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**03E16000-2016-F-0104 Phase 3A Intra-Service Sec 7: Diverse Grassland Complexes for SGCN, F12AP01027**

### Consultation Core Info Summary

**Consultation Title:** Phase 3A Intra-Service Sec 7: Diverse Grassland Complexes for SGCN, F12AP01027

**ARRA Fund:** No ARRA funding

**Consultation Description:** Federal Assistance section 7 consultation for grassland restoration, enhancement, and management, and invasive species control. Take of Karner blue, NLEB, and EMR are expected. F12AP01027, MI U-22-HM-1. ELFO BO log #15-R3-ELFO-A07.

**Consultation Type:** Formal Consultation

**Consultation Complexity:** Standard

**Comments:** *None entered*

**Action/Work Types:**

- Fire - Prescribed Burn
- Invasive Plant Control
- Land Restoration / Enhancement - Grassland
- Land Restoration / Enhancement - Upland
- VEGETATION MANAGEMENT

**Species:**

- Eastern Massasauga (=rattlesnake) (*Sistrurus catenatus*) [C03P, V01] (PT)
- Karner blue butterfly (*Lycaeides melissa samuelis*) [I00F, I01] (E) [Entire]
- Northern Long-Eared Bat (*Myotis septentrionalis*) [A0JE, V01] (T)

**Staff Lead:** Tameka Dandridge

**Staff:** *None entered*

**Lead Agency:** Fish and Wildlife Service

**Other Lead Agency:** *None entered*

**Supporting Agencies:**

- Michigan Department of Natural Resources

**Other Supporting Agencies:** *None entered*

**No further Service work performed:** *None entered*

**First Contact Date:** 07/15/2015

**Date of Correspondence:** 07/15/2015

**Start Date:** 07/15/2015

**Formal Consultation Initiated:** 07/15/2015

**Days until Due:** Concluded

**Due Date:** 11/27/2015

**Conclusion Date:** 10/15/2015

**Draft BO Due Date:** *None entered*

**Draft BO Date:** *None entered*

**Final BO Date:**

*None entered*

REGION 3 FEDERAL ASSISTANCE SECTION 7 EVALUATION FORM

PHASE 3 Part A: Completed by Ecological Services Field Office

**Grant Proposal/Agreement/Amendment Title and Number:** Diverse Grassland Complexes for Species of Greatest Conservation Need  
MI U-22-HM-1 (F12AP01027) Mod 1

Listed Species: **Karner blue butterfly** (*Lycaeides melissa samuelis*; KBB, endangered), **northern long-eared bat** (*Myotis septentrionalis*, NLEB, threatened), and **eastern massasauga rattlesnake** (EMR, *Sistrurus catenatus*, administratively "proposed")

I. Programmatic Recovery Biological Opinion:

- **Karner blue butterfly:** Biological Opinion (BO) for Issuance of Section 10(a)(1)(B) Incidental Take Permit to the Michigan Department of Natural Resource, for the take of Karner Blue Butterfly (*Lycaeides melissa samuelis*) in Michigan and associated Habitat Conservation Plan (HCP). Log number 07-R3-ELFO-03. Issued 3/2/2009. This consultation also included **eastern massasauga rattlesnake**.
- **Northern long-eared bat:** Biological Opinion for Wildlife and Sport Fish Restoration Program for funding to the Michigan Department of Natural Resources. Log No. 15-R3-ELFO-10

II. Actions identified on the attached Phase 1 Form were contemplated in the referenced above Biological Opinion. Yes   X   No       

III. The appropriate conservation measures identified in the referenced above Biological Opinion have been explicitly incorporated into the project design and are described in the attached Phase 1 Form. Yes   X   No       

IV. The anticipated effects of the proposed action as described on Phase 1 Form are commensurate with the effects anticipated in the referenced above Biological Opinion. Yes   X   No       

V. Anticipated Take. There is sufficient information available about the proposed action to determine the amount and extent of incidental take. Yes   X   No       

If Yes, complete sections 1 and 2 below:

1. Describe the type & extent of take anticipated to occur as a result of the proposed action.

**Karner blue butterfly:** Take is expected to result from activities related to invasive species control and grassland restoration, enhancement, and management. Disturbance, injury, harassment, and death to adults, pupae and larvae could occur from trampling, fire, mowing, brushing, watering, manual removal of vegetation with hand tools or mechanical equipment and herbicide application throughout occupied habitat. These activities may also disrupt resting, feeding, and reproductive behaviors. However, these

activities are supported in Michigan's Karner blue butterfly HCP and are expected to provide overall benefits to the species and its habitat.

**Northern long-eared bat:** Take is expected from activities related to invasive species and grassland restoration, enhancement, and management. Individual bats are expected to be disturbed, injured, harassed, and/or possibly killed due to prescribed fire and tree removal activities.

2. Reconcile take anticipated with proposed action with the type & extent of take authorized via the referenced above BO (describe take authorization provided in the programmatic and confirm that the level anticipated with the proposed action is within those specified limits).

**Karner blue butterfly:** The type of incidental take anticipated from the proposed actions, namely, harm and death of individual butterflies, is consistent with actions considered in the BO and the conservation measures outlined in the BO. Incidental take will be monitored to ensure that no more than 1/3 of an occupied site is affected during implementation to assure consistency with the BO.

**Northern long-eared bat:** The type of incidental take anticipated from the proposed actions, namely harm and death of individual bats, is consistent with actions considered in the BO and conservation measures outlined in the BO. The Michigan Department of Natural Resources will also adhere to the conservation measures provided in the interim 4(d) rule to minimize take of NLEB. Incidental take will be monitored to ensure that no more than 40,000 acres of NLEB roosting, swarming, staging, and migratory habitat are affected during implementation to assure consistency with the BO, and will annually tabulate and report in detail the acreage of take as required.

\*If there is not sufficient information available to complete this section at the grant agreement/proposal stage, then a future project-specific section 7 consultation is required. States will provide project-specific information to the ESFO as project information becomes available. Incidental take anticipated to result from the proposed action will be described during the project-specific consultation and will be documented on a Phase 3B form. The Phase 3B form will also describe the reasonable and prudent measures that must be followed to exempt the incidental take.

VI. The appropriate RPMs and TCs identified in the reference above Biological Opinions have been explicitly incorporated into the project design and are described on Phase 1 Form.

Yes   X   No       

Proposed & Candidate Species

I. Species:   Eastern massasauga rattlesnake  

II. The proposed action as described on the attached Phase 1 form is Likely to result in Jeopardy or destroy or adversely modify critical habitat (provide rationale for conclusion either in space below or on a separate sheet of paper).

Yes        No   X  

Take of massasauga in locations where hibernacula are unknown is probable as a result of mowing. Mowing will be restricted seasonally where possible, to occur when the rattlesnake is

least likely to be active. Grant activities that may adversely impact hibernacula will be avoided in areas with known hibernacula. The Michigan DNR will follow recommendations stated in the Eastern Massasauga Rattlesnake Management Guidelines for Oak Savanna Restoration in Michigan and Ohio to minimize direct impacts to the species.

Conclusion

This concludes section 7 consultation of the proposed action.

Formal conference is required for proposed/candidate species.

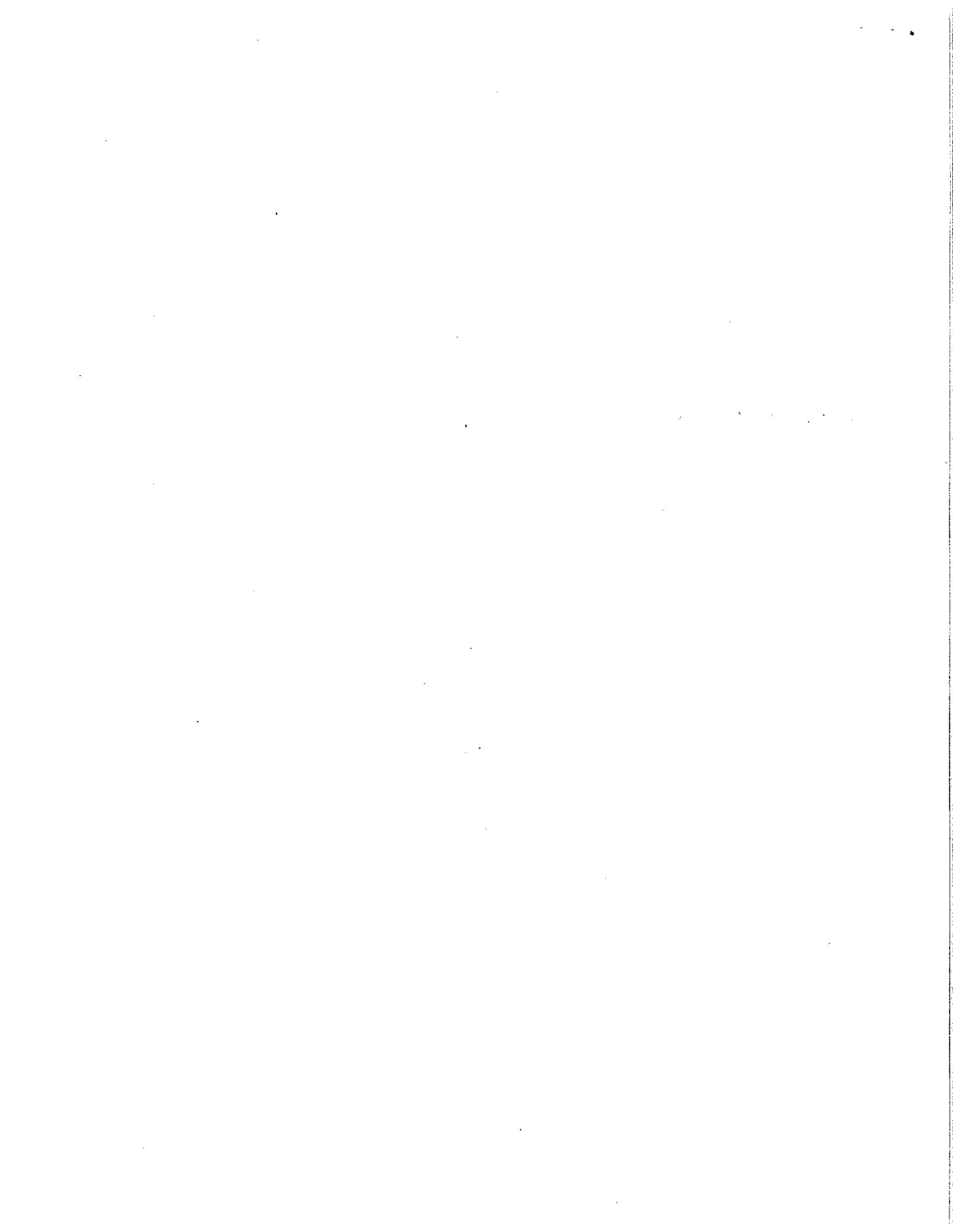
Further section 7 review is required at the project level (Phase 3B form required)

  X    
        
      

Tameka N Dandridge  
Reviewing Biologist

10/15/15  
Date

15-R3-ELFO-A07



**REGION 3 WSFR SECTION 7 EVALUATION DOCUMENTATION  
PHASE II: COMPLETED BY U.S. FISH AND WILDLIFE SERVICE**

State:	Michigan	Grantee:	Michigan Department of Natural Resources
Grant Title and Number	Diverse Grassland Complexes for Species of Greatest Conservation Need MI U-22-HM-1 F12AP01027 Mod 1		

Check the box, if the information on the Phase I documentation is adequate:

- List of Species                       Description of Proposed Action                       Description of Effects

**I. WSFR Determination** Determination of the effects of the proposed action on endangered, threatened, proposed, and candidate species and their proposed or designated critical habitat. When the determination(s) below is/are different than the State recommended determination(s) on the Phase I documentation, an explanation for the difference must be provided in Section II below.

**A. Listed Species/ Critical Habitat** (for each category, list species, attach list or reference Phase I documentation)

- a) "No Effect" (see attached Phase I)

Piping plover, Rufa Red Knot, Copperbelly water snake, Mitchell's satyr butterfly, Poweshiek skipperling, Clubshell, Northern riffleshell, Rayed bean, Snuffbox, Pitcher's thistle, Small whorled pogonia, Piping plove critical habitat

- b) "May Affect, but is Not Likely to Adversely Affect" (see attached Phase I)

Indiana bat, Eastern prairie fringed orchid

- c) "May Affect, and is Likely to Adversely Affect" (see attached Phase I)

Northern long-eared bat, Karner blue butterfly

**B. Proposed Species/ Proposed Critical Habitat** (for each category, list species, attach list or reference Phase I documentation)

- a) "No Effect" (see attached Phase I)

Poweshiek skipperling critical habitat

- b) "May Affect, but is Not Likely to Adversely Affect" (see attached Phase I)

- c) "May Affect, and is Likely to Adversely Affect" (Formal consultation/conference with ES FO is required)

d) "May Adversely Affect/Modify, but is not likely to Jeopardize" (Please see attached rationale in Phase I, also MOU in the permanent files - P:\Central subject matter\Endangered Species Act Compliance)

- NOTE: This determination is a conference, not a consultation, in regards to species proposed for listing that only considers whether these activities jeopardize the species proposed. The conference determination was made with guidance from Ecological Services as documented in the centralized subject-matter file. This determination for any proposed species applies only during the period when it is proposed for listing and consultation will be required for any activities that may affect the species or its suitable habitat that are still in progress after the species is listed.

d) Continued

[Empty box]

**C. Candidate Species** (for each category, list species, attach list or reference Phase I documentation)

a) "No Effect" (see attached Phase I)

[Empty box]

b) "May Affect, but is Not Likely to Adversely Affect" (see attached Phase I)

[Empty box]

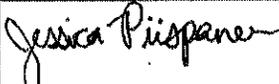
c) "May Affect, and is Likely to Adversely Affect" (Formal consultation/conference with ES FO is required)

Eastern massasauga

d) "May Adversely Affect/Modify, but is not likely to Jeopardize" (Please see attached rationale in Phase I, also MOU in the permanent files - P:\Central subject matter\Endangered Species Act Compliance)

NOTE: This determination is a conference, not a consultation, in regards to species proposed for listing that only considers whether these activities jeopardize the species proposed. The conference determination was made with guidance from Ecological Services as documented in the centralized subject-matter file. This determination for any proposed species applies only during the period when it is proposed for listing and consultation will be required for any activities that may affect the species or its suitable habitat that are still in progress after the species is listed.

[Empty box]

WSFR Specialist  Date: 2015.07.15 08:55:43 -05'00'

WSFR Chief  Date: 2015.07.15 09:11:04 -05'00'

**II. Explanation of non-concurrence:** For each determination that differs from the Phase I documentation, provide rationale for the non-concurrence.

The phase 1 determination for Eastern prairie fringed orchid was "no effect." The phase 1 states: "Eastern prairie fringed orchid is not known to occur at any of the project sites being considered. Extensive inventories were conducted in Michigan for this species in 1990, and an excellent data set has been developed on known populations and their status. The species is most strongly associated with lakeplain prairies, and is not expected to occur in the upland prairies, grasslands, savannas that this project is focused on. In the event that eastern prairie fringed orchid, or any other federally listed plant species, is identified on a site, no management activities will occur until we complete a site specific consultation with USFWS Ecological Services." Because there is a chance that the Eastern prairie fringed may be found on a site, I am making the determination for "May affect, but is not likely to adversely affect."

**III. Notes:**

[Empty box]

REGION 3 WSFR SECTION 7 EVALUATION DOCUMENTATION

PHASE I: COMPLETED BY GRANTEE
(See Phase I Instructions for completing this form)

State: Michigan Department of
Grantee: Natural Resources Grant Program(s): Competitive SWG

Grant Title and Number (add amendment no.): F12AP01027 - Diverse Grassland Complexes for Species of Greatest Conservation Need, U-22-HM-1, MOD 1

I Location:

A. List counties where grant activities will occur.

Grant activities may occur in the following counties:

Table with 5 columns of Michigan counties: Allegan, Eaton, Jackson, Monroe, St. Clair; Barry, Genesee, Kalamazoo, Montcalm, St. Joseph; Bay, Gratiot, Kent, Muskegon, Tuscola; Berrien, Hillsdale, Lapeer, Oakland, Van Buren; Branch, Huron, Lenawee, Ottawa, Washtenaw; Calhoun, Ingham, Livingston, Saginaw, Wayne; Cass, Ionia, Macomb, Sanilac; Clinton, Isabella, Midland, Shiawassee.

B. Describe the action area (see instructions).

Proposed grant activities will occur in prairies, savannas, and grasslands on public and private lands in southern Michigan. Program administration will occur in State of Michigan office buildings.

II. Species/Critical Habitat:

A. Species information

1. Using the FWS web site (http://www.fws.gov/midwest/Endangered/), list species that are/or may be present in the county(ies):

The following species may be present in the counties:

Indiana bat, northern long-eared bat, piping plover, rufa red knot, copperbelly water snake, eastern massasauga, Karner blue butterfly, Mitchell's satyr, Poweshiek skipperling, clubshell, northern riffleshell, rayed bean, snuffbox, eastern prairie fringed orchid, Pitcher's thistle, and small whorled pogonia.

2. List species, from "1." above, that are not in the action area, and explain why:

All mussels can be excluded from the action area because they are present in rivers, and no grant activities are proposed in rivers. Piping plovers and rufa red knot can be excluded from the action area because they only occur on the Great Lakes shorelines, and no grant activities will take place in shoreline habitats.

B. Using the FWS web site, identify whether federally designated or proposed critical habitat is present within the action area:

Piping plover critical habitat (Figure 1) occurs in one county (Muskegon) where grant activities may

occur. Poweshiek skipperling proposed critical habitat occurs in Jackson, Hillsdale, Lenawee, Livingston, Oakland, and Washtenaw counties.

\*Note: If II.A and II.B above have no species or critical habitat, skip sections III and IV and go to V.

**III. Description of Proposed Action:** In the space provided or on an attached sheet, describe the action(s) in sufficient detail so that the potential effects of the action can be identified and fully evaluated.

This project proposes to restore and enhance at least 400 acres of prairie, savanna, and low quality grasslands and plant 1,350 acres of native prairie grasses and forbs on approximately 65 sites in southern Michigan. The project is specifically designed to implement management for the direct benefit and population restoration of up to 115 Species of Greatest Conservation Need (SGCN), including Karner blue butterfly and eastern massasauga that use prairies, savannas, and grasslands.

Site selection will be targeted at existing grasslands that are currently low quality in terms of wildlife benefits but that could be improved through management. Additional grassland, prairie, and savanna sites that are currently high quality will also be managed to address habitat threats that would cause the wildlife benefits to the targeted species to decline. Site conservation plans will also be prepared for approximately 35 of the 65 sites where habitat management will occur.

Management techniques will focus on invasive species removal using prescribed burning, mechanical vegetation control, and chemical control of invasive vegetation. Mechanical vegetation control includes using heavy equipment such as brush-hogs and hydro-axes or hand-operated tools such as brush saws and loppers. Methods are selected based on cost efficiency and sensitivity of the site (i.e., steep slopes or presence of T/E species). To prevent re-sprouts, approved herbicides will be applied to cut stumps or seedlings. Timing of shrub control is dependent on the biology of the species and ecology of the site but will typically be conducted from late summer through winter. Prescribed burns will be conducted by MDNR's staff, our partners, or professional contractors depending on land ownership. Restoration of native prairie and savanna conditions will also be accomplished through site preparation and planting of appropriate grass and forb mixtures. An additional management strategy will be to develop habitat corridors to establish grassland complexes that encompass individual sites. Corridor establishment will involve tree and shrub removal utilizing the techniques described above.

Michigan DNR recently completed a Habitat Conservation Plan (HCP) for Karner blue butterfly and was issued an incidental take permit authorizing limited take while conducting habitat management activities that meet the conditions established in the approved HCP ([http://www.fws.gov/midwest/Endangered/permits/hcp/kbb\\_mi/pdf/MichiganKBBHCPFinal.pdf](http://www.fws.gov/midwest/Endangered/permits/hcp/kbb_mi/pdf/MichiganKBBHCPFinal.pdf)). Michigan DNR's permit does not currently extend to our management partners, but we will ensure that all habitat management in occupied habitat will be in accordance with Michigan's HCP in order to minimize direct effects on the species while allowing habitat restoration that benefits the species to occur. For example, the HCP specifies that habitat management that will result in take may only occur on one third of an occupied habitat patch within a calendar year unless specific conditions are met. Visual surveys will be used to determine the presence or absence of Karner blue butterflies within proposed treatment areas where the species is likely to occur. Whenever pre-treatment surveys are not conducted in areas where the species has been observed recently (i.e., in the past 5 years), presence of Karner blue butterflies throughout the treatment areas will be assumed.

On sites where massasaugas are likely to occur, management activities will follow guidelines developed to minimize direct impacts to massasaugas. These guidelines are derived from our draft Candidate Conservation Agreement with Assurances for massasauga rattlesnakes and are summarized in Appendix A. These guidelines will be followed by project personnel when conducting federally funded management activities in prairies, grasslands, and savannas in counties where massasaugas have been documented.

A monitoring component is also built into the project. Data collection will focus on sites for which baseline conditions have not already been documented. Photo points will be used to document baseline conditions and monitor habitat changes over time as a result of management. On sites with

potential habitat or old records for listed species, presence/absence surveys will be conducted with the assistance of Michigan Natural Features Inventory.

At sites with known rare species, population monitoring will include presence/absence, line-transect, and/or census surveys, depending on the species, listing status, and site. In general, more intensive methods will be used for rarer species. Karner blue butterfly surveys will follow protocols, including distance sampling, developed by the Karner Blue Butterfly Recovery Team and documented in our HCP. These surveys have been used by USFWS, USFS, and MDNR since 2006, and allow estimations of density and population size at sites that have relatively robust populations. Karner populations will be monitored in May for presence/absence in patches that are 5 acres and smaller by searching for KBB for a minimum of 20 minutes per patch. The presence of lupine on a savanna is an indicator that the site might be suitable for Karner blue butterflies, and if lupine is widespread on a savanna project site that has not previously been surveyed for Karner blue butterfly, a presence/absence survey will be conducted before management is undertaken. Selected sites with known populations of Karners will be monitored using established transects in July.

**IV. Description of Effects:** In the space provided or on an attached sheet, describe the effects, including beneficial, of the project actions on the identified species, species habitats and federal critical habitat (see II above).

Management in areas with listed species is specifically intended for the overall, long term benefit of those species. Habitat work is proposed on sites that will likely be inhabited by eastern massasauga rattlesnake and Karner blue butterfly, and Indiana bat and Northern long-eared bat may also be affected by projects associated with this grant.

*Likely to Adversely Affect:*

Eastern massasauga rattlesnake

Mowing and burning may result in harm or mortality to eastern massasauga rattlesnakes. This management, however, is necessary to ensure the continued existence of suitable habitat for this species. It is anticipated that by following the draft conservation strategies identified in Michigan's eastern massasauga rattlesnake CCAA (Appendix A), direct impacts to individual rattlesnakes will be minimized and that the effects of take will not rise to the level of jeopardizing the species.

Massasauga rattlesnake management guidelines indicate that fluctuating water levels may represent a threat to survival during frozen winter conditions, when dehydration can result if water levels are reduced while the snake is hibernating. Grant activities that may adversely impact hibernacula will be avoided in areas with known hibernacula. However, not all hibernacula locations are known; therefore, some adverse impacts could occur.

Karner blue butterfly

Habitat management is planned for five sites that are currently used by Karner blue butterflies, and all activities would only be carried out with the specific intent of improving or maintaining Karner blue butterfly habitat that would degrade if left unmanaged. Nonetheless, there is the potential for adverse effects to individual butterflies. By implementing our HCP guidelines ([http://www.fws.gov/midwest/Endangered/permits/hcp/kbb\\_mi/pdf/MichiganKBBHCPFinal.pdf](http://www.fws.gov/midwest/Endangered/permits/hcp/kbb_mi/pdf/MichiganKBBHCPFinal.pdf)) in managing for Karner blue butterflies, we believe that take will be minimized and that the long term benefit of improving Karner blue butterfly habitat will contribute to the recovery of this species.

Northern long-eared bat

Northern long-eared bats are likely to occur on State Game Areas and on private lands where habitat management will occur. Prescribed burns that occur in savannas/openings that contain scattered trees may affect northern long-eared bats. Generally, fires generated through prescribed burning in savannas is limited to the ground, and flame consumption of mature trees is rare. Additionally, some tree removal may occur during openings and savanna management on public and private lands to set back succession and during creation of habitat corridors. This type of management typically occurs in areas that have previously been maintained as openings or savannas, and creation of corridors may involve removal of small numbers of mature trees. It is anticipated that even if individual bats are

Is BO needed? Can cons  
mors from 4d rule  
be used in lieu of  
BO?

affected by these activities, the effects on individuals will not result in jeopardy to the population.

The following conservation measures will be implemented in all habitat management activities:

- i. Tree removal and prescribed burns will not occur within 0.25 mile from a known, occupied hibernacula;
- ii. Cutting or destroying known roost trees will not occur during the pup season (June 1 – July 31);
- iii. Clearcuts will not occur within 0.25 (0.4 km) mile of known, occupied roost trees during the pup season (June 1 – July 31).

Known NLEB hibernacula and roost trees have been identified in Michigan and we will consult the most up to date map, which is located online at:

<http://www.fws.gov/midwest/EastLansing/te/nleb/pdf/MichiganNLEBRoostTreeHibernaculaFactSheetUpdated15May2015.pdf>.

*May Affect, but Not Likely to Adversely Affect:*

Indiana bat

Indiana bats may use project sites for foraging, and it is feasible that a roost tree could occur in a mature tree or snag in savannas where management is proposed. Savannas generally have <60% canopy cover and it is expected that potential roost trees will be identifiable by the presence of sloughing bark and that these trees can be excluded from prescribed fires and from tree removal activities. Removal of specific mature trees may occur when creating habitat corridors for Karner blue butterflies; however, any trees with characteristics of a potential Indiana bat roost tree will be either be retained, or if removal is desired, the trees will be removed during November-March when Indiana bats are hibernating and not present in trees. Additionally, most management activities will reduce shrubby vegetation in savanna understories, and this could potentially improve foraging habitat for Indiana bats.

*No Effect:*

Eastern prairie fringed orchid

Eastern prairie fringed orchid is not known to occur at any of the project sites being considered. Extensive inventories were conducted in Michigan for this species in 1990, and an excellent data set has been developed on known populations and their status. The species is most strongly associated with lakeplain prairies, and is not expected to occur in the upland prairies, grasslands, savannas that this project is focused on. In the event that eastern prairie fringed orchid, or any other federally listed plant species, is identified on a site, no management activities will occur until we complete a site specific consultation with USFWS Ecological Services.

Copperbelly water snake, Mitchell's satyr butterfly, Poweshiek skipperling, Pitcher's thistle, and small whorled pogonia

No effects are expected for copperbelly water snake, Mitchell's satyr, Poweshiek skipperling, Pitcher's thistle, or small whorled pogonia because these species do not occur in grassland or savanna habitats. Copperbelly water snakes occur in lowland swamps, often in a forested floodplain matrix or adjacent to an upland forested corridor, and they do not inhabit prairies, grasslands or savannas. Mitchell's satyr and Poweshiek skipperling occupy prairie fens exclusively, and these do not occur on the upland sites that are the focus of this management project. Pitcher's thistle only occurs in dune and lakeshore habitats, and small whorled pogonia occurs in second growth and successional more mature deciduous and coniferous forests.

Designated critical habitat for piping plovers and proposed critical habitat for Poweshiek skipperling occurs within the action area, however no activities under this grant will occur in designated or proposed critical habitat.

**V. Recommended Determination(s) of Effect(s):** For all species and critical habitat identified in Section I, mark (X) the appropriate determinations.

**A. Listed, Proposed and Candidate Species**

X a) "No Effect"

List species for which this recommendation is applicable (or attach list): Piping plover, copperbelly water snake, Mitchell's satyr butterfly, Poweshiek skipperling, clubshell, northern riffleshell, raved bean, snuffbox, prairie fringed orchid, Pitcher's thistle, and small whorled pogonia.

X b) "May Affect, but is Not Likely to Adversely Affect"

List species for which this recommendation is applicable (or attach list): Indiana bat

X c) "May Affect, and is Likely to Adversely Affect"

List species for which this recommendation is applicable (or attach list): Northern long-eared bat, Eastern massasauga, Karner blue butterfly

**B. Federally Designated and Proposed Critical Habitat**

X a) "No Effect" to Critical Habitat

List critical habitat(s) for which the recommendation is applied. Piping plover critical habitat and Poweshiek skipperling proposed critical habitat

       b) "May Affect, but is Not Likely to Adversely Affect" Critical Habitat

List critical habitat(s) for which the recommendation is applied. \_\_\_\_\_

       c) "May Affect, and is Likely to Adversely Affect" Critical Habitat

List critical habitat(s) for which the recommendation is applied. \_\_\_\_\_

**Signatures:**

Prepared by:

Name/Title: Christine Hanaburgh/Wildlife Division Federal Aid Coordinator

Signature:  Date: 7/01/2015

Telephone No. (517) 284-6187 email: Hanaburghc@michigan.gov

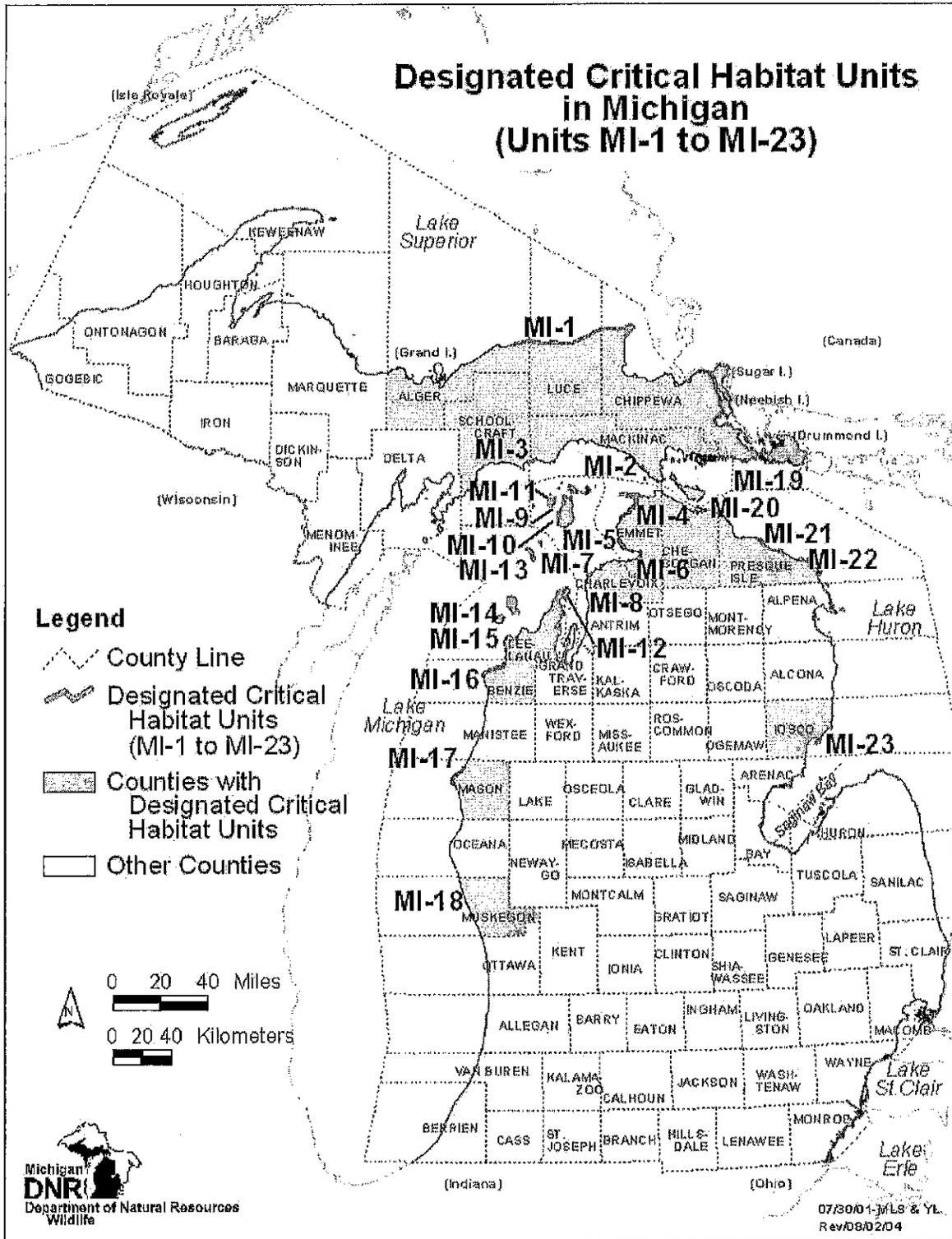
Reviewed by:

Name/Title: Amy Derosier/Wildlife Action Plan Coordinator

Signature:  Date: 7/01/2015

Telephone No. (517) 284-6166 email: DerosierA@michigan.gov

**Figure 1:** Piping Plover designated critical habitat in Michigan.



# APPENDIX A

## Eastern Massasauga Rattlesnake Candidate Conservation Agreement with Assurances Draft Conservation Measures

### Conservation Measures

#### **Management Strategies for Managed Lands**

These habitat management guidelines were developed to provide land managers with a framework to protect EMR populations while creating and/or restoring suitable habitat needed to sustain EMR populations on enrolled lands. These guidelines reflect current knowledge of researchers and resource managers in Michigan. However, we also recognize that our understanding of the factors, including management actions, influencing EMR population dynamics are limited. There is varying degrees of support for the efficacy for the conservation measures currently available for EMR (e.g., informed judgment of experienced land managers, well-documented research across multiple types of sites, etc.). Therefore, as resources allow, an adaptive management approach that targets key assumptions and uncertainties related to management actions is critical to meeting the CCAA standard over the life of this agreement (Section 10). These guidelines will be followed on enrolled lands identified as 'Managed Land'.

When deviations from these guidelines are necessary, a written request to the Service must be submitted as described in "Modifications of the CCAA" on page 25 of the CCAA. If a Participating Landowner is requesting the modification, the DNR must be notified as well. In cases where a quick review is necessary (i.e., short burn windows in the spring, urgent situations), approval must be obtained from the Service. In emergency human health and safety situations (to be decided by the land manager) when pre-approval to deviate from these guidelines is impractical, descriptions of the actions taken will be carefully documented and provided to the DNR and the Service after the fact. Development activities, such as new buildings, parking lots or transportation infrastructure, in enrolled lands designated as managed habitat will require modifications to the CCAA. Development activities in Unmanaged Land will not require modifications; however, they will be subject to Section 7 reviews if a federal nexus exists.

#### Wetland Protection

The primary threat to the EMR is habitat loss, in particular the effects of past, widespread wetland loss. While the DNR lands may have been intended for recreation, forestry, game species, or other purposes they have nonetheless played an important role in conserving EMR by providing places where wetlands have been conserved. The effectiveness of DNR lands as part of conservation landscape for the EMR is demonstrated by the number of remaining EMR populations they support. Conserving wetlands is one of the most significant EMR conservation measures provided by the DNR lands.

#### Prescribed Fire

Fire is a natural process that occurs in many natural communities, including fens and other vegetation types occupied by EMR (Spieles et al. 1999). Fire in fens serves to keep the vegetation open, reduce shrub and tree cover, reduce surface cover and encourage germination and reproduction of many plant species.

Prescribed fire will be allowed in managed habitat even though it has the potential to kill individual snakes. At some managed sites, prescribed fire may be the preferred or only effective management treatment for invasive species or discouraging woody growth for the purpose of maintaining important habitat. The following guidelines will allow managers to enhance or increase suitability of EMR habitat while minimizing the potential loss of individual snakes. Heat from prescribed fire does not reach far into the soil. Therefore, burning during the inactive season is not expected to harm hibernating EMR. Smith et al. (2001) observed that snakes exposed to low intensity fire were more likely to survive than those exposed to high intensity fires. Mortality from prescribed fire is possible, even when steps are taken to reduce that mortality (Durbian 2006, Cross 2009), but the impacts of fires likely vary with other threats, snake population size, fire intensity, and fire frequency. Snakes and other reptiles may move from the burn unit, but in order to provide them more time and potential refuges these guidelines include recommendations to decrease rate of spread and intensity. Rattlesnakes have been known to seek subterranean refuges and may survive less intense fires (Smith et al. 2001).

Prescribed fire promotes dynamic changes in the landscape that set back succession, improve EMR habitat, and may be beneficial to EMR populations in the long run. The impacts from prescribed fire on EMR populations are uncertain and, therefore, will be evaluated for its positive and negative effects to EMR populations and habitat (see Section 10). The following precautions will be observed when using prescribed fire to increase habitat suitability for rattlesnakes.

1. Burning in managed EMR habitat when snakes are inactive or not emergent is unrestricted except when current conditions could possibly result in snake emergence. If available, use a Snake Emergence Prediction Model (SEPM). If the model predicts that snakes may be emergent, burning will be conducted according to the protocols described below. If the model predicts snakes are not active, then burning is unrestricted.
2. Land managers will leave unburned areas adjacent to prescribed burns to serve as snake refugia whenever possible.
3. Prescribed burn plans will use 'back burning' as the primary ignition strategy. This approach will minimize entrapping snakes between flame fronts. However, the burn manager may make the judgment, during a burn treatment, that encirclement ignition or strip firing is necessary to protect human safety or property.
4. A scientific fire behavior model, such as the United States burn model, the Canadian burn model or equivalent will be used to formulate a burn prescription for a maximum rate of spread no faster than 16 chains per hour (17.6 feet per minute) with an average targeted rate of 10 chains per hour or less (11 feet per minute), except in known hibernacula areas. A slower rate of spread may allow snakes within the burn unit adequate time to find refugia.
5. Where hibernacula are known to be dense (greater than 5 hibernacula per acre), no burning is allowed from March 15 to May 15, unless the Snake Emergence Prediction model predict snakes to be inactive and not yet emerged. Where hibernacula are known to be diffuse (less than 5 hibernacula per acre) across the landscape, burns between March 15 and May 15 can move at no faster than 8 chains per hour (8.8 feet per minute).
6. Fire breaks will be established following existing fuel breaks (roads, rivers, trails...) to the greatest extent possible. Cultivation (disking or roto-tilling) of burn breaks will be minimized to the extent that human health and safety are not jeopardized. Cultivation and mowing fire breaks will be established during the inactive season to the extent possible (See 7.1.2 & 7.1.3).

### Mowing and Hydro-axing

In Michigan, mowing has been used to set back succession, control invasive species or establish fire breaks. Mowing is also used to maintain dikes, trails, and other areas designated for human use. While mechanical treatments are an important wildlife management tool, they have been identified to cause direct snake mortality. Mechanical treatments are intensive management techniques that may threaten the long-term survival of localized EMR populations.

The following precautions will be observed when mechanical treatments are used in managed habitat to increase habitat suitability for rattlesnakes and minimize mortalities:

1. Set mower deck heights to maintain turf grass at <15 cm (6 inches) at all times.
2. In areas with known hibernacula, mowing and hydro-axing are not allowed at any time of year.
3. Management will follow the most recent rutting guidelines for the DNR.
4. Mowing or hydro-axing of grasses over 6 inches will occur only during the inactive season, except to control non-native vegetation in degraded habitats.

After snakes have emerged, mowing and hydro-axing will only be allowed when land managers are trying to improve EMR habitat in highly degraded sites (>90% canopy closure or >75% nonnative invasive species). For example, a land manager may want to control invasive species or convert agricultural fields to native grasslands.

### Cultivation

In Michigan, cultivation has been used to establish new habitat plantings, set back succession, and establish fire breaks. Cultivation is strongly discouraged in managed habitat regardless of snake activity.

However, the following cultivation practices will be considered acceptable in managed habitat:

1. Areas that are to be treated with mechanical soil disturbance will be mowed during the inactive season to less than 15 cm (6 in) in height so that they are unattractive to snakes the following spring.
2. Areas may be continuously maintained as row-cropped agriculture.
3. Narrow strips of land may be cultivated for the establishment of fire breaks, as outlined in the prescribed fire guidelines.
4. Cultivation may be used when necessary to protect human or natural resource health and safety (e.g., wildfire suppression).

### Water Level Manipulation

Maintaining the natural hydrology is critical for maintaining viable populations of amphibians and reptiles. In some wetland complexes, the natural fluctuations in water levels help maintain open landscapes. The groundwater or saturated soils protect hibernating snakes from freezing during winter. Draining removes the heat sink capabilities of the water and weakens the thermal link to warmer areas farther underground. Therefore, alterations to wetland hydrology may have negative impacts on amphibian and reptile populations. EMR, like other wetland snakes, have been shown to tolerate submersion for short periods (about 2 weeks) of time when water temperatures are near freezing. They then rely on cutaneous gas exchange. Individuals will be able to respond to flooding during the active season by moving. Flooding will not kill the snakes during the active season, but may force them out of suitable habitat. Extended flooding may destroy elements of the habitat. Beavers promote dynamic changes in the landscape, and may be beneficial to the snake population in the long run. Beaver activity should be evaluated for its

positive and negative effects on EMR habitat and also on human interests.

The following precautions will be observed when manipulating water levels in managed habitat:

1. Water levels in managed habitat will not be drawn down during the inactive season, except for human health and safety reasons.
2. Water levels may not be raised for more than two continuous weeks during a single inactive season, except for health and safety concerns.
3. Permanent flooding or drainage that results in loss of EMR habitat is prohibited.
4. Water levels may be raised during the active season.
5. This agreement does not obligate the DNR to manage beaver to maintain water levels.
6. Temporary flooding to mimic the restorative effects of beaver activity for one to five years will need written pre-approval from the Service.

#### Forest Management

Most forestry activities that are conducted in accordance with sustainable forest management principles are not expected to negatively impact EMR populations. In most cases forest management practices will benefit EMR, especially when the following guidelines are observed on Managed Lands.

1. Conduct timber harvesting operations when substrate is firm and dry in mid to late summer or when the ground is adequately frozen so that rutting and compaction is minimized.
2. Reforest stands through natural regeneration or tree planting (including appropriate site preparation, such as trenching and scarification). Planting densities should be at levels that assure a similar cover type pattern, or retain or mimic more open forest communities (e.g., pine barren or savanna). Savanna and pine barren restorations are encouraged.
3. Consider increasing fine and coarse woody debris retention, creating brush piles and favoring other habitat elements. Slash burning will occur only during the inactive season.

#### Chemical Control

Chemicals have been used by many natural resource professionals to achieve specific habitat management goals and objectives. Currently, many land managers use herbicides because of their effectiveness, ease of use and because herbicides can be relatively inexpensive. Although herbicide use may be an effective habitat management tool, a paucity of research exists on the effects of chemicals on reptiles and, specifically, to EMR. Therefore, it is strongly recommended that land managers consider specific biological factors and utilize a cautious approach when choosing an herbicide, application method, application rate, time of application, and time between applications.

Due to the unknown impacts of herbicides to EMR, broadcast applications in Managed Land is prohibited except when land managers are re-establishing suitable habitat at highly degraded sites (e.g., converting row crops to native grasslands or to control monocultures of invasive species). Land managers may use other herbicide treatments such as spot spraying or wicking to control invasive plant species in Managed Land.

#### Collection, Release, Relocation and Persecution

Collection of EMR for personal pets and commercial trade is an ongoing problem. Poachers have posed as researchers or collaborators of researchers to obtain information on where to find EMR. Pet EMR held in captivity will not be released into the wild because the potential for introducing diseases into an area is significant. Mixing stocks could also have undesirable genetic effects.

The following guidelines will be observed to minimize the potential negative impacts from the collection, release, relocation and persecution of rattlesnakes:

1. Details on specific locations of snakes or hibernacula will be treated with the same sensitivity as location of state or federally listed species. Collection or killing at hibernacula could devastate a population.
2. EMR legally maintained in captivity will not be released back into the wild. Those snakes that have been held temporarily for research purposes may be released where they were captured if they are in good health and have been held in isolation from other reptiles.
3. EMR will only be moved to protect the snake or people. EMR that must be moved should be moved less than 500 m and into the same wetland system but not across barriers (e.g., roads). If a snake is moved across property lines, permission will be obtained from the landowner. EMR lacking knowledge of their surroundings have elevated levels of mortality.
4. Staff will be routinely educated about EMR because they are in an excellent position to provide public education.
5. Priority will be given to placing snakes that cannot be released or are confiscated into the EMR Species Survival Plan population maintained by the Association of Zoos and Aquariums where they may have both an education benefit and contribute to the captive population and possible future assurance breeding.

#### Trails and Pathways

DNR owned and managed trails and pathways currently exist within Managed Land and Unmanaged Land. Trails and pathways are an important component of managing DNR owned land. For human safety, use and enjoyment of trails and pathways, it is necessary to perform maintenance on the trails, including grading, tree-trimming and other activities.

The following precautions will be observed when performing trail and pathway maintenance:

1. Set mower deck heights to maintain turf grass at <15 cm (6 inches) at all times.
2. In areas with known hibernacula, mowing and hydro-axing are not allowed at any time of year.
3. Management will follow the most recent rutting guidelines for the DNR.
4. Mowing or hydro-axing of grasses over 6 inches will occur only during the inactive season, except to control non-native vegetation in degraded habitats.
5. Development of new trails/pathways or substantive changes to existing trails/pathways within Managed Land must include consultation with the DNR Endangered Species Coordinator prior to initiation of construction and construction will be complete during the inactive season.

#### **Management Strategies for Unmanaged Lands**

On Unmanaged Lands other goals and mandates require that the management strategies outlined in Section 7.1 will not apply. The DNR will use the following guidelines on Unmanaged Land:

1. Possession of EMR will continue to be prohibited. This will be accomplished by maintaining the Director's Order (No. DFI-166.98, Regulations on the Take of Reptiles and Amphibians; Act 165 of the Public Acts of 1929, as amended, Sec. 302.1c(1) and 302.1c(2) of the Michigan Compiled Laws) which prohibits take of "special concern" reptiles and amphibians without a permit from the DNR.
2. Upon documentation of more than one individual, evidence of reproduction, and availability of suitable habitat on enrolled lands previously designated as Unmanaged Land, signatories may re-

- classify enrolled areas as Managed Land, but are not required to do so. Consideration will be given to whether the EMRs found are associated with a known and viable population nearby.
3. Management of Unmanaged Land where EMR are unwelcome will focus on management techniques that discourage EMR use. For example, grassy areas around buildings or campsites will be frequently mowed because tall vegetation could attract EMR.
  4. To the extent possible do not restrict dispersal on between Managed Lands that are separated by less than 1 km on the Unmanaged Land. Activities that may limit dispersal may include paved roads or motorized vehicle trails. These activities will be reviewed by the MDNR Wildlife Division and USFWS prior to implementation to ensure they are consistent with the CCAA standard.

### **Management Strategies for Oil, Gas and Mineral Development**

Should the EMR be listed as threatened or endangered under the ESA, authorization for incidental take under the Section 10(a)(1)(A) Enhancement of Survival Permit will be applicable when it is determined that the measures proposed for the lease collectively meet the CCAA standards. Oil, gas and mineral development activities within EMR managed areas may be authorized as a form of incidental take if the DNR determines that the activities proposed for that lease will result in a clear conservation benefit for the EMR.

The goal for an oil, gas, or mineral Certificate of Inclusion is for leaseholders to avoid and minimize negative impacts to EMR and to voluntarily contribute funding or in-kind actions to benefit the EMR. The intent is to provide options that would insure measurable benefits to EMR conservation consistent with the purposes of the CCAA standard (i.e., preclusion or removal of the need to list). This will include compensating for any of the potential biological impacts associated with habitat loss or fragmentation for EMR as well as costs for EMR management in a more complex landscape (e.g., reduced ability to use prescribed fire or increased law enforcement costs).

Conservation measures will be site specific, but fall into general categories of habitat enhancement or avoidance of negative habitat impacts, implementing conservation measures, and addressing critical research needs. These activities will be assessed through leasing or the land use permitting processes and will consider well density, well location, access road surface, length and width, voluntary contributions to EMR conservation, and ongoing and future reclamation activities. It is the responsibility of the oil, gas, and mineral developer to contact the DNR and develop a plan for DNR review, and to sign a Certificate of Inclusion for incidental take coverage authorized under the CCAA when the proposed plan is determined to meet the CCAA standard. Without a signed Certificate of Inclusion the CCAA does not cover oil, gas, and mineral development activities on 'managed' lands.

### **Education and Outreach**

Education and outreach efforts are needed to raise awareness and understanding about the species for all stakeholders, reduce persecution or indiscriminate killing and promote conservation of species. A general approach is to conduct research to identify appropriate content and delivery of education and outreach efforts, learn from other efforts, model after successful efforts such as the Ontario program, identify and recruit partners and target audiences, develop and distribute materials/provide resources, evaluate effectiveness of efforts, develop a volunteer network and ultimately, develop and maintain local, long-term presence/outreach effort in communities around the state within the species' range.

## MODIFICATION REQUEST

F12AP01027

### DIVERSE GRASSLAND COMPLEXES FOR SPECIES OF GREATEST CONSERVATION NEED, U-22-HM-1

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

SUBMITTED: JULY 10, 2015

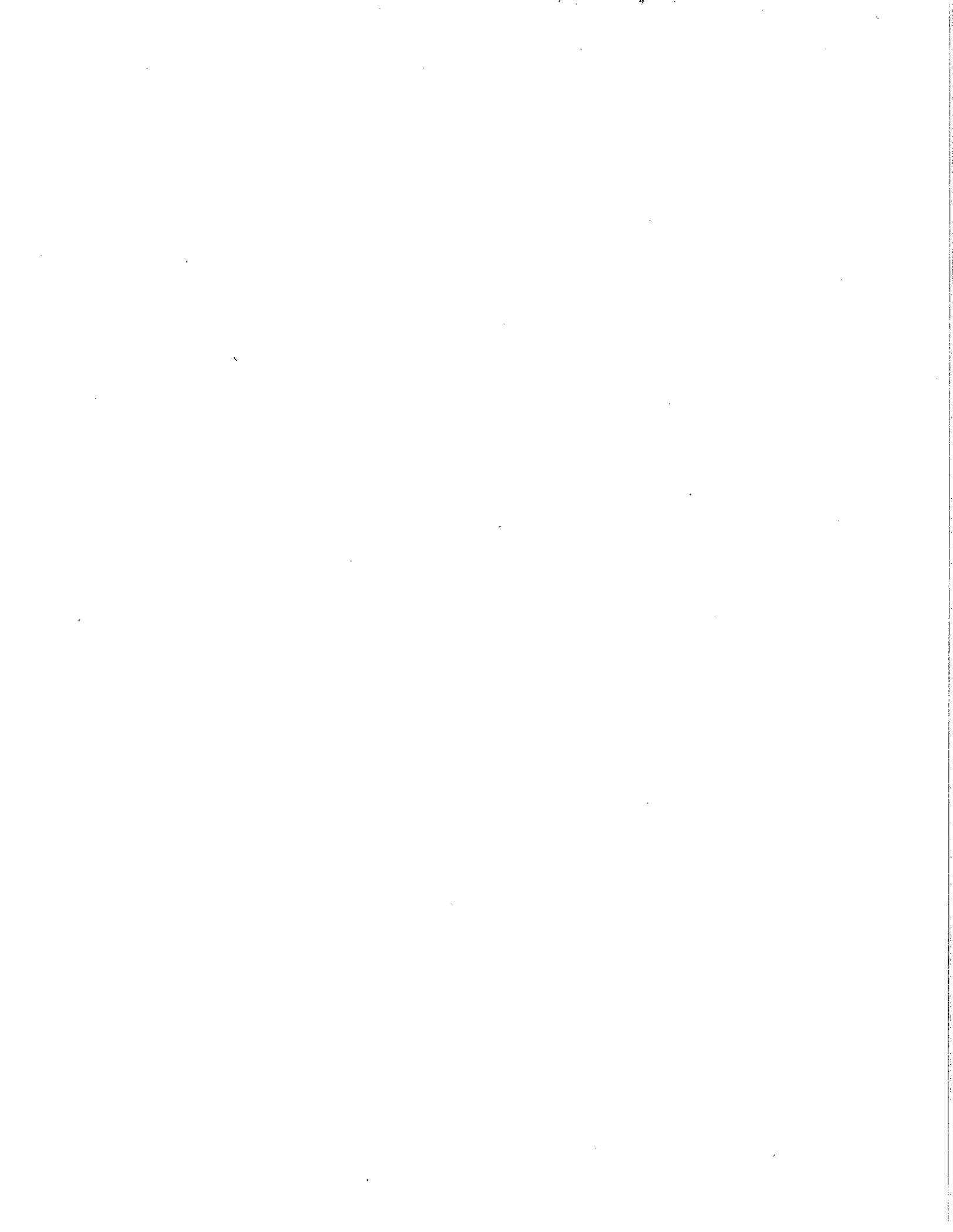
#### **Purpose of Modification:**

The purpose of this modification request is to extend the grant end date by one year, for a revised end date of September 30, 2016. Although we have made substantial progress towards completing all of the objectives proposed in the grant, several have factors contributed to the change in timeline for completing objectives.

Much of the habitat management planned under this grant is specifically targeted at agricultural lands that would provide valuable habitat for SGCN if removed from production, but that may not qualify for existing Farm Bill programs. However, during the first two years of the grant, there was a trend of high commodity prices for corn and soybeans, which made producers of these crops reluctant to remove them from production. Not only were agricultural producers more unwilling to remove their lands from production, but many landowners previously enrolled in Farm Bill programs withdrew from the programs and returned their lands to corn and soybean production. In relation to the objectives of this grant, it was especially challenging to find potential habitat management projects that met the larger acreage criteria required by certain SGCN birds, or to find projects next to other large projects in order to maximize the landscape level impacts of grassland habitat management. The rising commodity price trends that we saw earlier in the implementation of this grant have recently reversed, and we expect to be more successful in identifying private lands which can be managed as large grassland complexes.

An additional challenge in implementing this grant occurred due to a vacancy in Wildlife Division's Private Lands Specialist position since March 2014. This position was filled in an acting capacity by Wildlife Division's private lands biologist for the Southeast Region, but this also led to reduced private lands management capacity in the Southeast Region. The Southeast Region private lands biologist recently returned to his previous position, and we are now able to focus more grant efforts on private lands grassland management projects in this region of the state.

Extending the grant end date by one year will give us an additional field season, which will allow us to meet the target acres planned for management and possibly exceed the planned acres with remaining grant funds.



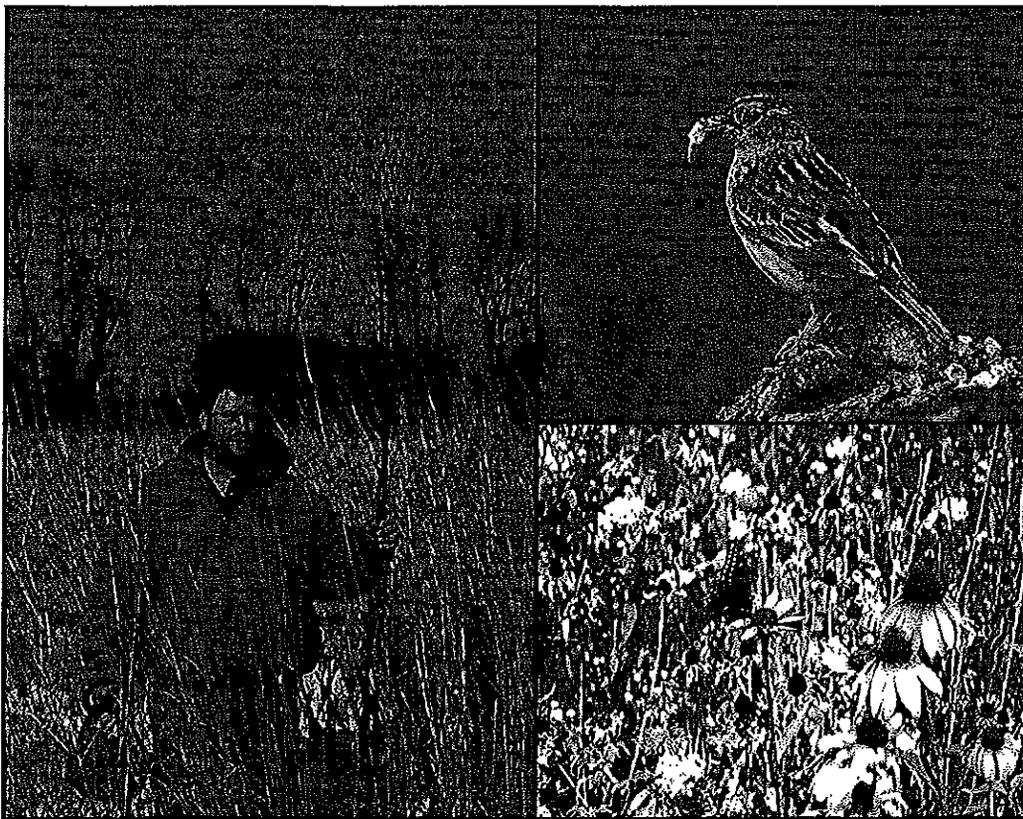
MICHIGAN COMPETITIVE STATE WILDLIFE GRANT

DIVERSE GRASSLAND COMPLEXES FOR  
SPECIES OF GREATEST CONSERVATION NEEDS

U-22-HM

GRANT PROPOSAL  
FOR THE PERIOD: OCTOBER 1, 2012 - SEPTEMBER 30, 2015

MICHIGAN DEPARTMENT OF NATURAL RESOURCES



SUBMITTED: JANUARY 12, 2012

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## EXECUTIVE SUMMARY

The Michigan Department of Natural Resources (MDNR), Wildlife Division (WLD) is requesting \$864,689 in federal funds for *Diverse Grassland Complexes for Species of Greatest Conservation Need* through the State Wildlife Grants Competitive Program (FY12 - FY15). In cooperation with other partners, we will provide 31% or \$388,500 in non-federal match. Exactly 64% of non-federal match (\$250,000) will come directly from MDNR, and the remaining 36% of non-federal match (\$138,500) will come from partners other than the MDNR.

Grasslands, prairies and savannas and the species of greatest conservation need (SGCN) that rely on these habitats are identified in Michigan's Wildlife Action Plan (MI WAP, Eagle et al. 2005). These communities and species are considered conservation priorities due to their rarity, biodiversity value and their dependence on private land management. The most significant threats to grasslands in Michigan are invasive plants, altered fire regimes and landscape fragmentation. Proposed conservation actions to address these threats include exotic/invasive species control, prescribed fire, setting back succession (mechanical treatment), working with private landowners and establishing corridors connecting habitats.

From October 1, 2012 to September 30, 2015, we propose to accomplish four primary objectives. The first objective is to restore and enhance 400 acres of prairie, savanna and low quality grasslands to benefit the following SGCN: the federally endangered Karner blue butterfly (KBB), grasshopper sparrow (state special concern), Henslow's sparrow (state endangered) and Northern harrier (state special concern). The second objective is to plant 1,350 acres of native prairie grasses and forbs which will benefit the species listed above. In total, restoration could benefit up to 115 SGCN. These two objectives will be accomplished by implementing specific conservation actions on at least 65 sites in Michigan. For the third objective, we propose to write a conservation plan for 35 of the 65 project sites. For the last objective, we propose that 1,200 acres or 69% of our restoration efforts will occur on private land.

Ownership	Restoration	Plantings	Total Acres	Sites	Plans
Public Lands	200 acres	350 acres	550 acres	15	4
Private Lands					
TNC	200 acres	0 acres	200 acres	10	1
General Landowners	0 acres	1,000 acres	1,000 acres	40	30
<b>TOTALS</b>	<b>400 acres</b>	<b>1,350 acres</b>	<b>1,750 acres</b>	<b>65</b>	<b>35</b>

Expected benefits of these conservation actions include improving the long-term sustainability of grassland birds and Karner blue butterfly, increasing viability for numerous SGCN associated with grasslands. Wild turkeys, mallards and ring-necked pheasant will also benefit from this management. Several of the proposed sites currently have KBB's and past work on these sites will be continued to increase viability for this species. Monitoring protocols, such as DISTANCE surveys for Karner blue butterfly and point counts or line transects for grassland birds will be implemented to evaluate and adapt management strategies. We believe our monitoring can improve information gaps on the habitat needs and effective management strategies of several SGCN, while providing critical data on the species itself.

A key to the overall success of this proposal is working with our partners. Conservation partners for this proposed work include the Michigan Chapter of The Nature Conservancy (TNC), Michigan Pheasants Forever (PF), Ducks Unlimited (DU), the National Wild Turkey Federation (NWTF) and the Michigan Natural Features Inventory (MNFI), which is the state's natural heritage program and a part of Michigan State University Extension. The MDNR has a proven track record working with private landowners and our conservation partners to manage and conserve habitats for numerous SGCN.

## **NEEDS**

When the first European settlers arrived in southern Michigan they found a landscape of forests, prairies, savannas, and wetlands. Maple and beech were found on the flat mesic plains and oak-hickory forests were found on drier ridges. Scattered across this region, forest graded into savannas and native prairies such as oak savannas and barrens, mesic and sand prairies, and lake plain prairies. On wetter sites, wetland systems, such as forested and shrub swamps, emergent marshes, wet meadows, prairie fens, and coastal marshes, dominated.

**Prairies and savannas** are native grassland systems that were originally found mainly in the Southern Lower Peninsula though they were also found in other parts of the state. General Land Office surveys conducted in Michigan from 1816 to 1856 estimate that prairies and savannas occupied 7% of the state, over 10 million acres (Comer et al. 1995). Since the settlement of southern Michigan, it is estimated that over 99 percent of these original native grasslands have been lost (Sargent and Carter 1999, Comer et al 2009). Approximately 90% of Michigan's oak savannas and barrens have been converted to forest, agriculture or urban development (MI-WAP p. 29). Many of these ecologically rich systems, such as oak openings, burr oak plains, and sand and lake plain prairies, are globally imperiled. Michigan's native grasslands are some of the world's rarest habitats and host many endangered species.

These native grassland systems have been lost due to development, conversion to agriculture, or lack of disturbance leading to vegetative succession (MI-WAP SLP p. 4-8 and p. 29-31). Currently, most of the remaining prairies and savannas in the Southern Lower Peninsula are considered to be degraded or highly degraded (80-90%). Of those remaining, very few, roughly 5%, remain in good or excellent condition. Many of these natural communities are classified as imperiled or critically imperiled within the State or globally (e.g., lakeplain mesic sand prairie, mesic prairie), due to high or extreme rarity. Conservation actions needed for both of these systems include management to restore natural disturbance regimes such as prescribed fire, mowing and grazing; invasive species control, promotion of complexes greater than 250 acres. Working with land managers to promote prairie and savanna restoration and management; and supporting Michigan's private lands program, Landowner Incentive Program (LIP), to foster conservation on private lands will allow us to address these needs.

**Grasslands loss** has been identified as a major issue for grassland birds across the nation. Grasslands such as old fields, hayfields, and pastures can provide critical habitat for SGCN if they are managed appropriately. Approximately two-thirds of these grasslands are considered favorable for wildlife but more than a quarter have limited wildlife habitat value (MI-WAP SLP p. 11-18). Conservation threats include intense mowing and grazing patterns, altered fire

regimes, invasive species, fragmentation and conversion to row crops. Conservation needs include disturbance regimes to set back succession, invasive species control, removing fencerows, creating larger grassland parcels, and working with land managers to promote wildlife benefits on these lands. Based on U.S. Department of Agricultural statistics, agricultural grasslands have declined as much as 60% from the peak number of acres (1921) due to conversion to forest and grain and row crops. Increasing the quantity and quality of grasslands in Southern Michigan will provide habitat for anticipated range shifts due to climate change as grassland species move north.

Year	Acres Hayed
1921	2,928,000
1948	1,563,000
2007	1,166,000

Planted grasslands of high quality grasses and forbs, such as those planted through Farm Bill programs like the Conservation Reserve Program can, if implemented correctly, provide many similar habitat functions as native grasslands. However, many Farm Bill grasslands are of low quality for multiple reasons including planting to low quality or low diversity mixes, planting smaller, fragmented parcels, and insufficient management leading to decreased quality, succession of woody plants and impacts from invasive plants.

Prairies, savannas and quality grasslands provide critical habitat for a variety of SGCN including:

- birds such as the grasshopper sparrow (state special concern), Henslow's sparrow (state endangered), and Northern harrier (state special concern), short-eared owl (state endangered), dickcissel (state special concern), Western meadowlark (state special concern);
- insects such as Karner blue butterfly (federally endangered), persius duskywing (state threatened), Henry's elfin (state special concern) and frosted elfin (state threatened);
- amphibians and reptiles such as Eastern massasauga (state special concern and federal candidate) and spotted turtle (state threatened); and
- mammals such as the prairie vole (state endangered).

Grassland birds are among the most imperiled birds in North America, 48% of species are of conservation concern and 55% are showing decline (NABCI, 2009). Major threats to grassland birds include habitat loss and fragmentation due to agriculture, energy demand for biofuels and global warming. Solutions include restoring and maintaining grasslands, management that is compatible with birds, restoration of wetlands adjacent to grasslands, and managing public lands to benefit grassland birds. More than half of grassland bird species are expected to face additional pressures due to climate change (NABCI 2010). Habitat conservation and the protection of core areas in cooperation with farmers will be required for grassland birds. Because only a small amount of U.S. grassland (less than 2%) is both publicly owned and managed primarily for conservation, the protection of core areas in cooperation with adjacent land owners, particularly farmers will be a key strategy. Grassland bird conservation is a high priority on public lands (NABCI 2011).

This proposal expands efforts from past Michigan's LIP efforts and federal grant funds that have targeted the restoration of critical habitat for SGCN. For example, high priority grassland sites for this proposal are within the watershed of fen restoration sites from past funding from competitive State Wildlife Grants funding. Fens depend almost exclusively on deep groundwater aquifers that are fed by landscapes of hundreds of square miles. Groundwater recharge is greater with natural vegetation, especially deep-rooted native grasslands. According to climate change vulnerability indexes (Kost and Lee 2011, Lee et al. 2011), fens and their associated watersheds are particularly vulnerable to predicted climate change. Grassland restoration in landscapes surrounding fens will also help fen SGCN adapt to climate change.

The Michigan WAP states that "private lands play a pivotal role in meeting Michigan's Wildlife Conservation strategies of protecting statewide wildlife diversity." Statewide, Michigan is 79% private lands and in the Southern Lower Peninsula private lands represent 96% of the landscape. Overall, more than 75% of the 13,150 occurrences of state and/or federally listed species in Michigan are located on private lands, despite the fact that surveys have historically targeted public lands. Although private lands are important to SGCN in Michigan, only a small fraction of Michigan's private lands are actively managed to enhance or protect habitat for SGCN. Thus, technical and financial support from Michigan's Landowner Incentive Program (LIP) is critical to these management efforts. Without federal funding, assistance to private landowners will be drastically reduced due to budget constraints within MDNR (Reeves, MDNR Wildlife Division Assistant Chief, December 2011, pers. com.).

The mission of the Wildlife Division of the Michigan Department of Natural Resources is: *To enhance, restore, and conserve the State's wildlife resources, natural communities, and ecosystems for the benefit of Michigan's citizens, visitors, and future generations.* Implicit in this mission statement is the goal of maintaining viable wildlife habitat for game, non-game and SGCN. To achieve this goal we develop long-term plans or "Master Plans" for each WLD owned property. These plans identify landscape level strategic direction for the property, including habitat management. Many of these strategic plans identify large grassland complexes that are critical for grassland-sensitive SGCN. However, most of these grassland complexes are in extreme need of management and are being negatively impacted by invasive plant species or converting to shrubs due to the lack of funds for active management. Some of the specific management activities needed to address specific habitat objectives are listed below.

Habitat Objective	Prescribed Fire	Mowing/Haying	Herbicides	Grass/forb Plantings	Light or Strip Disking
Woody control	X	X	X		
Invasive species control	X	X	X		
Grassland expansion	X	X	X	X	
Alter soil/vegetation matrix			X	X	X
Increase forb diversity	X		X	X	X

Public lands play a pivotal role in implementing a successful and meaningful private lands program. For example, when planning for landscapes of large grassland complexes starting with a large grassland area on MDNR lands as a hub is essential. These hubs can provide

connectivity among numerous smaller private land grassland projects in the surrounding landscape. Restoring and managing grassland habitats on public and adjacent private lands can create the necessary landscape complexes needed for grassland SGCN. The MDNR is currently implementing several of these landscape scale grassland projects on both WLD lands, as well as on lands managed by MDNR Parks and Recreation Division; however lack of funding has slowed efforts on the ground. For example our goal is to create approximately 450 acres of grassland on the Maple River State Game Area (SGA) while simultaneously working with private landowners to plant another 1,000 acres of grasslands in close proximity to this SGA. This type of effort will be duplicated at Lake Hudson Recreation Area where over 500 acres of grasslands will be created on public lands and adjacent private lands.

Managing grasslands on public land can play a pivotal role in the long-term survival of many SGCN. Managed grassland complexes on public land will have long-term protection from development and fragmentation and can serve as demonstration sites to encourage proper design and implementation on private lands. Another benefit of managing grasslands on public lands is easier access for monitoring and research. MDNR staff conducts monitoring and research as well as partnering with local universities, colleges and schools to monitor and evaluate our management successes or failures.

#### *Implementation of the State's Wildlife Action Plan*

Our proposed work directly implements conservation strategies identified in the Michigan WAP, MDNR Wildlife Division Guiding Principles and Strategies, MDNR Wildlife Featured Species Approach and the Michigan Pheasant Initiative. In addition, our proposed conservation actions directly address threats to prairies, savannas, and grasslands across southern Michigan. WAP conservation strategies addressed in this proposal include:

#### **1) Conservation of areas facing serious threats/best management practices:**

- Exotic/invasive species control - institute invasive species monitoring, prevention and control programs (MI WAP p. SLP-30 and 61).
- Prescribed fire - manage to approximate natural disturbance regimes using prescribed fire (MI WAP p. SLP-30 and 61)
- Setting back succession - manage to approximate disturbance regimes using managed grazing, mowing and prescribed fire (MI WAP p. SLP-30 and 60).
- Habitat corridors - maintain and rehabilitate corridors between wetlands and upland habitats (MI WAP p. SLP-30).

#### **2) Assist private landowners**

- Landowner Incentive Programs - work with private landowners to foster conservation on private land (MI WAP p. SLP-30 and 61).

#### *Species of Greatest Conservation Need*

The proposed conservation actions of this proposal constitute a substantial effort to improve prairie, savanna and grassland habitats to benefit Karner blue butterflies, Henslow's sparrow, grasshopper sparrow, Northern Harrier and 111 other SGCN in Michigan (Appendix A). The status of many of these species is uncertain, and they are listed because their prairie, savanna and grassland habitats are rare and degraded.

### Karner Blue Butterfly

The federally endangered Karner blue butterfly is dependent on savanna remnants. Historically, savannas experienced frequent fires that maintained a mosaic of open grassy and shady conditions essential for Karners. Lupine, an obligate food source for Karner larvae, is found in these remnant savanna patches. This plant is adapted to fire and will not persist in the absence of frequent disturbance. The interconnection of savanna patches on the landscape is an important habitat component for these butterflies. When local populations of KBB's die out because of plant succession, nearby populations can re-colonize the patch when appropriate habitat conditions are re-established. Fire suppression allows savannas to convert to oak forest, causing the loss of both habitat patches and the grassy corridors connecting them. Invasive species such as spotted knapweed are competing with the native vegetation and resulting in a decline in the diversity of vegetation. This proposal will fund work on public and private lands to control invasive species, reintroduce fire, and otherwise alter succession to restore habitat for the Karner blue butterfly and other SGCN that depend on savannas.

### Henslow's Sparrow

Henslow's sparrow is a state endangered species that uses grasslands for all of its life history requirements. They can be found in weedy fields or meadows often in low-lying damp conditions and have a preference for tall and dense grass cover with an abundance of standing dead vegetation in larger grassland complexes. Factors that make habitat unsuitable include natural succession, invasive species, fragmentation, plowing, haying or mowing, and development. The primary conservation need for the Henslow's sparrow is the creation or management of large grassland complexes that support dense older growth, balanced with management that controls natural succession of trees and shrubs. The key is to develop complexes of grasslands that maintain a constant supply of mature grass. This requires regular disturbance to portions of the grassland complex so that optimal Henslow's sparrow habitat is available within the complex at any one time.

### Grasshopper Sparrow

The state special concern grasshopper sparrow is dependent on grasslands such as native prairies, old fields, pastures and savannas. Historically, prairies and savannas experienced frequent fires that maintained an open condition and grassy understory. Fire suppression has caused prairies and savannas to convert to forest. Invasive species such as spotted knapweed, Canada thistle, autumn olive and others are competing with the native vegetation and resulting in a decline in the diversity of vegetation. This proposal will fund work on public and private lands to control invasive species, reintroduce fire, and otherwise alter succession to restore habitat for the Grasshopper sparrow and other SGCN.

### Northern Harrier

Northern harrier is a state special concern species of open landscapes including meadows, marshes, uncultivated fields, and prairies. Wet meadows are preferred nesting habitat, although prairies and uncultivated fields are also used. One hundred years ago this hawk was one of our most common raptors; today it is on the list of special concern species due to population declines. The distribution of harriers is directly related to the availability of grasslands; declines of grasslands have been matched by similar declines in harriers. While prairies and savannas were most likely the preferred habitat before settlement, old fields and hayfields are among the

most occupied habitats today. Only through the protection, management and expansion of marshes and grasslands can this decline be stopped or reversed.

### 111 other SGCN

Prairies, savannas, and grasslands are threatened throughout Michigan, which directly affects the status of Karner blue butterflies, Henslow's sparrow, grasshopper sparrow, Northern Harrier and in addition provides habitat for up to 111 SGCN species. The status of these other species ranges from federal candidate species such as the eastern massasauga to other globally imperiled animals such as the grizzled skipper and secretive locust and species of more local conservation concern. The proposed conservation actions in this grant will improve habitat and conservation status for SGCN that depend on prairies, savanna and grasslands.

### *Relationship to other Wildlife Planning Activities*

In 2010, the MDNR, Wildlife Division released its Wildlife Division Strategic Plan 2010-2015. This proposal addresses numerous specific goals, objectives, and strategies identified in this plan. In 2009, the MDNR adopted a *featured species approach* to focus its habitat management. Featured species are valued wildlife species that have been selected as management priorities. MDNR currently lists 42 featured species, 16 of which use or depend upon grasslands. Nine of those grassland dependent featured species are SGCN. MDNR has also identified grassland complexes as a Landscape-Level Habitat Priority supporting multiple featured species and SGCN.

### *Farm Bill Programs*

Historically, Farm Bill programs such as the Conservation Reserve Program (CRP) provided significant opportunities for Michigan landowners to restore large blocks of grassland habitat. The impact of these plantings was immediately apparent on grasslands birds. Unfortunately, CRP enrollment in Michigan has declined due to the reduction of available CRP acres and increased commodity crop prices that has resulted in the conversion of CRP grasslands to more profitable grain crops. CRP's shift towards establishing filter strips and other narrow corridors has also reduced the benefits on wildlife that prefer large grassland systems.

While Farm Bill programs have had a positive impact on wildlife habitat, these programs have their limitations. Enrollment in CRP is limited to private landowners with cropping history, and lands that have been idle but may have tremendous potential for wildlife no longer qualify. Complex enrollment processes are a challenge that many landowners are unwilling to complete. Additionally, general CRP pays only a 50% cost-share for grassland establishment and many landowners cannot afford their share. Landowners interested in planting grasslands for wildlife often have few available options when they do not qualify for Farm Bill programs. Based on the current political climate it is expected that fewer dollars will be available for conservation provisions in the next Farm Bill.

### *Previous Federally Funded Habitat Activities*

MDNR and our partners have been conducting habitat projects for SGCN for years. Habitat projects for Karner blue butterflies have been implemented and maintained for over 10 years on SGA's. We and our partners have been awarded LIP Grants, Competitive State Wildlife Grants (cSWG), and Endangered Species Grants that were used to improve habitat on both public and

private lands. These funds have benefited many SGCN, including Kirtland Warblers, KBB's, Mitchell's satyr and Eastern massaugau rattlesnakes. U.S. Department of Agriculture - Conservation Innovation Grant funds have also been used over the last three years to explore innovative methods to conserve grassland birds on working grasslands. Funds requested in this proposal will build upon past federal investments by maintaining or expanding existing projects and allowing us to initiate critical habitat projects for other SGCN.

## **OBJECTIVES**

### *Objective 1. Restoration of Prairies, Savanna and Grasslands*

Restore or enhance at least **400 acres** of prairie, savanna and low quality grasslands for the federally endangered Karner blue butterfly, Henslow's sparrow, grasshopper sparrow, Northern harrier, and a diverse array of grassland SGCN. We propose to improve suitable habitat on at least 5 sites in Michigan known to harbor Karner blue butterfly. In addition, we will restore 5 sites that offer high potential for Karner blue butterfly, but currently do not harbor any butterflies. These restoration activities will improve the long-term sustainability of Karner blue butterfly and other SGCN that use prairies, savanna and grasslands. Funds from this proposal will not be used to relocate Karner blue butterflies. A biological monitoring plan is enclosed (see monitoring section) that describes a hierarchical process for monitoring baseline conditions and habitat changes, and population sampling for SGCN. Depending on the site or species, monitoring procedures may include photo points, plot sampling, course metrics, presence/absence surveys, line-transects or census surveys.

### *Objective 2. Planting Native Grasses and Forbs*

Plant at least **1,350 acres** of native grasses and forbs for grassland birds such as Henslow's sparrow, grasshopper sparrow and northern harrier and a diverse array of SGCN. We propose to improve suitable habitat for grassland birds on at least 55 sites in southern Michigan. Emphasis will be placed on conducting the majority of this work within identified priority areas (Appendix B) and creating larger complexes within grassland landscapes. At least 10 sites will be adjacent to or within occupied habitats for our priority SGCN. These restoration activities should improve the long-term sustainability of birds and other SGCN that utilize grassland habitats in southern Michigan. This work will be conducted on public and private lands including lands owned by county and township governments. For instance, grasslands owned by Springfield Township in Oakland County will be one of the focus sites. Past LIP and cSWG grants have focused on fen habitat owned by the township; this grant will allow us to improve the grasslands surrounding this fen. A biological monitoring plan is enclosed (see monitoring section) that describes a hierarchical process for monitoring baseline conditions and habitat changes, and for habitat and population sampling for federally occupied habitats and SGCN.

### *Objective 3. Conservation Plans*

Conservation plans will be developed, where necessary, for the 65 sites identified in the first two objectives, to identify the potential threats to each site. In cases where a management plan already exists, it will be reviewed and updated as needed to address grassland threats and management. It is expected that at least **35 sites** will require management plans either written or revised. The purpose of these management plans will be to recommend conservation actions that abate, mitigate, or eliminate threats and improve the long-term sustainability of Karner blue

butterfly, Henslow's and grasshopper sparrows, northern harrier, and a diverse array of grassland SGCN and their associated habitats.

**Objective 4. Private Lands Management**

At least 1,200 acres (69% of acreage identified in objectives 1-2) of grassland restoration or establishment will occur on private lands in southern Michigan. Private lands owned by conservation partners such as The Nature Conservancy, local municipalities, and traditional private landowners play an important function when addressing resource management on a landscape scale.

**EXPECTED RESULTS AND BENEFITS**

Through completing the objectives of this grant, we will make a substantial step towards meeting the overall goal of Michigan's WAP of keeping common species common and conserving SGCN. The conservation actions identified in this proposal are expected to benefit Karner blue butterflies, Henslow's sparrow, grasshopper sparrow, and Northern Harrier found in prairies, savannas and grasslands. Due to the urgency and need for conservation, four targeted species have been chosen as priority species for this project. These SGCN have specific habitat requirements, threats, and conservation actions will be addressed to provide short and long-term benefits (Table 1).

Table 1. Expected short and long-term benefits for targeted SGCN and their habitats.

Objectives	Conservation Actions	Outputs	Short-Term Benefits	Long-Term Benefits
<i>Accomplishments that will improve the status of SGCN or their habitats</i>	<i>Accomplishing these activities will result in the following measurable deliverables:</i>	<i>Accomplishing these activities will result in the following evidence of progress:</i>	<i>We expect the following measurable changes within a ten-year period:</i>	<i>We expect the following impacts / trends beyond ten years:</i>
Restore or enhance 400 acres of prairie, savanna or poor quality grasslands to benefit KBB and other SGCN  Plant 1350 acres of grasslands for SGCN.  Restore or plant at least 1200 acres of prairie, savanna or grasslands on private lands  Write 35 conservation plans for each project site	Conduct prescribed burns  Remove exotic/invasive plants  Mechanical treatments to set back succession  Reconnect fragmented habitat through corridors  Work with private landowners to enhance SGCN habitats  Write plans to guide conservation actions	Improve suitable habitat on at least 5 sites known to harbor KBB in Michigan  Improve savanna habitat on 5 sites for other priority SGCN  Plant native grasses and forbs on at least 55 sites for SGCN  Increase number of landowners working on implementing Michigan's WAP  Conservation plans for at least 35 sites in Michigan	Help meet federal recovery goals for population and habitat for KBB  Increase 1750 acres of SGCN grassland bird habitat  Increase number of landowners implementing MI's WAP  Increase public awareness of Wildlife Action Plans	Increase viability of KBB populations  Help maintain high, stable populations of KW  Increase public participation in managing habitat for SGCN  Improve habitat and population viability for a variety of SGCN  Increase the likelihood of downgrading species' listing status

## APPROACH

The MDNR has a proven record of coordinating and cooperating with conservation partners, contractors, public land managers and private landowners to implement a multitude of conservation projects state-wide. The primary reason for this success has been our exceptional ability to engage with a diversity of partners and the development of a strong private lands program, LIP. Our partners provide program direction through regional steering committees and other informal working groups, plus technical and financial support for projects. MDNR biologists are dedicated to implementing conservation actions to restore habitat for SGCN. Specific to this proposal we are working with a variety of partners to provide match, technical expertise and the land required to ensure successful implementation of this proposal. The table below explains the roles and support that these partners will play in meeting this grant.

Partner	Match Funds	Technical Assistance	Financial Assistance	Seed & Equipment	Monitoring
MDNR	X	X	X	X	X
TNC	X	X			X
PF	X	X	X	X	
NWTF	X	X	X	X	
MNFI	X				X
DU	X		X	X	
MDARD		X			
Conservation Districts		X		X	
USFWS Partners for Fish & Wildlife		X			
USDA – NRCS & FSA		X			

Past planning efforts have identified priority areas for grassland management and creation in Southern Michigan. These focus areas are based on GIS analysis of grassland landscapes, degree of agricultural operations, percentage of forested lands, and past experience of landowner cooperation and success in program delivery. This planning effort included a large array of conservation partner involvement and input. This effort results in identifying 4 areas each including 3 counties per area (Appendix B).

### *Approach 1. Restoration of Prairies, Savanna and Grasslands*

The first objective will be accomplished by restoring at least 400 acres of prairie, savanna and low quality grasslands for Karner blue butterflies, Henslow's sparrow, grasshopper sparrow, Northern Harrier and numerous grassland SGCN in southern Michigan. We propose to restore at least 5 sites that currently harbor the Karner blue butterfly, plus an additional 5 savannas for other priority SGCN. Once restored, we anticipate these sites will eventually support reintroduced/naturally migrated populations of Karner blue butterfly. All of these sites will be located within previously identified priority areas already identified (Appendix B). Occupied sites vary in KBB population viability, amount of habitat occupied, potential habitat quality and ownership. Therefore, MDNR biologists will work closely with our partners to update or develop conservation plans and implement needed actions. The MDNR biologist will work with our partners to allocate resources, implement projects and execute a monitoring program. The

MDNR will also coordinate all of the above listed activities with our partners through existing work groups such as the Karner Blue Butterfly Working Group. Specific management techniques are identified below within the Conservation Actions section.

The Michigan Chapter of The Nature Conservancy owns or manages over 150 acres and MDNR over 800 acres that contain savanna and Karner blue butterfly habitat. Funds from this proposal will help TNC manage these lands for KBB. MDNR and TNC will both be involved in conservation planning, project implementation and monitoring to restore and enhance savanna grassland for KBB.

### *Approach 2. Planting of Native Grasses and Forbs*

The second objective will be accomplished by planting 1,350 acres of native grasses and forbs for grassland SGCN across southern Michigan. We propose to plant at least 55 sites mainly within identified focus areas for a diverse array of SGCN. MDNR has taken a GIS based approach to identify key grassland focus areas in the state. This effort will be expanded to incorporate a greater diversity of SGCN as well as current locations, size and densities of Farm Bill grasslands presently on the landscape. In numerous areas Farm Bill grasslands approach a density and distribution that creates the grassland mosaic necessary for conservation of target species. Targeted planting can fill important gaps in this mosaic, minimizing fragmentation of grasslands for size dependent species.

Specific project sites and conservation projects will be identified within the focus areas by MDNR biologists and our partners. Projects will be distributed between private and public lands, with emphasis on private lands in landscapes surrounding public lands projects. Specific criteria have been developed by the MDNR and partners to prioritize potential projects: 1) location of SGCN in the proximity, 2) proximity to other grasslands, 3) presence of multiple SGCN, and 4) additional match from partners.

MDNR biologists will work closely with Michigan Department of Agriculture and Rural Development (MDARD) and local Conservation District (CD) Farm Bill biologists to promote grassland projects as well as implementation of procedures to get planting established. MDNR has worked closely with MDARD and CD staff to encourage and implement conservation practices on agricultural lands. Conservation Districts have signed a Memorandum of Agreement to coordinate the use of MDNR native grass drills at the local level and provide technical and implementation support to landowners as they implement grassland plantings.

### *Approach 3. Conservation Plans*

A site specific conservation plan will be written for over 35 sites identified in objectives 1 and 2. In cases in which a management plan for the site already exists, the plan will be updated as needed to meet the objectives of this grant. Conservation plans, at a minimum, will provide a detailed assessment of potential threats, identify specific conservation actions to address each threat and outline a monitoring protocol. Plans will also contain maps that delineate occupied habitat for state or federally listed species, all of which are designated as SGCN in Michigan's WAP. Management recommendations will be concurrent with the landowner's goals for SGCN and will be written for the landowner by the MDNR biologist, CD Farm Bill Biologist or by other conservation partners. Plans developed for public lands plans will follow the SGA Master

Plan template and plans developed by private lands biologist for private lands will use the LIP planning template and narrative which has been developed to streamline plan writing.

#### *Approach 4. Private Lands Management*

The MDNR is committed to conserving wildlife on private lands and has successfully operated a private lands program over the past 20 years (for a specific example see Appendix G). Most recently, the MDNR's Landowner Incentive Program (LIP) has taken a lead role in conservation, protection and enhancement of habitat for SGCN on private lands. Michigan's program is targeted, ecosystem-based and identifies key priority areas to restore habitat for SGCN.

Michigan's LIP is an important tool for implementing the MDNR's WAP and has allowed us to manage habitats for SGCN by providing financial and technical assistance to private landowners across Michigan. Since 2004, MDNR's LIP staff has accomplished the following:

- Provided technical assistance and habitat direction to 903 landowners covering 91,000 acres.
- Restored, enhanced and managed more than 24,000 acres of habitat for SGCN state-wide, including Mitchell's satyr and Karner blue butterfly.
- Documented 125 new occurrences of rare and declining species and 7 new occurrences of natural communities.

The MDNR private lands program has strong partnerships with other agencies, conservation organizations, communities and individuals and has capitalized on opportunities to work on common goals. These partnerships have helped influence Farm Bill programs to benefit wildlife and SGCN. The most recently developed Farm Bill program, State Acres for Wildlife (SAFE), was co-developed by the MDNR, TNC and PF to create savanna and diverse grassland habitat on former agricultural land. Partnerships with other private lands programs such as USFWS Partners for Fish and Wildlife program have helped to increase the quality of wildlife habitat projects. MDNR works closely with MDARD and CD staff to encourage and implement conservation practices on private lands.

To implement this grant, MDNR biologists will continue to work with other private lands programs and partners to increase the number and scope of projects restoring grasslands and associated SGCN. The knowledge and partnerships of other private lands programs helps to maximize State Wildlife Grant funds and bring additional resources to achieve common goals (e.g., savanna restoration, grassland plantings).

#### *Conservation Actions*

Conservation actions will be implemented by the MDNR, conservation partners, private landowners or private contractors. The primary goal will be to restore prairies, savanna, and low quality grasslands and to plant new grasslands for SGCN based on site-specific threats. Conservation threats include exotic/invasive plants, altered fire regimes, shrub and tree encroachment, and habitat fragmentation. A detailed site specific conservation plan will be created for each site if needed and will identify site specific threats and related conservation actions (Objective 3).

### Grassland Plantings

The majority of Michigan's original grasslands have been lost and only a fraction of historical acreage remains as remnants. Grassland plantings of native grasses and forbs can replace the wildlife habitat functions of prairies and savannas for grassland birds. Grasslands will be planted to diverse mixture of native grasses and forb species appropriate to the soil type, SGCN habitat needs and in coordination with landowner objectives.

MDNR and our partners have over 20 years of experience in planting and establishing grasslands dominated by native grasses and forbs. Over the last 15 years MDNR has purchased over 30 no-till prairie grass planters specifically for this purpose. These drills are maintained by local county conservation districts and are available for private and public lands projects. These drills have installed over 50,000 acres of grassland habitat. Proper pre-planting site management and best management practices for planting will be followed to ensure high levels of success for habitat installation. WLD has developed a native grass planting manual that covers all aspects of planting based on soil types and pre-planting site conditions.

### Prescribed fire

Prescribed fire is an important management tool in grassland ecosystems. Decades of fire suppression have led to the loss of prairie grasses and forbs, species diversity, increased shrub invasion, and exacerbated the spread of invasive species. Prescribed burning is conducted according to a carefully designed plan that maximizes ecological benefits while minimizing adverse impacts to rare species and public resources.

Prescribed burns will be conducted by MDNR's staff, our partners or professional contractors depending on land ownership. On State owned land, MDNR will develop a burn plan and coordinate the burn. The Nature Conservancy has professionally trained staff to write burn plans and conduct burns. On all other private lands, the MDNR biologists will work with the private landowner to review management objectives, identify burn units, write a burn plan, hire a professional burn contractor and monitor results. Cost-share is occasionally provided by the private landowner through in-kind match for site preparation activities (e.g., establishing fire breaks). Private lands biologists have reviewed over 100 burn plans, taken prescribed fire training and funded for over 100 burns through the MDNR's LIP. Burns funded will follow specific standards and best management practices that have been developed to ensure proper and safe use of fire on private lands.

### Invasive species control

Removal of invasive plants will be conducted where infestation poses a critical threat to SGCN and their habitats. Commonly targeted invasive species include shrubs such as autumn-olive and honeysuckle as well as herbaceous species such as spotted knapweed. Invasive species have greatly reduced available habitat for grassland birds and immediate removal of invasive species is required to recover and support sustainable bird populations.

Removal of invasive plants will be conducted by the MDNR, our partners, private landowners or by private contractors. The MDNR has a history of working with private contractors that specialize in ecological restoration (Appendix C). Plants are controlled by a variety of techniques including: manual, mechanical, chemical, biological and prescribed fire or a combination of multiple techniques. In all cases, care is taken to maximize control while

minimizing non-target damage to other native plants and animals. Landowners may conduct the work themselves, or with direction from the MDNR or our conservation partners. To ensure successful treatments, MDNR considers timing of plant removal, species biology, ecology of the site, the best techniques established in the literature and by practical experience. The MDNR biologists have worked with our partners and private contractors on hundreds of invasive species projects across the state.

#### Mechanical treatments - setting back succession

Mechanical shrub control is used where shrub invasion is so severe that other management tools such as prescribed fire are not effective. Shrubs have invaded many formerly open areas due to fire suppression, virtually eliminating habitat for many grassland SGCN. Shrub control will be conducted by MDNR staff, our partners and/or qualified professional contractors. Activities include using heavy equipment such as brush-hogs and hydro-axes or hand-operated tools such as brush saws and loppers. Methods are selected based on cost efficiency and sensitivity of the site (i.e., steep slopes, or presence of T/E species). To prevent re-sprouts, approved herbicides will be applied to cut stumps or seedlings. Timing of shrub control is dependent on the biology of the species and ecology of the site but will typically be conducted from late summer through winter. The MDNR biologists have provided funding for over a hundred projects to set back succession in savannas in southern Michigan. In some cases disturbance such as light disking or strip disking may be used to alter successional paths or to increase diversity of forbs.

#### Creation of natural corridors

Habitat corridors play a critical role in minimizing the impact of habitat fragmentation on grasslands and SGCN. The majority of existing grasslands in Southern Michigan exist as habitat islands. Providing habitat corridors can greatly increase the value of both existing and new grasslands created under this proposal for SGCN.

Corridor planning will include both coarse and fine scale approaches. The fine scale approach will address site-specific issues such as reconnecting isolated patches of prairies, savannas or grasslands. The coarse scale approach will focus on restoration of landscapes, which includes multiple grassland sites and the land in between these communities. This includes the restoration of degraded prairies, savannas and grasslands as well as the potential creation of grasslands in former agricultural areas for the benefit of SGCN. MDNR biologists will work with partners to coordinate planting, site preparation and follow-up activities like mowing and herbicide application. MDNR biologists have worked with our partners and private contractors on hundreds of prairie, savanna and grassland creation projects in southern Michigan.

#### *Monitoring Plan*

A biological monitoring plan has been developed for prairies and savannas and key species for the MDNR based on protocols used by the U.S. Forest Service (O'Connor 2007). This document includes a detailed description of methods proposed to monitor specific species and their habitats. A similar protocol will be developed for planted native grasslands. In general, a hierarchical approach will be used that allows resources to be concentrated on sites, habitats and species of greatest interest. Where progress toward accomplishing short-term and long-term benefits is determined to be unsatisfactory, adaptive management strategies will be used to ensure goals and objectives are met. Monitoring will be conducted by MDNR biologists as well as by conservation partners such as MNFI and TNC in a way that maximizes the quality of

information and expertise, while minimizing time and resources. Specifics of the monitoring plan are as follows:

- 1) Baseline conditions have been or will be established at project sites. Data collection will focus on sites for which baseline conditions have not already been documented. Photo points will be used to document baseline conditions and monitor habitat changes over time as a result of management.
- 2) At selected sites, including sites with occupied habitat for federally listed species, more intensive habitat monitoring such as plot sampling and coarse-level metrics (Pearsall and Woods 2006) will be used to track progress towards specific restoration goals.
- 3) On sites with potential habitat or old records for listed species, presence/absence surveys will be conducted with the assistance of MNFI.
- 4) At sites with known rare species, population monitoring will include presence/absence, line-transect, and/or census surveys, depending on the species, listing status, and site. In general, more intensive methods will be used for rarer species. For federally listed species, all monitoring will be conducted using established protocols to guarantee compatibility with data collected by other public agencies and non-governmental organizations.
  - a) Karner blue butterfly surveys will follow protocols developed by the Karner Blue Butterfly Recovery Team. These surveys have been used by USFWS, USFS, and state agencies since 2006, and allow estimations of density and population size at sites that have relatively robust populations. Populations will be monitored in May for presence/absence, and selected populations will be monitored using established transects in July.
- 5) We will look for opportunities with additional partners such as universities and research organizations, to use these sites as long-term study areas for habitats and SGCN. This will ensure that benefits to SGCN initiated by the program will be monitored well beyond the scope of this proposal. For example, LIP funds and cSWG funds have been used in the past to implement habitat management techniques on sites where university research studies have monitored the impact of these activities on vegetation and SGCN populations for years following the treatment.

#### *Performance Reports, Monitoring Results, and Adaptive Management*

The MDNR will compile annual performance reports that document progress towards management goals and objectives. Monitoring of habitat and species populations that are conducted by partners, such as TNC and MNFI, will be compiled into an annual report and the results shared with all partners. Forums such as the Karner Blue Butterfly Recovery Team and other species management groups will provide additional opportunities to disseminate monitoring results and discuss progress towards restoration goals. Active participation on these groups facilitates information sharing and helps address emerging threats before they become widespread issues. For example, we discuss and share information related to population trends, the status and impacts of current management efforts, and the setting of priorities. The resulting data is summarized and shared with all partners at the annual meeting. By bringing together all of the expertise and resources from an array of organizations, this truly collaborative effort enables conservation of grassland SGCN throughout significant portions of their range that would not be otherwise possible.

## COMPLIANCE

The MDNR has already developed methods and processes to comply with state and federal statutes through LIP, our private lands program. Processes are in place to assess Federal compliance issues associated with the National Environmental Policy Act, the Endangered Species Act and the National Historic Preservation Act. Federal compliance is tracked and organized for each project. We strive to streamline procedures while ensuring all requirements have been met. Implementation of this proposal will occur in a manner that does not harm cultural, historical and environmental resources.

### *National Environmental Policy Act (NEPA)*

The activities supported by this grant for this project statement will not have a significant impact on the quality of the human environment. These activities are completely covered by categorical exclusions 1.3 and 1.10 in Appendix 1 to 516 DM Chapter 2 and/or 1.4A(2-3), 1.4B(3-6, 8) and 1.4C(1) in 516 DM Chapter 8.5.

### *Section 7, Endangered Species Act (ESA)*

To maximize long-term survival of federally listed species the MDNR has determined it is necessary to work in occupied habitat. For the federally endangered Karner blue butterfly, all guidelines in Michigan's HCP for Karner Blue butterfly will be followed. For Mitchell's satyr and Eastern massasauga rattlesnake, the MDNR will follow all guidelines that are in our draft HCP for Mitchell's satyr and the draft CCAA for massasauga. In addition, we have established a consultation procedure with the East Lansing Field Office of the USFWS that has resulted in permission to work in occupied habitat on multiple sites for the Mitchell's satyr and Karner blue butterfly in the past. We anticipate that following this process will allow us to meet compliance requirements and manage occupied habitat for activities proposed under this grant.

### *National Historic Preservation Act (NHPA)*

Many of the proposed conservation actions will not have a negative effect on sites that are listed or potentially eligible for listing on the National Register of Historic Places. These would include those activities on lands that have been in active agriculture in the past 50 years and do not involve soil disturbance below normal plow depth. This includes plowing, seeding using no-till drill, culti-packing, hand clearing of brush and trees and prescribed fire for those areas with no structures more than 50 years old present. For sites that have not been in active agriculture in the past 50 years and those activities likely to disturb the soil below the average plow depth, the State Historic Preservation Officer will be contacted and a site specific Section 106 review will be prepared.

### *Other Federal Compliance Issues*

The activities supported by this grant for this project statement do not involve any other federal compliance issue. MDNR will comply with all applicable Federal laws, regulations and policies including but not limited to Coastal Zone Management Act of 1972, Executive Order 11987 Exotic Organisms, Floodplains and Wetlands Protection, Animal Welfare Act of 1985 and Coastal Barriers Resources Act of 1982.

## RANKING CRITERIA SUMMARY

### *Organizational Capacity Criteria*

1. MDNR has a proven record of coordinating all aspects of conservation projects and working with partners and landowners. MDNR staff is integrally involved in many formal and informal wildlife or habitat teams or work groups which facilitate the development of common procedures, data sharing, monitoring and reporting results. **Approach (pgs. 10-14)**
2. MDNR biologists working on public and private lands have a long history of implementing habitat practices for SGCN. Our private lands biologists are dedicated mainly to restoring habitat for SGCN. Through LIP, the MDNR has relied on private contractors to conduct on-the-ground projects and has strong working relationships with these contractors. **Appendix C, Approach (pg. 12) and Monitoring (pg. 14)**
3. MDNR has already developed methods to comply with state and federal statutes on private and public lands. Our staff has developed a process to assess Federal compliance issues associated with NEPA, ESA and the NHPA. We strive for streamlining procedures while ensuring requirements are met as well as tracking project compliance. **Compliance (pg. 15-16)**
4. All compliance needs for project implementation will be addressed within 6 months upon grant award and before spring field implementation. **Compliance (pgs. 15-16)**
5. Non-federal match is 31% and our partners (PF, TNC, MNFI, NWTF and DU) will provide a non-federal match of \$138,500, which is 36% of the non-federal match, letters of commitment or support are attached. **Budget section (pg. 18-20) and Appendix F**

### *Need*

1. Conservation needs, as identified in Michigan's WAP are: 1) control of invasive species 2) management for habitat fragmentation, 3) lost of fire as a natural processes. These needs directly connect to the proposed objectives and conservation actions. **Needs section (pgs. 2-7)**
2. MDNR will work with MDARD and CD to provide technical assistance to landowners and provide implementation support. MDNR and TNC will both conduct on-the-ground work. NWTF, PF and DU will provide program support and program promotion and NWTF and PF will provide seed and equipment. MNFI will provide support in program implementation and monitoring. **Approach (pgs. 10-12)**
3. We will implement specific conservation actions that will improve habitat for the Karner blue butterfly, Henslow and grasshopper sparrows, Northern Harrier and 112 other SGCN (Appendix A). **Needs (pg. 5) and Approach (pgs. 10-12)**
4. We will restore/improve 1,750 acres of prairie, savanna, and grasslands in four specific focus areas consisting of 12 counties. These areas were chosen based on past GIS-based analysis of multiple criteria. **Appendix B and Approach (pgs. 10-12).**

### *Objectives*

Objective 1. Restore/enhance at least 400 acres of prairie, savanna and grasslands.

Objective 2. Plant at least 1,350 acres of native grasses and forbs.

Objective 3. Write a conservation plans for 35 sites.

Objective 4. At least 69% of actions on private lands. **Objectives (pgs. 8-9)**

### *Expected Results and Benefits*

1. Short-term benefits for SGCN and habitats will be improved habitat quality, increased suitable habitat and habitat connectivity for the Karner blue butterfly, Henslow's and grasshopper sparrow and northern harrier. **Results and Benefits (pg. 9)**

2. The long-term benefits for SGCN and their habitats will be improved population viability, maintain stable populations of Karner blue butterfly, Henslow's sparrow, grasshopper sparrow and northern harrier and prevent federal listing of other SGCN. More detail on the long-term benefits for SGCN or their habitats can be found in the **Results and Benefits (pg. 9)**

### *Approach*

1. MDNR and partners will restore, create or enhance prairies, savanna, and grasslands in SLP of Michigan. Conservation plans will be developed to determine appropriate action, such as invasive species control, prescribed fire, setting back succession (mechanical treatment), working with private landowners and maintaining and rehabilitating natural corridors. **Approach (pgs. 10-12)**

2. Match partners include PF, NWTF, TNC, DU and the MNF; and are providing 36% of the total cost of the Application for Federal Assistance and 11% of the total grant. In addition our partners will play a pivotal role in implementing conservation actions on our proposed projects. **Appendix F, Approach (pg. 10-12) and Budget (pg. 18-20)**

3. Of the 1,750 acres of prairie, savanna, and grassland to be restored, enhanced or to be created at least 1,200 acres or 69% will be on private lands, including TNC lands. **Objectives (pg. 8-9)**

4. This proposal will fund work on state and local municipality lands, such as township lands. **Approach (pgs. 10-12) and Appendix F.**

5. A monitoring plan is described in the approach section that details a process for monitoring baseline conditions and habitat changes, and population sampling for SGCN. Monitoring procedures include: photo points, plot sampling, course metrics, presence/absence surveys, line-transects, or census surveys. **Approach (pg. 14).**

6. The MDNR will compile annual performance reports that document progress toward meeting grant objectives. Where progress toward accomplishing short-term and long-term benefits is determined to be unsatisfactory, adaptive management strategies will be used to ensure goals and objectives are met. **Approach (pg. 15).**

## **BUDGET**

### *Fiscal Administrative Procedures*

The MDNR will implement specific fiscal procedures for each conservation project. When the MDNR, partner or private landowner agrees to implement a project to benefit SGCN, both will sign a Landowner Agreement (Appendix D). This Agreement is an approved legal contract

between the State of Michigan and the partner or private landowner. The Agreement references the Project Description (Appendix E), which contains specific contractual items that identifies the scope of the project, conservation actions to be implemented and the commodities and services necessary to complete the project. Once the Landowner Agreement has been signed and the Project Description form completed, the project will be implemented.

To ensure fiscal and contractual accountability, each project will be reviewed and certified by a MDNR biologist before funds will be released. The MDNR biologist ensures the project has adhered to the terms of the Landowner Agreement and Project Description. For example, invasive species treatments will be evaluated to ensure appropriate species and locations where treated with approved techniques. If any deviation is found, the MDNR biologist will make sure projects are corrected and implemented appropriately.

*Non-federal Cost Sharing*

The MDNR will coordinate and cooperate with partners to implement this proposal. In cooperation with our partners, we will provide 31% or \$388,500 in non-federal match. Exactly 64% of non-federal match (\$250,000) will come directly from MDNR, and the remaining 36% of non-federal match (\$138,500) will come from partners other than the MDNR, including Michigan Pheasants Forever, Michigan Chapter of The Nature Conservancy, Ducks Unlimited and the National Wild Turkey Federation. Michigan State University Extension, Michigan Natural Features Inventory will waiver their indirect cost as part of their match. In addition to their significant financial contribution, these partners will play a pivotal role in implementing conservation actions as proposed. Letters of commitment detail the non-federal match contributions from each partner (Appendix F). The sources of non-federal funds are as follows:

Contributors	Match Provided
Michigan Pheasants Forever	\$30,000
The Nature Conservancy (Michigan Chapter)	\$30,000
Michigan Natural Features Inventory (MSU-e)	\$39,000
National Wild Turkey Federation	\$30,000
Ducks Unlimited	\$9,500
MDNR, Wildlife Division	\$250,000
<b>TOTAL</b>	<b>\$388,500</b>

*Estimated Costs and Accomplishments by Objective*

The estimated total cost and planned accomplishments by objectives are as follows:

Objectives	Planned Accomplishments	Reporting Units	Estimated Cost
1. Restoration of Prairies, Savannas and Grasslands	400	Acres	\$420,512
2. Planting of Native Grasses and Forbs	1350	Acres	\$626,420
3. Conservation Plans	35	Plans	\$206,257

4. Private Lands Management	1200	Acres	Included in 1 and 2
<b>Project Total</b>			<b>\$1,253,189</b>

This grant proposal covers salaries and wages, contractual services, travel, supplies and equipment. These estimated costs will be expended according to the following direct cost categories:

Salaries and Wages		\$274,767
Fringe Benefits (48%)		\$131,888
	<b>Salary Sub-total</b>	<b>\$406,654</b>
Indirect Rate (17.87%)		\$72,669
	<b>Total Salaries</b>	<b>\$479,324</b>
Contracts		\$450,000
Equipment		\$0
Travel		\$4,000
Supplies, Services, and Materials		\$316,616
	<b>Project Sub-total</b>	<b>\$1,249,940</b>
Indirect for Audit (0.26%)		\$3,250
	<b>TOTAL COST</b>	<b>\$1,253,189</b>
	Federal Share:	\$864,689
	Other Share:	\$138,500
	State Share:	\$250,000

#### *Salaries and Wages*

The salaries and wages portion of this grant will be used for MDNR biologists to coordinate all aspects of conservation projects with our partners and private landowners.

#### *Contracts*

Contractual grant funds will be used for contracts with Michigan Department of Agriculture and Rural Development, local Conservation Districts and MNFI to provide technical assistance to landowners, on-the-ground implementation of conservation actions and all monitoring activities conducted in prairies, savannas, and grasslands. Funds will also be used to contract MNFI to support monitoring efforts.

#### *Travel Equipment, Supplies and Materials*

These grant funds will be used by the MDNR biologists and our partners to purchase necessary supplies and materials to implement conservation projects. In addition, travel funds will be used by the MDNR biologist to coordinate all conservation projects.

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APPENDIX A. SGCN expected to benefit from prairie, savanna, and grassland restoration in Michigan.

Michigan's Species of Greatest Conservation Need associated with prairies, savanna and grasslands			
Common Name	Scientific Name	state	federal
smallmouth salamander	Ambystoma texanum	E	
eastern tiger salamander	Ambystoma tigrinum tigrinum		
Fowler's toad	Bufo fowleri		
western chorus frog	Pseudacris triseriata triseriata		
pickerel frog	Rana palustris		
northern leopard frog	Rana pipiens	SC	
southern bog lemming	Synaptomys cooperi		
spotted turtle	Clemmys guttata	T	
Kirtland's snake	Clonophis kirtlandii	E	
Blanding's turtle	Emydoidea blandingii	SC	
wood turtle	Glyptemys insculpta	SC	
copperbelly watersnake	Nerodia erythrogaster neglecta	E	(PS:LT)
eastern fox snake	Pantherophis gloydi	T	
queen snake	Regina septemvittata	SC	
eastern massasauga	Sistrurus catenatus catenatus	SC	C
eastern box turtle	Terrapene carolina carolina	SC	
Cooper's Hawk	Accipiter cooperii		
Northern Goshawk	Accipiter gentilis	SC	
Henslow's Sparrow	Ammodramus henslowii	E	
Grasshopper Sparrow	Ammodramus savannarum	SC	(PS)
Blue-winged Teal	Anas discors		
Short-eared Owl	Asio flammeus	E	
Upland Sandpiper	Bartramia longicauda		
American Bittern	Botaurus lentiginosus	SC	
Chuck-will's-widow	Caprimulgus carolinensis		
Killdeer	Charadrius vociferus		
Common Nighthawk	Chordeiles minor		
Northern Harrier	Circus cyaneus	SC	
Sedge Wren	Cistothorus platensis		
Yellow-billed Cuckoo	Coccyzus americanus		(PS)
Northern Flicker	Colaptes auratus		
Northern Bobwhite	Colinus virginianus		(PS)
Bobolink	Dolichonyx oryzivorus		
Least Flycatcher	Empidonax minimus		
Yellow-breasted Chat	Icteria virens		
Northern Shrike	Lanius excubitor		
Migrant Loggerhead Shrike	Lanius ludovicianus migrans	E	
Red-headed Woodpecker	Melanerpes erythrocephalus		
Northern Mockingbird	Mimus polyglottos		

Michigan's Species of Greatest Conservation Need associated with prairies, savanna and grasslands			
Common Name	Scientific Name	state	federal
Savannah Sparrow	<i>Passerculus sandwichensis</i>		
Eastern Towhee	<i>Pipilo erythrophthalmus</i>		
Vesper Sparrow	<i>Poocetes gramineus</i>		
Purple Martin	<i>Progne subis</i>		
American Woodcock	<i>Scolopax minor</i>		
Dickcissel	<i>Spiza americana</i>	SC	
Field Sparrow	<i>Spizella pusilla</i>		
Eastern Meadowlark	<i>Sturnella magna</i>		
Western Meadowlark	<i>Sturnella neglecta</i>	SC	
Brown Thrasher	<i>Toxostoma rufum</i>		
Eastern Kingbird	<i>Tyrannus tyrannus</i>		
Barn Owl	<i>Tyto alba</i>	E	
Blue-winged Warbler	<i>Vermivora pinus</i>		
a tiger beetle	<i>Cicindela limballis</i>		
dusted skipper	<i>Atrytonopsis hianna</i>	SC	
pipevine swallowtail	<i>Battus philenor</i>	SC	
three-staff underwing	<i>Catocala amestris</i>	E	
quiet underwing	<i>Catocala dulciola</i>	SC	
gorgone checkerspot	<i>Chlosyne gorgone carlota</i>	SC	
wild indigo duskywing	<i>Erynnis baptisiae</i>	SC	
persius duskywing	<i>Erynnis persius persius</i>	T	
northern hairstreak	<i>Fixsenia favonius ontario</i>	SC	
barrens buckmoth	<i>Hemileuca mala</i>	SC	
otloe skipper	<i>Hesperia otloe</i>	T	
Henry's elfin	<i>Incisalla henrici</i>	T	
frosted elfin	<i>Incisalla irus</i>	T	
Karner blue	<i>Lycaeides melissa samuelis</i>	T	LE
Newman's brocade	<i>Meropleon ambifusca</i>	SC	
Mitchell's satyr	<i>Neonympha mitchellii mitchellii</i>	E	LE
poweshiek skipperling	<i>Oarisma poweshiek</i>	T	
blazing star borer	<i>Papaipema beeriana</i>	SC	
golden borer	<i>Papaipema cerina</i>	SC	
maritime sunflower borer	<i>Papaipema maritima</i>	SC	
Culvers root borer	<i>Papaipema sciata</i>	SC	
silphium borer moth	<i>Papaipema silphii</i>	T	
regal fern borer	<i>Papaipema speciosissima</i>	SC	
tawny crescent	<i>Phycodes batesii</i>	SC	
Sprague's pygarcia	<i>Pygarcia spraguei</i>	SC	
phlox moth	<i>Schinia indiana</i>	E	
leadplant flower moth	<i>Schinia lucens</i>	E	
spartina borer moth	<i>Spartiniphaga inops</i>	SC	
regal fritillary	<i>Speyeria idalia</i>	E	

Michigan's Species of Greatest Conservation Need associated with prairies, savanna and grasslands			
Common Name	Scientific Name	State	Federal
a leafhopper	<i>Dorydiella kansana</i>	SC	
a leafhopper	<i>Flexamia delongi</i>	SC	
Huron River leafhopper	<i>Flexamia huroni</i>	T	
a leafhopper	<i>Flexamia reflexus</i>	SC	
angular spittlebug	<i>Lepyronia angulifera</i>	SC	
great plains spittlebug	<i>Lepyronia gibbosa</i>	SC	
a spittlebug	<i>Philaenarcys kllia</i>		
red-legged spittlebug	<i>Prosapia ignipectus</i>	SC	
woodland camel cricket	<i>Ceuthophilus silvestris</i>		
woodland meadow katydid	<i>Conocephalus nemoralis</i>		
a spur-throat grasshopper	<i>Melanoplus eurycerus</i>		
blue-legged locust	<i>Melanoplus flavidus</i>	SC	
Hebard's green-legged locust	<i>Melanoplus viridiipes</i>		
conehead grasshopper	<i>Neoconocephalus retusus</i>	SC	
tamarack tree cricket	<i>Oecanthus larici</i>	SC	
delicate meadow katydid	<i>Orchelimum delicatum</i>	SC	
barrens locust	<i>Orphulella pelidna</i>	SC	
Atlantic-coast locust	<i>Psinidia fenestralis</i>	SC	
least shrew	<i>Cryptotis parva</i>	T	
red bat	<i>Lasiurus borealis</i>		
hoary bat	<i>Lasiurus cinereus</i>		
prairie vole	<i>Microtus ochrogaster</i>	E	
woodland vole	<i>Microtus pinetorum</i>	SC	
least weasel	<i>Mustela nivalis</i>		
northern bat or northern myotis	<i>Myotis septentrionalis</i>		
Indiana bat or Indiana myotis	<i>Myotis sodalis</i>	E	LE
evening bat	<i>Nycticeius humeralis</i>	T	
eastern pipistrelle	<i>Pipistrellus subflavus</i>	SC	
six-lined racerunner	<i>Aspidoscelis sexlineata</i>	T	
blue racer	<i>Coluber constrictor foxii</i>		
northern ringneck snake	<i>Diadophis punctatus edwardsii</i>		
eastern hognose snake	<i>Heterodon platirhinos</i>		
smooth green snake	<i>Liochlorophis vernalis</i>		
black rat snake	<i>Pantherophis spiloides</i>	SC	

