussed during pre-job briefings to help assure that impacts are minimized. The development of an environmental check-list will assist in making construction personnel aware that some activities and the locations in which they are performed may have impacts on wildlife in general and the eastern fox snake in particular. The use of "fox snake" and "snake" refer to the eastern fox snake in this document. Additionally, communicating the behavior, appearance and preferred habitat of the fox snake will promote greater awareness. Undeveloped areas to be impacted will be surveyed by a team of trained personnel to help remove snakes prior to construction activities.

1.2 Regulatory/Legal Framework

The Federal *Endangered Species Act of 1973* (ESA 1973), and the State of Michigan's *Natural Resources and Environmental Protection Act (NREPA), Act 451 of 1994 PART 365* require all parties to include endangered and threatened species protection within project planning. This requires projects to be reviewed by State and/or Federal agencies. This review determines if the project requires an *incidental take permit*, as outlined in ESA 1973. With the application for an incidental take permit a *Habitat Conservation Plan* (HCP) needs to be authored to demonstrate to the agencies that there is a plan in place that reduces the impact on endangered and threatened species. The eastern fox snake is not federal listed species but is listed by the state of Michigan as threatened.

1.3 Plan Area

This plan will cover activities occurring on the Fermi Power Plant site related directly to the construction of the Fermi 3 power plant. Areas utilized by the eastern fox snake throughout its life cycle include shorelines, wetlands and adjacent uplands which are critical habitat for the fox snake (Reference 8.2). These habitats occur throughout the Fermi Power Plant property and the wetlands are outlined in Fig. 1, Appendix A. The Michigan Department of Natural Resources (MDNR) maintains an *Endangered Species Assessment* website (Reference 8.3) for the specific purpose of project planning. This website is used to obtain a coarse overview for project planning and users can get an immediate idea if further review by the MDNR is required for projects. The Fermi Power Plant property is entirely contained within a high priority area for endangered and threatened species as displayed on the MDNR's map of areas with unique natural features (Reference 8.4).

2.0 Environmental Setting/Biological Resources

2.1 Environmental Setting

The Fermi site is on the west shore of Lake Erie at the mouth of Swan Creek, approximately 24 miles northeast of Toledo, Ohio and 30 miles southwest of Detroit, Michigan. The Fermi 3 power plant will be located on the current Fermi site in Frenchtown Township; Monroe County, Michigan at the following coordinates:

Latitude	Longitude
41º 57' 39" North	83º 15' 43" West

Zone 17T UTM (NAD83) Coordinates	
4,647,902 m Northing	312,551 m Easting

The U.S./Canada international border runs through Lake Erie about seven miles east of the Fermi site. The Power Plant and ancillary systems are built primarily on fill materials.

2.1.1 Climate

Bailey's eco-region classification system (Reference 8.5) has been utilized to describe climate, and associated biological interactions, throughout the world. Bailey's eco-region system is widely used by many government and non-government groups to describe climate and associated ecology in project or management areas. The descriptors identifying the eco-region that the Fermi site is located in are as follows:

Baileys Eco-region Classification for Detroit Edison's Fermi Power Plant

Domain	Humid Temperate
Division	Hot Continental
Province	Eastern Broadleaf Forest
Section	Erie and Ontario Lake Plain

2.1.2 Topography/Geology

Fermi Power Plant is situated in the Lake Erie lake plain. The topography at this location is flat and formed both by the physical process of Lake Erie and Swan Creek. Historically this region was part of a vast wetland complex associated with Lake Erie, Swan Creek and in part by the hydrologic processes of the Detroit and Raisin Rivers. Large lake plain deposits of clay and sand dominate the soil types as a result of the post glacial Lake Erie formation.

2.1.3 Hydrology/Streams, Rivers and Drainages

The hydrology of the area is influenced greatly by the physical processes of Lake Erie. Lake Erie has a perfect fetch for seiche activity. With a predominant southwest wind pattern Lake Erie is susceptible to great fluctuations in water levels. This is due to sustained winds pushing the lake water to the east, and then, as the winds subside, the water returns to the west. This creates large waterless expanses followed quickly by water inundating into creek and river mouths resulting in a bath tub like "sloshing" effect. This creates unique opportunities for both plants and wildlife. Other local hydrological conditions are dictated by the Swan Creek.

2.1.4 Vegetation

Vegetation varies throughout the Fermi property. A survey was conducted from 2008 through 2009 and the findings have been detailed in, "Fermi 3 Terrestrial Vegetation Survey, Final Report", November 2009. Numerous land uses preceded the Power Plant including fish farming, residential and recreational. As a result of dikes, filling activity and various other disturbances, many vegetation types are in varying stages of succession.

Undeveloped areas of the site account for 656 acres and are cooperatively managed with USFWS as part of the Detroit River International Wildlife Refuge (DRIWR) Lagoona Beach Unit. The majority of the undeveloped areas are wetlands of various types (e.g., high and low marsh, wet meadow, forested wetland, scrub-shrub wetland, shallow open water, etc.).

2.1.5 Wildlife

The Fermi site has been a certified wildlife habitat site through the Wildlife Habitat Council since 2000. The focus of wildlife habitat certification is to utilize unused lands for the benefit of wildlife. A wildlife survey was conducted on the site from 2008 through 2009 and the results are documented in "Fermi 3 Terrestrial Wildlife Survey, Final Report," September 2009. The survey contains an assessment of the fox snake as follows:

Eastern fox snake (Elaphe gloydi)

State threatened. The eastern fox snake inhabits Great Lakes emergent wetlands, preferring habitats dominated by herbaceous vegetation, such as cattails (*Typha* spp.). Although primarily a wetland species, eastern fox snakes also use drier habitats such as vegetated dunes and beaches, old fields, and open woodlands. They occasionally use disturbed areas such as farm fields, pastures, woodlots, vacant urban lots, rock riprap, ditches, dikes and residential properties. Eastern fox snakes usually are found near water, and are capable of swimming long distances. Specific habitat features required by eastern fox snake are downed woody debris in Great Lakes marshes, lakeplain wet prairie, lakeplain wet-mesic prairie, emergent marsh, open dunes, sand and gravel beach, mesic sand prairie, mesic southern forest and lakeplain oak openings (MNFI, 2007).

Eastern fox snake was observed in wetlands west of Doxy Road by Ducks Unlimited field staff while conducting a wetland delineation of the Fermi site in May and June 2008. The species was not observed during the present study. Portions of habitats used by the snake, principally emergent marsh, would be filled for Fermi 3 construction and some individuals could be accidentally harmed or killed if they do not withdraw from active construction areas. Scheduling of work periods should be timed to coincide with eastern fox snake active periods (as opposed to hibernation) to allow snakes to withdraw from construction areas as needed. If ground disturbing construction work involving potential hibernacula would occur during hibernation periods, it is recommended that a biologist evaluate the work area, including all ingress/egress routes, before any work begins to determine if eastern fox snake or other protected snakes are present. Suitable hibernacula for eastern fox snake generally consist of rock piles or similar structures, including railroad berms and trestle footings. Other features that retain heat from sunlight also could be used by this snake.

Significant marsh and transitional habitat would remain intact post-construction and it is expected that the eastern fox snake population within the Fermi site would persist. A site operational management plan that includes provisions to protect eastern fox snake habitat after construction will be implemented. Based on the available information, no significant impacts are anticipated. However, available information regarding eastern fox snake habitat requirements is sketchy and as new information becomes available, the potential for impacts should be re-evaluated. Further consultation with MDNR is recommended before construction begins.

2.1.6 Existing Land Use

The Fermi site is 1,260 acres in area of which 656 acres are undeveloped. The remaining 604 acres is used for a variety of purposes including the Fermi 2 power plant, office buildings, parking lots and maintenance buildings. Permanent impacts resulting from the construction of the Fermi 3 power plant will occur primarily on already developed or highly disturbed areas. A minimal amount of undeveloped land will be permanently impacted and those areas containing wetlands will be mitigated appropriately. A mitigation plan titled, “Fermi 3 Conceptual Aquatic Resource Mitigation Strategy August 2011,” was submitted to the Michigan Department of Environmental Quality (MDEQ) on August 25, 2011, as part of the Fermi 3 Joint Permit Application. Wetland permit 10-58-0011-P was issued for Fermi 3 on January 24, 2012. As part of the conditions of this permit, a finalized mitigation plan acceptable to the MDEQ will be completed within 6 months of the permit issuance date.

2.2 Species of Concern in Plan Area

The studies which were performed to investigate the terrestrial and aquatic ecology had a particular focus on protected species within the Fermi 3 area of potential effect (APE). In addition to the eastern fox snake a wide range of species were identified as having the potential to utilize the Fermi site. Additional information on these species can be found in these survey reports: “Fermi 3 Terrestrial Vegetation Survey, Final Report,” November 2009, “Fermi 3 Terrestrial Wildlife Survey, Final Report,” September 2009, and “Aquatic Ecology Characterization Report, Detroit Edison Company Fermi 3 Project, Final Report,” November 2009.

3.0 Project Description/Activities Covered by Permits

3.1 Project Description

Detroit Edison proposes to construct and operate an Economic Simplified Boiling Water Reactor (ESBWR) at the Fermi Nuclear Power Plant site. The Fermi site is located in Monroe County, Michigan, approximately 30 miles southwest of Detroit. There are two existing nuclear reactors at Fermi. Fermi 1 is a non-operational demonstration liquid metal fast breeder reactor that is no longer in service. Fermi 2 is an operating boiling water reactor. Fermi 3 will be located adjacent to and generally to the south of Fermi 2 and west of Fermi 1.

Detroit Edison is the sole owner of the existing Fermi 1 and 2 nuclear units. Detroit Edison is the licensed operator of the existing facilities, with control of the Fermi site and existing facilities. Detroit Edison will be responsible for construction and operation of the proposed Fermi 3 power plant.

The ESBWR is a 4,500 MWt reactor that uses natural circulation for normal operation and has passive safety features. General Electric Company (GE, now GE-Hitachi Nuclear Energy Americas, LLC (GEH)) submitted an application for final design approval and standard design certification for the ESBWR on August 24, 2005, see docket number 52-010.

A final commitment has not been made by Detroit Edison to build Fermi 3, however, Detroit Edison continues to pursue a license from the NRC as an option to meet future electricity generating demands for Southeast Michigan. The construction of Fermi 3 is expected to take up to 10 years. All of the work that is expected to have a significant impact on eastern fox snake habitat falls into the category of site preparation activities, such as cut and fill earthwork in undisturbed areas of the site. All of the site preparation activities are expected to occur in the first two years of construction. Once the site preparation work is complete, the primary threat to the fox snake will be from site vehicles, comparable to an operational industrial site.

All aspects of the Fermi 3 project are detailed in the Fermi 3 Combined Operating and Licensing Application. The project has been designed with a goal to minimize the impacts to undeveloped areas and wetlands. Project structures are primarily to be located in already developed or heavily disturbed areas.

3.2 Activities Covered by Permit

This mitigation plan will be provided to the MDNR as part of the permit application process. The permit(s) obtained will help determine the scope of construction activities as they pertain to eastern fox snake impacts.

4.0 Potential Biological Impacts

Fermi 3 construction activities have the potential to kill resident eastern fox snakes as well as destroy or degrade their onsite habitat.

5.0 Conservation Program/Measures to Minimize and Mitigate Impacts

Employee Education Documentation – A document has been prepared which describes the eastern fox snake and its habitat and brings attention to its threatened status (Appendix B). The document contains pictures of the eastern fox snake to aid in identification. It also contains contact information to report sightings. Each construction employee will be required to review and sign an acknowledgement that they have received the information regarding the eastern fox snake and that they understand their responsibilities, prior to beginning work (refer to ISO 14001 pamphlets).

Employee Education/Pre-job brief – At the beginning of each construction work shift, for those construction activities where fox snakes may be encountered, work leaders will review the possibility of discovering eastern fox snakes and the steps to be taken upon a discovery. This pre-job task will be noted on the pre-job brief checklists which are used as part of the project. Job leaders will receive additional education in order to fully understand the fox snake mitigation goals.

Prior to beginning daily work on a developed or already disturbed area, designated employees will walk down the site and observe for eastern fox snakes. In addition, roadways used for construction related vehicles will also be walked down on a daily basis when the snakes are most likely to be present on or along roadways. Any fox snakes located in these areas will be removed by a designated Detroit Edison employee who will then relocate the snakes to undeveloped areas of the site which will not be impacted by Fermi 3 construction. Appendixes D and E provide further details on protocols for locating, capturing and translocating fox snakes to undisturbed areas, mitigation areas or artificially created hibernacula.

One week and again one day prior to clearing undeveloped areas, the areas will be walked through by a team led by a biologist familiar with eastern fox snakes and their habitat. Land clearing activities should be scheduled to be performed outside of the fox snakes hibernation periods so that they are active, easier to locate and safely remove from the area. During this walkthrough, any fox snakes observed will be captured and relocated to an undeveloped location on site which will not be impacted by Fermi 3 construction activities. The lead biologist will ensure that the snakes are not harmed while being captured, transported or released. Potential hiding places for the snakes will be uncovered and searched. Construction workers will continue to observe for snakes as clearing progresses. If a construction worker observes a fox snake during work activities, they are to stop work until the snake clears the area or until designated personnel can clear it from the area.

As fox snakes are a mobile species there will the threat of snakes being killed by construction related vehicles. The measures provided above will provide a substantial degree of protection for snakes which migrate to active roadways. Employees will be aware of the presence of fox snakes

and reminded of their protected status on a daily basis at pre-job briefs. Roadways will be walked down daily in order to ensure that snakes are not present or, if present, removed from the path of danger. Vehicle drivers will be required to stop their vehicles in order to prevent fox snakes from being struck. To further create awareness about the danger posed to snakes from vehicles road signs (Figure 1, Appendix C) indicating that fox snakes are present and must be yielded to will be installed along construction related roadways. Lastly, construction related vehicles will be held to a speed limit of 15 mph while within the construction area. This low rate of speed, provided for construction site safety, will also help allow for snakes to be identified on or along roadways by vehicle drivers prior to being struck.

5.1 Biological Goals

The biological goals of this document have been created utilizing available literature from different sources such as the MDNR, Michigan Natural Features Inventory, and supplemental field guides on reptiles. The over-arching goal will be to prevent the deaths of eastern fox snakes as a result of Fermi 3 construction activities through employee education and awareness, capture and release and monitoring. Location to be used for fox snake release will be determined through consultation with the MDNR and will consider at a minimum habitat quality, potential threats in and to the areas, and the carrying capacity of the release area.

5.2 Measures to Minimize Impacts

5.2.1 Redesigned site layout to minimize the impacts to undeveloped areas which provide potential habitat for eastern fox snakes. The redesign has reduced the construction impact by 117 acres.
5.2.2 Educate Employees through use of a fox snake manual (Appendix B). Employees are to read and sign manual prior to work beginning.
5.2.3 Add fox snake to the pre-job brief checklist so that the issue is reinforced prior to work beginning each day.
5.2.4 Capture and release snakes observed during the course of construction in developed areas (Appendix D & E).
5.2.5 Search for and capture snakes found in undeveloped areas to be cleared (Appendix D & E). Release snakes to onsite undeveloped areas which will not be impacted.

5.3 Measures to Mitigate Unavoidable Impacts

5.3.1 Lead Biologist and team will walk the area(s) prior to the start of construction activities, capturing and then releasing any snakes found to a safe area.
5.3.2 Develop procedure for capture and relocation of snakes including description of devices to use and locations for release (Appendix D).
5.3.3 Employees are to halt work upon discovery of an eastern fox snake until the snake is clear of the activity or is removed by a designated employee.

5.4 Monitoring reports

A log will be maintained, documenting when and where monitoring is performed. In cases where a fox snake is observed while performing a walkthrough, a report will be created noting the number of snakes located and removed and where they were relocated to. A yearly report will also be created summarizing the results of the mitigation efforts. Any snakes killed in the construction process will be reported to the MDNR as required by applicable take permits.

6.0 Funding

Funding for fox snake mitigation efforts will be provided as part of the Detroit Edison Fermi 3 construction budget.

7.0 Changed Circumstances

If during the course of construction any changes in the Fermi 3 site layout are made which will potentially impact fox snakes or fox snake habitat then those employees involved with conducting fox snake surveys will be contacted. These employees will modify the scope of their surveyed areas to include the new areas to be impacted.

8.0 References

8.1 Weatherby, C. A.,Michigan Nature Conservancy Elaphe vulpina gloydi and Clonophis kirtlandii 1986 contracted survey. Michigan Nature Conservancy, Unpublished, rep. 25 pp.

8.2 Lee, Y., "Special animal abstract for *Elaphe vulpina gloydi* (eastern fox snake). Michigan Natural Features Inventory, Lansing, MI. 3 pp.

8.3 Michigan Department of Natural Resources, Endangered Species Assessment http://www.mcgi.state.mi.us/esa, accessed January 15, 2010

8.4 Michigan Department of Natural Resources, Endangered Species Assessment, Map http://www.mcgi.state.mi.us/esa/map.asp?action=map_south, accessed January 15, 2010

8.5 Bailey, R.G., Ecoregions of the United States, 1978

9.0 Appendixes

APPENDIX A

Figure 1 – Wetland Delineation

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. DUCKS UNLIMITED, INC. SHALL NOT ASSUME ANY RESPONSIBILITY FOR THE SAFETY OF THE WORK PERFORMED, PERSONS ENGAGED IN THE WORK, NEARBY STRUCTURES OR OF OTHER PERSONS ON-SITE.

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N

GRAPHIC SCALE

500 0 250 500 1000 2000

(IN FEET)
1 inch = 500 ft.

LEGEND

PSS	PALUSTRINE SCRUB SHRUB WETLAND
PEM	PALUSTRINE EMERGENT WETLAND
PFO	PALUSTRINE FORESTED WETLAND
	APPROXIMATE PROPERTY LINE
	OPEN WATER (FLAGGED)
	OPEN WATER (NOT FLAGGED)
	WETLAND BOUNDARY
	DATA POINT
	HORIZONTAL & VERTICAL CONTROL

HORIZONTAL CONTROL – Coordinates are NAD 83 (CORS 1996) Michigan State Plane Coordinates, South Zone # 2113, units International feet. Coordinates established from NGS OPUS (National Geodetic Survey, Online Positioning User Service) solution for control point 81. Raw data was collected for 5 hours on June 4, 2008 using a Trimble 4700 GPS base receiver. OPUS solution for control point 81, North 167658.689 Ift.
East 13420948.599 Ift.

ONSITE CONTROL, HORIZONTAL

Control Point # 1 – Found concrete monument with brass cap on south side of Fermi Drive near sign.
N. 168217.291 Ift.
E. 13423438.557 Ift.

Control Point # 57 –Found concrete monument with brass cap on south side of Fermi Drive, 1.8 feet south of edge of pavement stamped "N.5108.143, E 3800 , EL. 580.167.
N. 169181.477 Ift.
E. 13422588.221 Ift.

Control Point # 81 – Found yellow capped iron rod #28252, lathe marked "#81 DTE"
N. 167658.689 Ift.
E. 13420948.599 Ift

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OVERALL WETLAND DELINEATION
DTE FERMI II PLANT
MONROE COUNTY, MICHIGAN

REVISIONS:
4/16/2011 PER CLIENT REQUEST PDW

CAD FILE: Overall Wetland Delineation	
DESIGNED BY: –	
DRAWN BY: GB	
SURVEYED BY: GB,WN,PW	
BOOK NO. # 16 PAGE 13-19	
DATE: 7/7/08	
PROJECT NO.: US-MI-158-1	
GLARO-MI3-46-2	

APPENDIX B

Employee Training Program

Fox Snake Training Introduction

This appendix contains typical material to be utilized for training site employees. The information in this appendix will be used, to an appropriate extent and level of detail for the intended training audience, e.g. training materials available in work packages will typically be more detailed than training materials disseminated to all site employees. Training will be more effective if the level of detail presented is relevant to the employee. For example, a site office worker needs to know how to identify fox snakes if encountered on the roadway to and from work, potential active periods for the snakes, the types of areas snakes are typically seen, to stop if one is spotted on the roads, and who to contact if one is seen (e.g. typical level of detail in general employee training). On the other hand, a work lead who is assigned a job which has a potential to impact fox snakes needs to know more details about fox snake habitat and activities (e.g. level of detail in work packages and pre-job briefs). The following discussion describes how training materials will be integrated into site processes.

General Employee Training

Training material will be included in the sites general employee training, required for the site workforce. General employee training is required for site employees and includes topics relevant to nuclear power plant site employees and their responsibilities. The general employee training will be updated to include discussion of employee's responsibilities in regards to eastern fox snakes and their likely habitat.

Work Control

Work control processes establish detailed work plans for site work, well in advance of the proposed activities. This includes items such as scheduling, detailed work instructions, tool and equipment requirements, technical reference materials, organizational and work group roles and responsibilities, checklists, and others. For work that has the potential to impact fox snakes or their habitat, work control documents will include discussion of employee's responsibilities in regards to eastern fox snakes and their likely habitat.

Pre-Job Briefs

Standard work control practices include pre-job briefs which discuss relevant aspects of work to be performed, typically on a daily basis, to verify that each employee understands their roles and responsibilities concerning the job tasks to be performed. The briefs are structured to discuss important aspects of the jobs, what could go wrong, how to avoid negative outcomes, details concerning infrequently performed tasks, and any special characteristics associated with the work to be performed. For work that has the potential to impact fox snakes or their habitat, pre-job briefs will include discussion of employee's responsibilities in regards to eastern fox snakes and their likely habitat.

TRAINING MATERIALS FOR USE AT THE FERMI 3 SITE

The following training materials shall be incorporated into the Fermi 3 construction site general employee training, re-qualification training, work control documents, and pre-job briefs, as appropriate.

How to Identify the Eastern Fox Snake

Eastern fox snakes are large (adult length 3 - 5.5 feet/0.9-1.7 m), boldly patterned snakes with large dark brown or black blotches down the middle of the back and smaller, alternating blotches along the sides of a yellowish to light brown body. The underside is yellowish checkered with dark squarish spots. The head can be yellow, light brown to reddish brown and is generally unmarked except for a dark band between the eyes on the top of the head and a few dark bands extending from the eye to the mouth. Juvenile eastern fox snakes are paler in color than adults and have gray or brown blotches bordered in black on the back and more distinctive head markings.

Habitat

The eastern fox snake inhabits emergent wetlands along Great Lakes shorelines and associated large rivers and impoundments. They prefer habitats with herbaceous vegetation such as cattails (Typha spp.). Although primarily an open wetland species, eastern fox snakes also occupy drier habitats such as vegetated dunes and beaches, old fields, and open woodlands. They also are able to utilize disturbed areas such as farm fields, pastures, woodlots, vacant urban lots, rock riprap, ditches, dikes, and residential properties. Eastern fox snakes are usually found near water, and are capable of swimming long distances through open offshore waters and between islands. This species deposits its eggs under soil, woody debris, sawdust piles, decaying vegetation and

mammal burrows, and hibernates in abandoned mammal burrows, muskrat lodges, or other suitable shelters. Specific habitat needs include: downed woody debris in Emergent marsh, Great Lakes marsh, Lakeplain wet prairie, Lakeplain wet-mesic prairie, Mesic southern forest, Lakeplain oak openings, Mesic sand prairie, Open dunes, and Sand/gravel beach.

Management

Protection and management of remaining populations and habitat are crucial for conservation of this species in Michigan. Maintaining or restoring large, suitable wetland complexes and minimizing habitat fragmentation (e.g., due to roads or development) greatly benefits this species. The site's, "Habitat and Species Conservation Plan – Eastern Fox Snake," provides active and passive requirements that must be followed by all construction-site personnel to minimize impacts to this Michigan threatened species. No work in undeveloped areas of the site can occur until all requirements of the conservation plan and the site's active wetland permits have been carefully reviewed, discussed with environmental personnel and implemented.

Management of wetland habitats should include maintaining open conditions, providing adequate nesting sites and refugia for young snakes through adequate cover (e.g., downed woody debris), and maintaining suitable hibernacula.

When Are Fox Snakes Active?

Fox snakes are typically active from the third week of April to the fourth week of October. Typical breeding lasts from the first week of June to the second week of July. Fox snakes nest from the fourth week of June to the fourth week of July.

Employee's Responsibilities

Employees are required to be able to identify an eastern fox snake if sighted. If a snake is sighted and a positive identification cannot be made, assume it is a fox snake. When sighted, employees are to contact the site environmental engineer, biologist or herpetologist at [PHONE], or at [Bld/Rm], to report any sighting, or potential sighting. When reporting a sighting, identify the place and time, and whether or not positive identification was possible (to the best of your abilities). When a fox snake is sighted, employees are to stop all activities that could endanger the snake, until it has cleared the area and is out of danger. If a snake of any kind is spotted on the road in front of you, you MUST STOP until the snake has cleared the road and immediately contact the appropriate site personnel. Roadways with high eastern fox snake traffic are posted with signs similar to Figure 1 below. Be particularly vigilant in these areas.

Figure 1. Sample snake crossing sign to be used in construction areas.

APPENDIX C

Habitat Restoration and Enhancement Program

March 2012, Revision 1

Habitat Restoration and Enhancement Program

Both on-site and off-site habitat restoration and enhancement as well as off-site wetland mitigation will occur as part of this construction project. The Fermi 3 MDEQ wetland permit (File Number 10-58-0011-P) requires the construction of 107.31 acres of wetland mitigation to compensate for permanent and temporary wetland impacts. The mitigation site is located approximately 7.25 miles south of the proposed Fermi 3 location on an agricultural field on the southern border of the Monroe Power Plant site. The mitigation site will be constructed to compensate for approximately 35.55 acres of permanent and temporary impacts at the Fermi site. Of those 35.55 acres, 19.5 acres will be restored after construction is complete.

These measures are being conducted to maximize the functionality of these habitats for the presence of eastern fox snakes and other wildlife and offset loss of habitat from construction activities. As part of the effort to minimize loss or take of eastern fox snakes, some snakes may be relocated to completed and translocation-suitable mitigation areas to establish this rare species in additional areas. This evaluation will be done in conjunction with project environmental engineer or the project biologist/ herpetologist and the MDNR.

On-site Habitat Restoration and Enhancement

To offset habitat loss during construction of Fermi 3 facility, approximately 19.5 acres of temporary construction areas will be restored to natural habitat post construction with emphasis on creating eastern fox snake habitat. Restoration will include foraging grounds, basking sites, shelter, snags, hibernacula, and nesting sites. Removal of invasive species including Phragmities, Buckthorn, Honeysuckle, Autumn Olive, and Garlic Mustard will be conducted in targeted areas to enhance and improve habitat viability for snakes and other wildlife. Enhancement may also include the creation of wildlife culverts and permanent barrier fences in selected areas of high eastern fox snake activity within the Fermi 3 facility.

Off-site Habitat Mitigation and Restoration

Detroit Edison proposes to restore wetland and enhance existing wetlands in the coastal zone of Western Lake Erie. Habitat restoration will include multiple community types used by eastern fox snakes such as Great Lakes Coastal Marsh (a critically rare community type), Southern Hardwood Swamp, and Inundated shrub swamp. In addition, upland habitat restoration and enhancement is proposed. Habitat restoration design will include eastern fox snake habitat needs and species natural history. Habitat features will include foraging grounds, basking sites, shelter, snags, hibernacula, and nesting sites. The restoration will also benefit other rare species of

herpetofauna known to occur in the region including blanding's turtles, eastern box turtles, and queen snakes.

Habitat Restoration, Enhancement, and Mitigation Objectives

The restoration, enhancement, and mitigation goals of this document have been developed utilizing the considerable professional experience that our project biologists and herpetologists have with eastern fox snakes as well as available literature from sources such as the MDNR, Michigan Natural Features Inventory, and field guides on reptiles to minimize short and long-term impacts from construction activity. A major objective is to minimize take of eastern fox snakes as a result of Fermi 3 facility activities and replace and expand available habitat to not only avoid population decline but ultimately result in an increase in population size, health and viability as well as increase this species spatial distribution. Specific measures for the above will be determined through consultation with the project biologist/herpetologist and the MDNR. All restoration measures will consider future facility maintenance and operational activates to avoid impacts and potential wildlife sinks.

Measures of Habitat Restoration, Enhancement, and Mitigation Success

1. Documented survival of marked and relocated snakes within restored, enhanced, or created habitat areas.
2. Continued survival and long-term viability of Fermi eastern fox snake population through presence of multiple age classes within targeted areas post construction and use of habitat features and structures for intended purposes.
3. Use of restored and enhanced habitat by eastern fox snakes and other native wildlife and establishment of eastern fox snakes within the offsite mitigation area (pending MNDR approval).
4. Reduction in number of eastern fox snake deaths post construction.

APPENDIX D

Eastern Fox Snake Collection, Translocation, and Habitat Monitoring

(During Construction and Five –Years Post Construction)

March 2012, Revision 1

Monitoring will be conducted in all areas restored, enhanced, or created as part of the Fermi 3 facility construction, as discussed below and summarized in Table 1 of this appendix. Sampling will be conducted once site preparation work is complete and for a minimum of five years after completion of the site preparation construction phase. Metrics of success will be gauged through the accomplishment of "*Measures of Habitat Restoration, Enhancement, and Mitigation Success"* found in Appendix C. If problems or deficiencies in the various restoration plans are identified, corrective actions will be taken to fix or address these situations. Invasive plants identified in the enhancement section will be documented during monitoring efforts.

Monitoring Protocols and Evaluation

Sampling protocols will target and address key biological, ecological, and natural history requirements of eastern fox snakes. Sampling will be conducted year round to also evaluate the efficacy and use of snake hibernacula. Monitoring will include use of visual encounter surveys, cover objects, mark-recapture (including PIT tag and Radio Telemetry), and barrier fence surveys.

Collecting and Identifying:

- Suitable habitat will be surveyed for species presence using visual encounter surveys, cover objects, barrier fence, and opportunistic encounters.
- Snakes will be collected throughout the construction and monitoring period and their position recorded using GPS units.
- Specimens will be measured, sexed, weighed, and photographed.
- Passive Intermittent Transponders chips (PIT Tags) will be implanted into collected snakes and serial numbers recorded for future use.
- Snakes will be returned to collection site.

Surveying and Monitoring:

- Wood and metal cover boards will be placed in monitoring areas.
- Silt fence perimeters will be utilized as drift fences for surveying when appropriate.
- For all previously collected and identified specimens, location and biological data (i.e., sex, age, length, weight, and behavior) will be collected during the active season. Snakes found without PIT tags will be collected, identified, and marked using the previously described protocol.

Radio Telemetry:

- Up to a total 25 eastern fox snake will be monitored during the site preparation construction phase (approximately two years) and for an additional five years after this phase. Ten to fifteen randomly chosen snakes (both males and females) of appropriate size will be fitted with radio transmitters (surgery will be conducted by qualified snake specialists) released to protected areas and monitored. Snakes will be observed throughout the year and data recorded.
- Snakes will be surveyed weekly during spring and summer active periods and monthly during inactive season.

Mapping:

- Using GPS equipment that meets EPA Tier II Geospatial Accuracy Standards locations of all observed eastern fox snake will be recorded. Maps of species spatial distribution, age class, home range, minimum convex polygon (MCP), habitat use, nesting and hibernacula, and critical areas will be generated.

Monitoring Reporting

An annual monitoring report will be produced during the construction of Fermi 3 and for a minimum of five years following the completion of the site preparation construction phase. The report will summarize the project overview, species natural history, recovery and relocation efforts, use of restored, enhanced, and mitigated habitats, results of current and previous years' monitoring, analysis of data collected, discussion of findings, significance of results, and recommendations. The annual monitoring report will include current research and review of new information regarding eastern fox snakes and its habitat deemed appropriate to better guide future monitoring efforts and minimize impacts to this species.

Site Preparation Construction Phase Snake Collection, Translocation, and Monitoring

Initial snake collection efforts will focus on construction impact areas and adjacent areas and collection will be conducted on a daily basis prior to clearing and grubbing. Collection techniques will include hand collection via visual encounter, use of barrier fence (Figures 1 & 2), drift fence (Figure 3), and use of artificial cover objects (Figure 4). During the peak of site preparation activities, snake collection will be conducted daily during the fox snake's active season. As the project progresses and snakes are removed from construction zones and areas of potential impact, detection frequency should decrease significantly as population in these areas are removed until a population collection threshold of 90% is reached in target zones (based on capture per effort calculation), at which point targeted snake removal will cease. Monitoring of the Fermi facility will continue for a minimum of five years after the completion of the site preparation phase on an as needed basis with a minimum of once per week during the snakes' active season and one per month during the hibernation period.

Collected snakes will be relocated to on-site safe areas outside the construction zone identified prior to construction or translocated to the completed off-site mitigation area. Collected snakes that are injured will be taken to qualified reptile veterinarian for treatment and maintained off-site until healed and deemed suitable for release.

All captured snakes will be marked with a PIT tag (with some snakes also fitted with radio transmitters) for future identification and detection as described above and monitored during the site preparation and post site preparation phases. After the site preparation construction phase is complete and the bulk of fox snakes are relocated outside of the construction zone, monitoring will be conducted to assess snake movement, habitat use (including created hibernacula), and population health. Monitoring will be conducted at on-site locations, where snakes were relocated to, and at the off-site mitigation area. Snakes that may wander back near construction zones will be relocated outside to safe areas. Monitoring will occur 3-5 days per week when snakes are active and monthly during winter inactivity. Monitoring will be conducted during the entire site preparation construction phase.

Monitoring - Post Site Preparation

During the initial site preparation phase of the Fermi 3 facility (approximately two years) and for an additional five years after this phase, snakes will be monitored to assess their use of on-site and off-site restored, enhanced, or created habitats and assess overall population health. Eastern fox snakes fitted with radio transmitters will be monitored weekly during the fox snake's active season and monthly during the snake's dormant period. In addition to telemetry, targeted monitoring (with emphasis on hibernacula and other critical habitats) will be conducted weekly during the snakes active season using visual encounter surveys, cover objects, mark-recapture (via PIT tag), and barrier fence surveys.

Figure 1. Long-term snake barrier fence .

Figure 2. Temporary snake barrier fence.

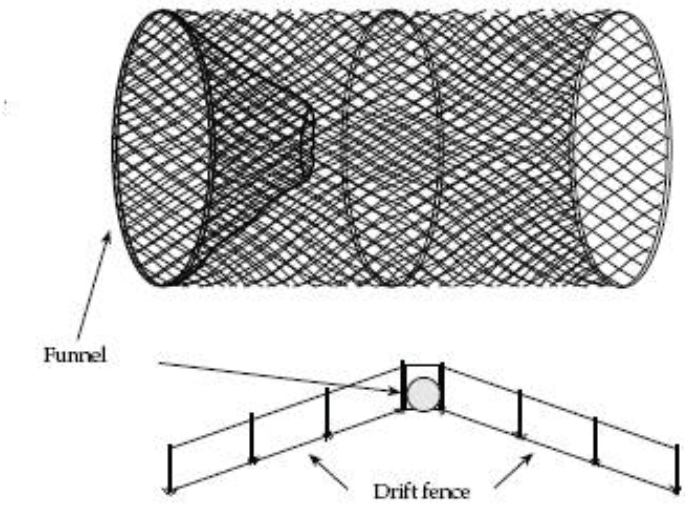

Figure 3. Drift fence system to trap snakes.

Figure 4. Artificial cover objects used to attract snakes for collection.

Table 1 Eastern Fox Snake Construction Monitoring Plan Methods and Representative Timeline				
	Sampling Technique(s)	**Sampling Location**	**Duration**	**Sampling Effort Frequency**
Pre-Construction Rescue and Translocation Phase	**Visual Encounter Surveys, Cover Object Surveys, Barrier Fence, and Mark-Recapture**	On-site Facility: proposed construction impact areas and adjacent areas of high potential for incidental take	EFS active season 90% EFS Removal in Target Zones	Daily for 6-8 weeks or until 90% EFS target removal is achieved
	Radio Telemetry		Concurrent with other Rescue and Translocation Activities. Sampling will continue until 10-15 EFS are collected	Concurrent with other Rescue and Translocation Activities
Construction Phase	**Visual Encounter Surveys, Cover Object Surveys, Barrier Fence, and Mark-Recapture**	On-site Facility: Construction areas and adjacent areas of high potential for incidental take	EFS active season, continue opportunistic EFS collection beyond 90% removal target within construction zones	Daily
			EFS active season, continue opportunistic EFS collection beyond 90% removal target within construction zones during peak construction	As needed: 3-5 days per week
			EFS active season, continue opportunistic EFS collection beyond 90% removal target after peak construction	As needed: 1 time per week minimum
			EFS inactive season, continue opportunistic EFS collection beyond 90% removal target after peak construction	As needed
	Radio Telemetry	Pending location of marked snakes	Spring and summer EFS active seasons	Concurrent with other Monitoring Phase Sampling: 3-5 days per week
			EFS inactive season	Monthly
	Annual Monitoring Report	-	-	1 time per year
Monitoring Phase	**Visual Encounter Surveys, Cover Object Surveys, Barrier Fence, and Mark-Recapture**	On-site relocation areas and off-site mitigation areas	EFS active season	3-5 days per week.
			EFS inactive season	As needed
	Radio Telemetry	Pending location of marked snakes	EFS active season	Concurrent with other Monitoring Phase Sampling: 3-5 days per week
			EFS inactive season	Monthly
	Annual Monitoring Report	-	-	1 time per year

Appendix E

Artificial Snake Hibernacula

March 2012, Revision 1

Artificial Snake Hibernacula

On-site and off-site creation of artificial hibernacula will provide greater available nesting and hibernation sites to enhance the available habitat for fox snake. The project biologist/ herpetologist will guide design, location, construction oversight, and monitoring of snake hibernacula use. Potential hibernacula locations will be evaluated for appropriate slope, soil type, exposure to the sun, and current land uses. From the locations that meet the previous requirements, final locations will be selected to optimize the opportunity for snakes to find the hibernacula.

Snake hibernaculum will be constructed as a pit excavated to a minimum depth of 6' to assure snakes are able to move below frost line (Figure 1). Structural layers filling the pit may consist of natural materials (e.g., logs, stumps, rocks) or artificial materials (e.g., repurposed concrete, flexible PVC) (Figure 2). Parent soil will be placed on top of the fabric (Figure 3). The structure will then be covered with mulch and rocks placed at the entrances to the hibernacula (Figure 4).

Once complete, barrier fence (tall silt fence) will be installed around the hibernacula and adjacent habitat to help facilitate soft release and acclamation of fox snakes to the release site. Periodic maintenance, such as removal of excess vegetation and clearing of debris will be performed, as needed. Fence will be maintained for a minimum of three to five years in some capacity while acclimating eastern fox snakes to the new habitat.

Figure 1. Excavation of hibernacula pit.

Figure 2. Placement of structural layers.

Figure 3. Placement of fill material.

Figure 4. Completed hibernacula.