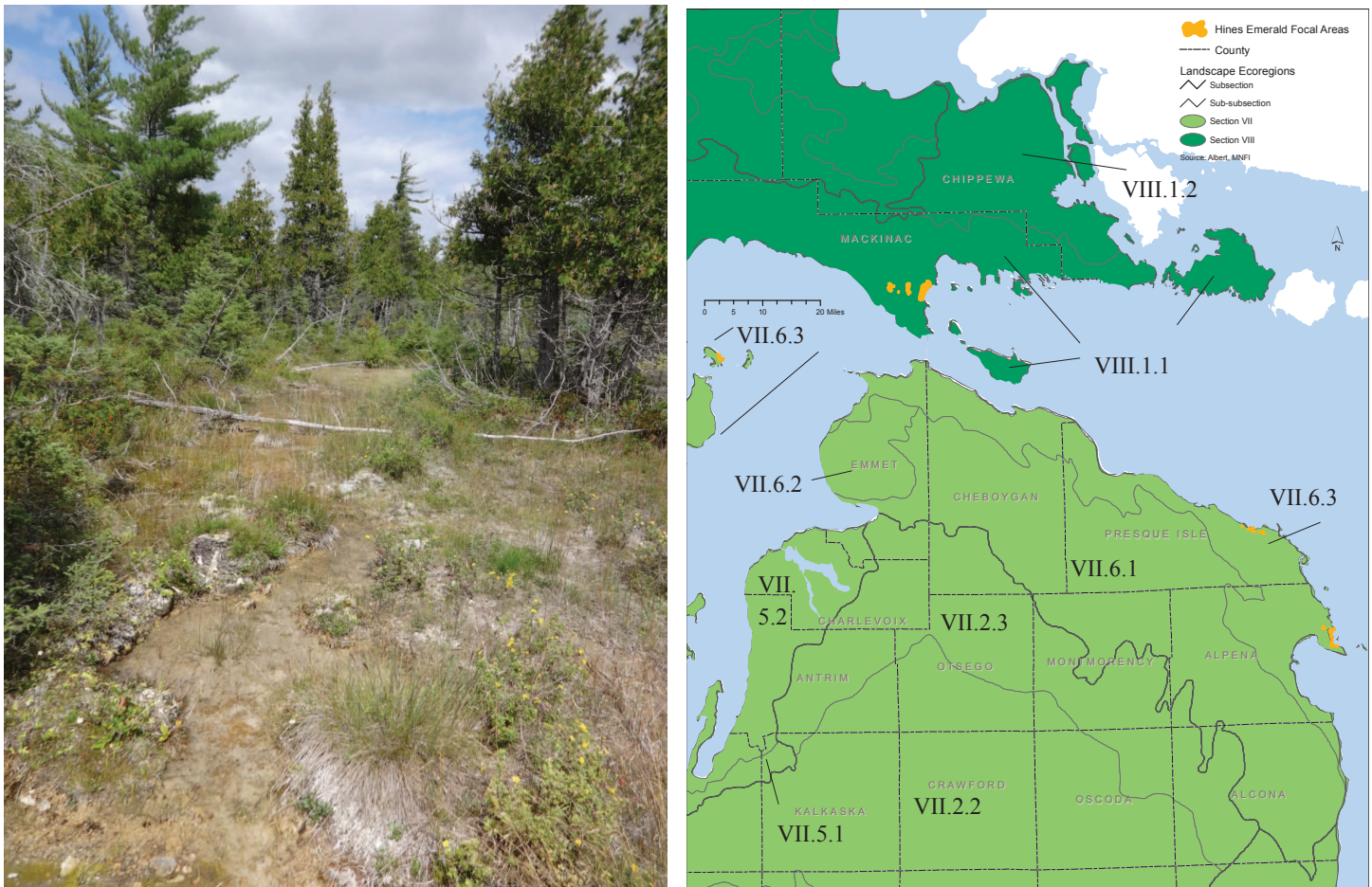# Development of a Preliminary Focal Area Network for the Wildlife Action Plan

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ACKNOWLEDGMENTS

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INTRODUCTION

The Wildlife Division (WLD) of the Michigan Department of Natural Resources is currently revising the Michigan Wildlife Action Plan. As part of this process, WLD has identified a set of Focal Species for which they will focus their conservation actions and also a set of Priority Species that will benefit from these actions. In 2014, WLD commissioned Michigan Natural Features Inventory (MNFI) to assist with the process of selecting potential Focal Areas to concentrate finite resources for management for these Focal Species in priority landscapes and increase the likelihood of long-term success of conservation efforts. This project involved three components: an evaluation of element occurrence Focal and Priority Species and intersecting high-quality natural communities, survey for prioritized species and natural communities, and the identification of potential Focal Areas through GIS analysis, prioritized scoring, and data interpretation. This report summarizes these efforts of MNFI to develop a network of potential Focal Areas.

METHODS

Element Occurrence Updates

The WLD provided MNFI scientists with a list of 26 Focal Species and 68 Priority Species. MNFI zoologists updated element occurrences (EOs) of these Focal Species and a subset of Priority Species using MNFI's Biotics database. At a minimum, updates involved evaluation of the EO rank of each EO but may have required more involved effort depending on the record. Additional updating tasks included remapping of EO polygons, merging of EOs, updating last observed survey date, and incorporating new survey information and populating fields summarizing survey data about the species.

Using the list of Focal Species and Priority Species, we intersected these species with MNFI's EO database of high-quality natural communities to prioritize natural community EO updates. In addition, natural community EOs surveyed during and after 2006 were also targeted for updating. In 2006, MNFI ecologists standardized the information collected during ecological surveys. Natural community EO updates involved evaluating EO ranks and natural community classification, and where necessary remapping EO polygons and populating fields summarizing ecological survey data, threats, and management recommendations.

Rare Species Survey Prioritization

This project had limited resources identified for field surveys. Therefore, rare animal species were selected and prioritized by two approaches, 1) those species which have a high degree of overlap with a natural community, and 2) those animal EOs that had the best opportunity to update multiple species (e.g. lupine feeding lepidpoterans). For both approaches, survey effort was further prioritized by revisiting those EOs that were ranked as H (historical), thus indicating the need for more recent surveys. Sites prioritized for survey included bogs which previously supported or were likely to support populations of the Michigan endemic secretive locust (*Appalachia arcana*) and lakeplain prairies that supported rare Papaipema moths. In addition, oak-pine barrens and dry sand prairies that support the three lupine feeding lepidopterans, Karner blue butterfly (*Lycaeides melissa samuelis*), frosted elfin (*Incisalia irus*), and persius duskywing (*Erynnis persius persius*), were selected for surveys.

Natural Community Survey Prioritization

Following the intersection of Focal Species and Priority Species, a scoring matrix was developed to prioritize survey effort for natural communities. For natural communities that intersected with Focal or Priority Species we also determined if those natural communities occurred within Core Design Team Recommendation Areas (CDTRAs), proxies for functional landscapes identified by the DNR's Biodiversity Planning Process/Living Legacies Project. In addition, for each natural community type we developed a crosswalk identifying which

Focal and Priority Species occur, and could potentially occur, within that community type. For each natural community EO, a score was assigned for the following criteria: natural community EO rank (higher scores for higher ranked EOs), species EO rank (higher scores for higher ranked EOs), last survey date (higher scores for older records), S Rank or State Element Rank (higher scores for rarer types), diversity score (higher scores for natural community EOs that intersect with more Focal and Priority Species), crosswalk score (higher scores for natural communities that potentially support more Focal and Priority Species), compatible management score (higher scores for lands that have a greater likelihood of management for Focal and Priority Species), and Core Design Team Recommendation Area Score (higher scores for CDTRAs that capture greater numbers of Focal and Priority Species). The sum of these scores was calculated to sort the natural community EOs based on their survey prioritization score and the highest ranked sites were selected for survey. Sites prioritized for survey included northern fens that support Hine's emerald (*Somatochlora hineana*), oak-pine barrens and dry sand prairie that support Karner blue (*Lycaeides melissa samuelis*), and prairie fens that support a diversity of focal species including Mitchell's satyr (*Neonympha mitchellii mitchellii*), tamarack tree cricket (*Oecanthus laricis*), and eastern massasauga (*Sistrurus catenatus catenatus*).

Identification of Potential Focal Areas

Following surveys for prioritized species and natural communities and updating the above-mentioned EOs, we began the process of identifying potential Focal Areas. This process began with an updated GIS intersection of Focal Species and Priority Species EOs with natural community EOs and CDTRAs. Following this intersection, we developed a scoring matrix to facilitate the ranking of species EOs, natural community EOs, and CDTRAs for each Focal Species as well as Priority Species. For each Focal Species EO and Priority Species EO, a score was assigned for the following criteria: species EO rank (higher scores for higher ranked species EOs), natural community EO rank (higher scores for higher ranked natural community EOs), natural community EO (higher scores for natural community EOs that intersect with more Focal and Priority Species), diversity score (higher scores for natural community types that potentially support more Focal and Priority Species), and Core Design Team Recommendation Area Score (higher scores for CDTRAs that capture greater numbers of Focal and Priority Species). The sum of these scores was calculated to determine a Focal Area score for each EO for all of the Focal and Priority Species (**See Digital Appendix 1**). These Focal Area scores were used to sort the EOs for each Focal Species and Priority Species. Using the ranking as a guide, MNFI scientists then selected at least five EOs per Focal Species to evaluate spatially in a GIS environment. For species EOs selected for evaluation, the intersecting natural community EOs and CDTRAs were also selected for evaluation given that what is an appropriate Focal Area boundary varies from species to species and may correspond with the species EO, the natural community EO, the intersection of the species and natural community EO, the intersection of the species EO and the CDTRA, the CDTRA, or some other configuration centered around the species EO. In some instances, we delineated new polygons as the proposed Focal Areas based on air photo interpretation and centered around the species EO of interest.

MNFI scientists evaluated the preliminary set of Focal Areas for each Focal Species within a GIS environment. For each species we started by examining the full distribution of the species by zooming to the full set of EOs for that species. This allowed us to make sure that our set of proposed Focal Areas captured the regional variability of the species. We examined each species EO, natural community EO, or CDTRA identified by our ranking procedure and evaluated what the best potential Focal Area polygon should be on a case by case basis. For each of the Focal Species we selected a set of proposed Focal Areas based on species EO polygons, natural community EO polygons, and/or CDTRA polygons. When selecting proposed Focal Areas by species, MNFI scientists considered the habitat needs and affinities of the species, the scale of occurrence of the species, regional variability of the species, and whether the Focal Area captured EOs for the Priority Species, especially highly ranked ones. Natural community EOs were typically picked for species that have a high affinity to habitat type (e.g., insects). CDTRAs were often used for habitat generalists (e.g., eastern box turtle and bats) or species that rely on a feature nested within a larger landscape (e.g. common loon and inland lakes, and bats and their hibernacula). Selection of the proposed Focal Areas was informed by air photo interpretation. This set of proposed Focal Areas was compiled in a shapefile (**See Digital Appendix 2**).

We used a slightly modified approach to identify potential Focal Areas for grassland bird species. We found that grassland bird species tended not to intersect with natural community EOs but often intersected with CDTRAs. Grassland bird species that are Focal Species include dickcissel (*Spiza americana*), grasshopper sparrow (*Ammodramus savannarum*), and Henslow's sparrow (*Ammodramus henslowii*). This group of species required modified methods for delineating potential Focal Areas. In addition to examining sites where grassland bird species EOs intersected with CDTRAs, we also developed an intersection of grassland bird EOs with each other and examined the sites where more than one grassland bird species occurs. In addition, because the recorded data for these species is often point data along roads, we either delineated polygons of large grasslands capturing these points or used large grasslands greater than 20 acres within the CDTRA or management area where the EO occurs (e.g., large grasslands within the Sharonville State Game Area and large grasslands within the Fort Custer CDTRA).

For the Priority Species, following ranking of the Priority Species EOs and identification of the proposed Focal Areas, we examined the top ranked Priority Species natural community EOs, species EOs, and CDTRAs to determine whether these sites where captured by the proposed set of Focal Areas. If a Priority Species was not captured by these Focal Areas, we first looked to see if there were high ranked Priority Species natural community EOs, species EOs, and CDTRAs that intersect with Focal Species natural community EOs, species EOs, and CDTRAs not already identified as Focal Areas. If there were, we evaluated these sites for inclusion as Focal Areas. If not, when data was available we followed the same procedure that we followed for the Focal Species in terms of identifying potential Focal Areas. Where data was available for Priority Species we selected a set of proposed Priority Focal Areas based on species EO polygons, natural community EO polygons, and/or CDTRA polygons. This set of proposed Priority Focal Areas was compiled in a second shapefile (**See Digital Appendix 3**). For some Priority Species, there was not sufficient data to select Priority Focal Areas (e.g., some species only have historical records). For these Priority Species we identified the need for current survey effort to evaluate the species status, distribution, and/or habitat needs.

RESULTS

Element Occurrence Updates

A large percentage of the MNFI scientists' time on this project was spent on updating the Focal and Priority Species EOs and intersecting natural community EOs. To make the soundest decisions in terms of Focal Area selection the majority of the species EO ranks had to be updated. In addition, to make the delineated Focal Areas more accurate, many of the Focal Species EOs had to be remapped. A total of 1,002 species EOs were updated (**Table 1**). A total of 690 natural community EOs were updated.

Rare Species Surveys

Rare species surveys focused on bogs which previously supported, or were likely to support, populations of the Michigan endemic secretive locust (*Appalachia arcana*) and lakeplain prairies that supported rare Papaipema moths. In addition, oak-pine barrens and dry sand prairies that support the three lupine feeding lepidopterans, Karner blue butterfly (*Lycaeides melissa samuelis*), frosted elfin (*Incisalia irus*), and persius duskywing (*Erynnis persius persius*) were visited. A total of eight secretive locust EOs were updated and an additional seven bogs were visited and four new EOs for secretive locust were identified (**Table 2**). Two blazing star borer moth EOs and one culver's root borer moth EOs were updated (**Table 2**). In addition, three frosted elfin and two Karner blue EOs were visited and none of the target species were observed. All three of the lupine feeding species should be given high priority for future surveys.

Percent Completed	Focal or Priority Species	Scientific Name	# of EOs assessed
100	Barn owl	*Tyto alba*	5
100	**Black tern**	*Chlidonias niger*	24
100	**Black-crowned night heron**	*Nycticorax nycticorax*	20
100	**Blazing star borer**	*Papaipema beeriana*	28
100	**Cerulean warbler**	*Dendroica cerulea*	59
100	Common moorhen	*Gallinula chloropus*	19
100	**Common tern**	*Sterna hirundo*	87
100	Copperbelly watersnake	*Nerodia erythrogaster neglecta*	15
100	**Dickcissel**	*Spiza americana*	54
40	**Dusted skipper**	*Atrytonopsis hianna*	14
100	**Eastern fox snake**	*Pantherophis gloydi*	43
100	**Eastern pipistrelle**	*Perimyotis subflavus*	12
100	Forester's tern	*Sterna forsteri*	13
100	Frosted elfin	*Incisalia irus*	40
100	**Grasshopper sparrow**	*Ammodramus savannarum*	116
100	**Henslow's sparrow**	*Ammodramus henslowii*	74
100	**Hine's emerald**	*Somatochlora hineana*	15
100	King Rail	*Rallus elegans*	47
100	Lake Huron locust	*Trimerotropis huroniana*	91
100	**Mitchell's satyr**	*Neonympha mitchellii mitchellii*	24
100	**Piping plover**	*Myotis septentrionalis*	48
100	Poweshiek skipperling	*Oarisma poweshiek*	16
75	**Secretive locust**	*Appalachia arcana*	65
100	**Tamarack tree cricket**	*Oecanthus laricis*	53
100	**Yellow Rail**	*Coturnicops noveboracensis*	11
100	**Yellow-throated warbler**	*Dendroica dominica*	9
			1002

Table 1. A summary of rare animal element occurrences updated for this project by Focal Species (in bold) and Priority Species.

Photo 1. Oak-pine barrens and Karner blue habitat, Allegan State Game Area. Photo by Joshua G. Cohen.

Species/Community	EO ID	Survey Site	Old EO RANK	New EO RANK	Focal Species
Blazing Star Borer	12949	Petersburg State Game Area	E	AB	Blazing star borer
Blazing Star Borer	20090	King Road - Danou	-	BC	Blazing star borer
Bog	11974	Best Bog	-		Secretive locust
Bog	1747	Lovells Bog	-		Secretive locust, did not find.
Bog	3463	Vaughn Lake	-		Secretive locust, did not find.
Culver's Root Borer	4297	Petersburg State Game Area	AC	AC	Culver's root borer
Frosted Elfin	3770	Wood Lake South	H	F	Frosted elfin and Karner blue
Frosted Elfin	8622	142 Avenue	E	F	Frosted elfin and Karner blue
Frosted Elfin	10653	Wood Lake Barrens	H	F	Frosted elfin and Karner blue
Karner Blue	13505	142 Avenue Barrens	D	D	Frosted elfin and Karner blue
Karner Blue	12804	Wood Lake Barrens	H	F	Frosted elfin and Karner blue
Secretive Locust	7641	Lake Margrethe North	E	B	Secretive locust
Secretive Locust	2691	Rollway Road Bog	E	BC	Secretive locust
Secretive Locust	12581	M-55 Bog	H	BC	Secretive locust
Secretive Locust	464	Big Frost Pocket South	H	BC	Secretive locust
Secretive Locust	8366	Wells Road	H	H	Secretive locust
Secretive Locust	11	Lake Nettie	H	H	Secretive locust, did not find.
Secretive Locust	6861	Lyons Manor	H	H	Secretive locust (discovered it was incorrectly mapped)
Secretive Locust	9773	Leota	H	H	Secretive locust
Secretive Locust	20094	McGlowerd Road	-	B	Secretive locust (New EO)
Secretive Locust	20092	Rice Pond	-	BC	Secretive locust (New EO)
Secretive Locust	19904	Big Creek Bog	-	BC	Secretive locust (New EO)
Secretive Locust	20093	Best Bog	-	BC	Secretive locust (New EO)

Table 2. A summary of surveys for Focal Species and Priority Species conducted in the 2014 Field Season.

Photo 2. Female secretive locust reconfirmed at Lake Margrethe North. Photo by David L. Cuthrell.

Natural Community Type	EO ID	Survey Site	Old EO RANK	New EO RANK	Focal Species
Dry Sand Prairie	6552	Indian Lake Southwest	B	B	Karner Blue
Dry Sand Prairie	1398	Sischo Prairies	B	BC	Karner Blue
Dry Sand Prairie	10276	Skeel Creek Prairie	B	BC	Karner Blue
Northern Fen	16298	Brevort Lake Road	A	AB	Hine's Emerald
Northern Fen	5747	Horseshoe Bay	A	AB	Hine's Emerald
Northern Fen	13565	Horseshoe Bay - Moran St.	B?	C	Hine's Emerald
Northern Fen	19926	Satago Lake Fen	NA	B	Potential for Hine's Emerald
Northern Fen	5040	Summerby Fen	A	AB	Hine's Emerald
Oak-Pine Barrens	9227	Allegan Oak-Pine Barrens	AB	B	Karner Blue
Oak-Pine Barrens	19950	Sischo Barrens	NA	C	Karner Blue and Eastern Box Turtle
Prairie Fen	1928	Liberty Fen	A	AB	Tamarack Tree Cricket, Mitchell's Satyr, and Eastern Massasauga
Prairie Fen	1003	Ives Road Fen	A	B	Eastern Massasauga

Table 3. A summary of surveys for natural communities conducted in the 2014 Field Season.

Photo 3. Surveys in 2014 resulted in the updating of the element occurrence for northern fen at Summerby Fen. Photo by Joshua G. Cohen.

Natural Community Surveys

Natural community surveys were focused on northern fens that support Hine's emerald populations and dry sand prairies and oak-pine barrens that support Karner blue populations. A total of four northern fen EOs were updated and one new northern fen EO was documented (**Table 3**). A total of three dry sand prairie EOs and one oak-pine barrens EO were updated and one new oak-pine barrens EO was documented (**Table 3**). In addition, two prairie fen EOs that support numerous Focal Species and Priority Species were surveyed and updated (**Table 3**).

Identification of Potential Focal Areas

A total of 201 proposed Focal Areas were identified totaling 1,242,331 non-overlapping acres. These Focal Areas are composed of 1,021 unique animal EOs, 244 unique natural community EOs, and 50 CDTRAs (38 of which are unique and total 1,050,605 acres). The Focal Areas were derived using 14 unique rare animal species EOs, 95 natural community EOs (85 of which are unique), 50 CDTRAs, and 44 delineated polygons (35 of which are unique). The delineated polygons are based on rare animal EOs, natural community EOs, large grassland complexes, and Bois Blanc Island, and correspond to 172,476 non-overlapping acres. Excluding the potential Focal Areas that correspond with CDTRAs and delineated polygons, there are 109 potential Focal Areas (96 of which are unique) that account for 45,947 non-overlapping acres. Twenty-four of the polygons used to choose potential Focal Areas were selected multiple times for more than one Focal Species (**Table 4**).

A total of 72 proposed Priority Focal Areas were identified totaling 181,372 non-overlapping acres. These focal areas are composed of 427 unique animal EOs, 109 unique natural community EOs, 16 CDTRAs (12 of which are unique and total 149,181 acres), and 2 delineated polygons (corresponding to 767 non-overlapping acres). The Priority Focal Areas were derived from 9 unique rare animal species EOs, 31 unique natural community EOs, 12 unique CDTRAs, and 1 unique delineated polygon. Excluding the potential Priority Focal Areas that correspond with CDTRAs and delineated polygons, there are 54 potential Priority Focal Areas (40 of which are unique) that account for 31,424 non-overlapping acres.

A shapefile containing proposed Focal Areas for each Focal Species has been provided (**Digital Appendix 2**). **Figures 1 and 2** illustrate the potential Focal Areas identified for yellow-throated warbler and northern bat. We have also provided a shapefile of proposed Priority Focal Areas (**Digital Appendix 3**). **Figure 3** illustrates the full set of proposed Focal Areas and Priority Focal Areas.

For each potential Focal Area and Priority Focal Area we have identified what polygon triggered the selection of the area, the animal species that occur within the area (with Focal Species and Priority Species highlighted), and also what natural communities and CDTRAs occur within the area. This information is summarized in tabular format in **Digital Appendices 4 and 5**. **Table 5** shows the summarized information for Black Tern Focal Area 4. **Digital Appendices 4 and 5** also provide the following summary statistics for each potential Focal Area and Priority Focal Area: total acreage, total number of EOs, total number of Focal and Priority Species EOs, total number of unique Focal and Priority Species, and the ratio of total EOs to acreage.

After completing the selection of potential Focal Areas we assessed the number of Focal Species EOs captured by the potential Focal Areas and compared these numbers to the total number of EOs by Focal Species (**Table 6**). The percentage of rare species occurrences captured by the Focal Areas ranged from 15% (secretive locust) to 100% (Hine's emerald dragonfly), and all but four species (secretive locust, Karner blue, dusted skipper, and grasshopper sparrow) had 20% or more of their occurrences captured by the network of potential Focal Areas.

For each Focal Species we provide a discussion of how the Focal Areas were identified and what were the driving factors for selecting these Focal Areas. This information is summarized in **Appendix 1**. For each Priority Species we provide a discussion of whether or not the species is captured by an existing Focal Area and if so, which one. If the Priority Species is not captured by an existing Focal Area we either suggest adding an additional Priority Focal Area or explain why it might not be captured (e.g., more surveys are needed for the species, all species records are historical). This information is summarized in **Appendix 2**.

Focal Area Polygon	Focal Species
Allegan Core CDTRA	Eastern Box Turtle Northern Bat
Barry Yankee Springs CDTRA	Common Loon Eastern Box Turtle
Fort Custer CDTRA	Eastern Box Turtle Eastern Pipistrelle
Howes Lake Prarie CDTRA	Eastern Massasauga Secretive Locust
Huron Mountains CDTRA	Common Loon Northern Bat
Lower Manistee wetland complex CDTRA	Eastern Pipistrelle Indiana Bat
North Pointe_Rockport CDTRA	Eastern Pipistrelle Northern Bat
Porcupine Mountains CDTRA	Eastern Pipistrelle Northern Bat
Portage Marsh CDTRA	Black-Crowned Night Heron Common Tern Yellow Rail
Floodplain Forest 13369 (Sarett Nature Center)	Cerulean Warbler Eastern Massasauga
Pine Barrens 15942 (Shupac Lake Barrens)	Dusted Skipper Kirtland's Warbler
Pine Barrens 17323 (Frost Pocket Pine Barrens)	Dusted Skipper Secretive Locust
Prairie Fen 12498 (Shaw Lake Fen)	Eastern Massasauga Tamarack Tree Cricket
Prairie Fen 1928 (Liberty Fen)	Blazing Star Borer Eastern Massasauga Mitchell's Satyr Tamarack Tree Cricket
Prairie Fen 327 (Park Lyndon Fen)	Eastern Massasauga Tamarack Tree Cricket
Prairie Fen 7579 (Hill Creek Fen)	Blazing Star Borer Eastern Massasauga Tamarack Tree Cricket
Common Tern 3827 (Delineated Polygon)	Common Tern Piping Plover
Dickcissel 16113 (Delineated Polygon)	Grasshopper Sparrow Henslow's Sparrow Dickcissel
Dusted Skipper 88 (Delineated Polygon)	Karner Blue Dusted Skipper
Large grasslands in Deford State Game Area (Delineated Polygon)	Dickcissel Grasshopper Sparrow
Large grasslands in Ionia State Recreation Area (Delineated Polygon)	Dickcissel Grasshopper Sparrow Henslow's Sparrow
Large grasslands in Pinckney Waterloo CDTRA (Delineated Polygon)	Grasshopper Sparrow Henslow's Sparrow
Large grasslands in Sharonville State Game Area (Delineated Polygon)	Grasshopper Sparrow Henslow's Sparrow

Table 4. Focal Area polygons used to identify potential Focal Areas that were selected multiple times for more than one Focal Species

| Potential Focal Area	EO_ID	Species	Common Name	EO Rank	Site Id	CDTRA Name
Black Tern 4	120	Clemmys guttata	Spotted turtle	E		
	1460	Haliaeetus leucocephalus	Bald eagle	H		
	3845	Clemmys guttata	Spotted turtle	E		
	4018	**Great Lakes Marsh**		A		
	5006	Lakeplain Oak Openings		BC		
	8619	Acipenser fulvescens	Lake sturgeon	H		
	10348	Sterna hirundo	Common tern	H		
	11645	Rallus elegans	King rail	H		
	12439	Sterna forsteri	Forster's tern	CD		
	13527	Botaurus lentiginosus	American bittern	B		
	13530	Ixobrychus exilis	Least bittern	BC		
	13533	Gallinula chloropus	Common moorhen	B		
	13541	Chlidonias niger	Black tern	BC		
	17389	Cistothorus palustris	Marsh wren	B		
	17412	Emydoidea blandingii	Blanding's turtle	C		
					SLP43	St. Clair Delta

Table 5. A summary of the elements captured by an example potential Focal Area, Black Tern Focal Area 4. Focal Species are highlighted in green, Priority Species are highlighted in blue, and the polygon that drove the selection of the potential Focal Area is underlined and in bold (Great Lakes Marsh EO 4018). This information is provided for all potential Focal Areas in **Digital Appendix 4**.

Focal Species		Status				All Occurrences by EO Rank							Ocurrences by EO Rank in Focal Areas						
Common Name	Bin Codes	GR	SR	F	S	#	A	B	C	D	H	Other	#	%	A	B	C	D	H	Other
Black tern	4	G4	**S2**		SC	24	0	9	8	2	5	0	12	50%	0	7	2	1	2	0
Black-crowned night-heron	4,9	G5	S3		SC	20	0	0	4	1	14	1	8	40%	0	0	4	1	3	0
Blazing star borer	6	G2G3	**S2**		SC	30	2	18	6	0	3	1	16	53%	2	11	2	0	1	0
Cerulean warbler	9	G4	S3		T	59	2	11	25	18	3	0	18	31%	2	7	6	3	0	0
Common loon	1	G5	S3		T	500	2	0	0	0	158	340	98	20%	1	0	0	0	54	43
Common tern	3	G5	**S2**		T	88	0	10	13	1	64	0	19	22%	0	3	2	0	14	0
Dickcissel	7	G5	S3		SC	54	0	0	3	43	2	6	12	22%	0	0	2	8	2	0
Dusted skipper	8	G4G5	S3		SC	56	4	11	4	0	13	24	10	18%	1	3	0	0	3	3
Eastern box turtle	4,5,6	G5	S2S3		SC	292	15	8	2	1	82	184	75	26%	14	4	0	1	10	46
Eastern fox snake	4,6	G3TNR	**S2**		T	43	0	8	12	6	14	3	24	56%	0	8	5	2	5	4
Eastern massasauga	1,4,5,6,8,9	G3G4	S3	C	SC	275	24	59	71	8	53	60	69	25%	13	18	10	0	14	14
Eastern pipistrelle	2	G3	**S1**		SC	12	4	3	1	1	2	1	6	50%	2	3	0	0	0	1
Grasshopper sparrow	6,7	G5	S4		SC	116	0	11	48	56	1	2	20	17%	0	5	6	8	1	0
Henslow's sparrow	6,7	G4	S3		E	74	0	0	9	59	1	5	16	22%	0	0	4	11	1	0
Hine's emerald	5	G2G3	**S1**	E	E	15	2	4	7	2	0	1	15	100%	2	4	7	2	0	0
Indiana bat	2,9	**G2**	**S1**	E	E	25	1	1	0	1	13	9	7	28%	1	0	0	1	3	2
Karner blue	6	G5T2	**S2**		T	189	15	12	11	53	33	65	32	17%	11	2	3	8	3	5
Kirtland's warbler	8	G3G4	S3		E	43	0	1	2	1	1	38	10	23%	0	1	1	0	0	8
Mitchell's satyr	5	**G2**	**S1**		E	24	1	2	3	5	3	10	12	50%	1	2	3	3	0	3
Northern bat	2	G2G3	**S1**	PE	_	67	0	0	0	0	14	53	17	25%	0	0	0	0	0	17
Piping plover	3	G3	S2	E	E	48	1	5	15	13	13	1	17	35%	1	4	7	4	1	0
Rusty-patched bumble bee	6	**G1**	SNR		SC	0	0	0	0	0	0	0	0	0%	0	0	0	0	0	0
Secretive locust	8	G2G3	S2		SC	65	0	23	11	1	15	15	10	15%	0	6	0	0	4	0
Tamarack tree cricket	5,9	**G1G2**	S3		SC	53	5	21	19	3	2	3	25	47%	5	14	4	1	1	0
Yellow rail	5	G4	**S2**		T	11	0	2	7	0	2	0	9	82%	0	2	5	0	2	0
Yellow-throated warbler	9	G5	S3		T	9	1	1	3	2	0	2	5	56%	1	1	3	0	0	0

Table 6. Total number of EOs tallied by EO ranks by Focal Species compared to number of Focal Species EOs tallied by EO ranks captured by the potential Focal Areas. Federally listed species or candidates for listing are in bold.

Figure 1. Potential Focal Areas identified for yellow-throated warbler.
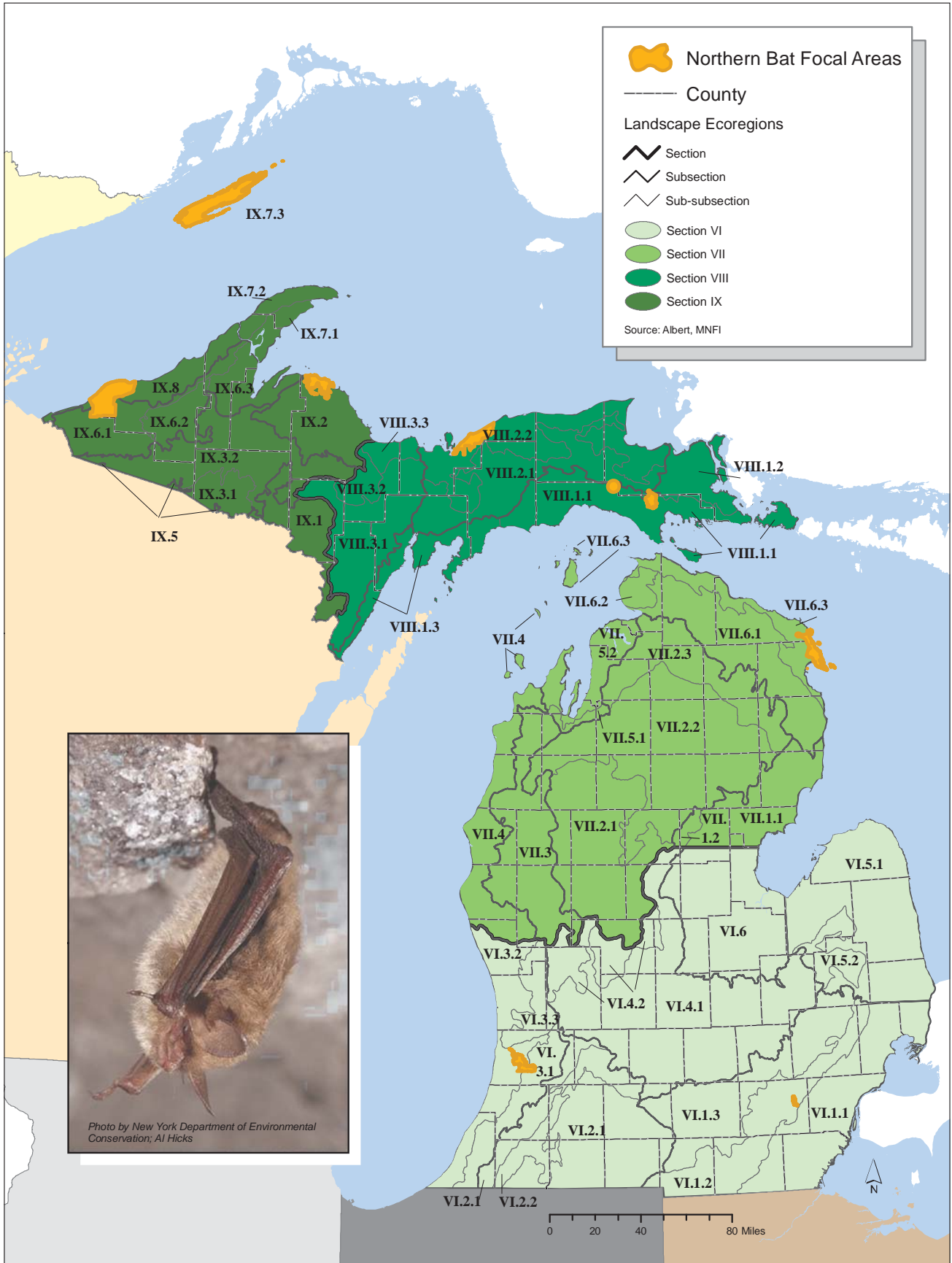
Figure 2. Potential Focal Areas identified for northern bat.
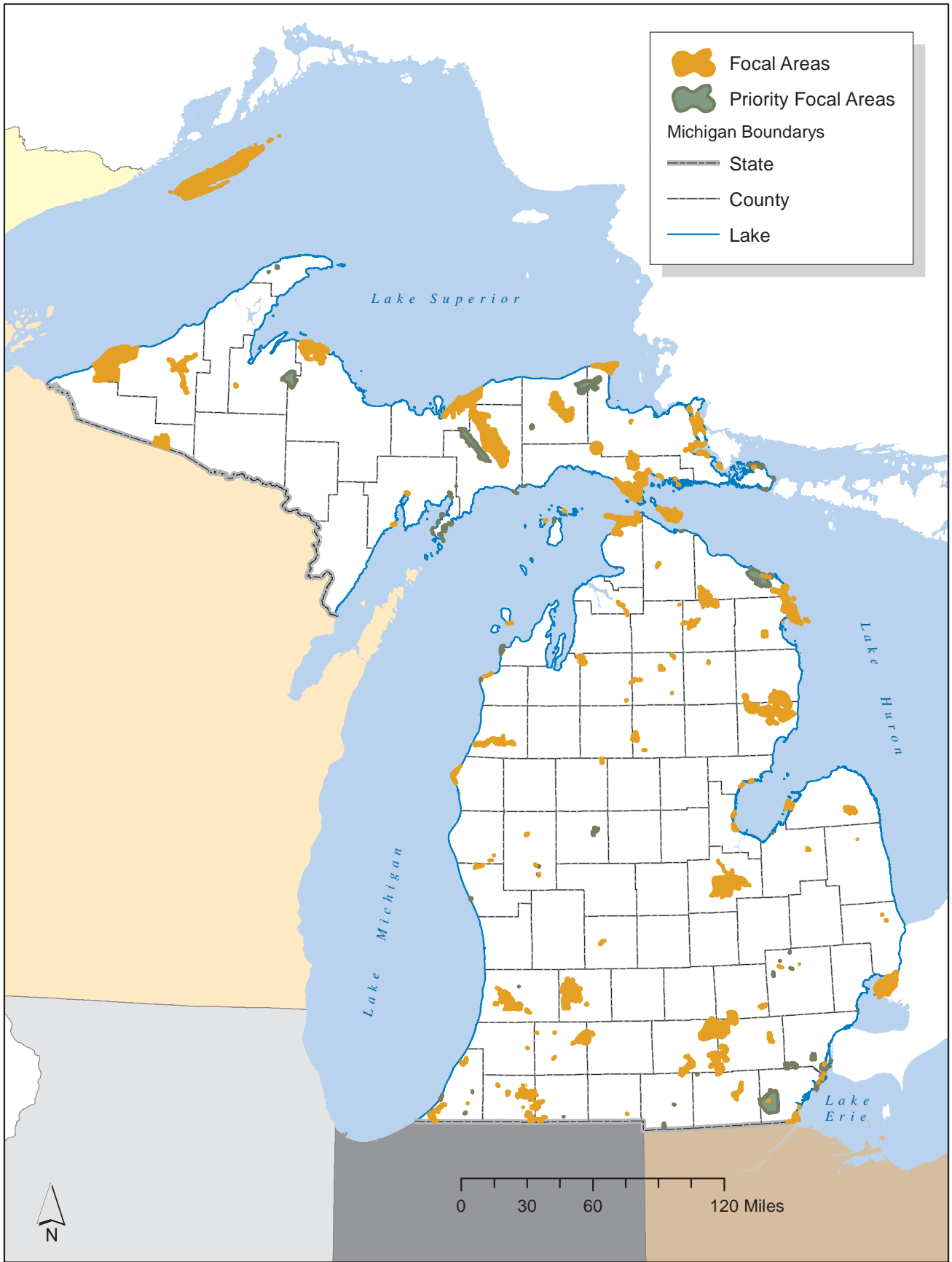
Figure 3. Full set of proposed Focal Areas and Priority Focal Areas.

DISCUSSION

This project has resulted in the development of a preliminary network of Focal Areas. This network of potential Focal Areas should not be viewed as finalized or exclusive. Input from DNR staff and stakeholders participating in ongoing research and management for Focal and Priority Species should help refine the proposed network. This network could be further modified through the following activities: continued evaluation of the element occurrence data for Focal Species and Priority Species that were not analyzed for this project; analysis of rare plant element occurrences by potential Focal Area; surveys for Focal Species, Priority Species, and natural communities that were identified as occurring in proposed Focal Areas; and development of inferred extent layers and species distribution models for select species or suites of species. Two pressing needs were identified by this project: 1) the need to complete element occurrence updates for those Focal Species and Priority Species EOs that were not evaluated; and 2) the acute need for surveys and research for many of the Focal and Priority Species. No element occurrence data exists for the rusty patched bumble bee and half of the Priority Species (34 of the 68) need more survey effort to inform assessments of species status, distribution, and habitat needs.

Once a network of Focal Areas is determined, a critical need will be the prioritization of management activities to maximize the benefit for Focal Species, Priority Species, and their respective habitats. The results of this project emphasize the need for immediate and sustained habitat management for many of the Focal Species and Priority Species. Many of the species and natural communities evaluated for this project are experiencing a decline in their viability due to threats correlated with fragmentation and habitat degradation such as invasive species, fire suppression, and altered hydrology. In addition to management prioritization and execution, an additional future need will be the development of monitoring protocols for Focal and Priority Species and associated habitat to evaluate the success of management within these Focal Areas and inform adaptive management.

CONCLUSION

Through work on this three-pronged project, MNFI has contributed to the ongoing revision of the DNR's Wildlife Action Plan and the development of a network of Focal Areas in which to concentrate limited resources for management. The first component of this project was an evaluation of element occurrence Focal and Priority Species and intersecting high-quality natural communities. MNFI scientists updated a total of 1,002 species EOs and 690 natural community EOs.

The second stage of the project involved targeted species and natural community surveys that were conducted during the field season. Rare species surveys updated 16 EOs (8 secretive locust EOs, 2 blazing star borer moth EOs, 1 culver's root borer moth EO, 3 frosted elfin EOs, and 2 Karner blue EOs) and 4 new secretive locust EOs were documented. Natural community surveys updated 10 natural community EOs (4 northern fen EOs, 3 dry sand prairie EOs, 2 prairie fen EOs, and 1 oak-pine barrens EO) and two new natural community EOs were documented (1 northern fen EO and 1 oak-pine barrens EO).

The final component of the project involved identifying a preliminary network of potential Focal Areas through prioritized scoring, data interpretation, and GIS analysis. For each potential Focal Area, we have provided information summarizing what Core Design Team Recommendation Areas, natural community EOs, and rare animal species EOs occur within the area. The information provided in this report and developed through this project will help the WLD and its stakeholders finalize a network of Focal Areas to be incorporated into the revised Wildlife Action Plan.

Black tern

Six potential Focal Areas were identified for this species, two corresponding to Great Lakes marsh EOs, two corresponding to CDTRAs, and two new polygons were delineated centered around black tern EOs 13547 and 13539. A total of 50% of the EOs for this species was captured by the potential Focal Areas including 7 of 9 B ranked sites.

Black-crowned night heron

Five potential Focal Areas were identified for this species, one corresponding to a Great Lakes marsh EO, one corresponding to common moorhen EO 1121, two corresponding to CDTRAs, and one new polygon was delineated centered around black-crowned night heron EO 14015. A total of 40% of the EOs for this species was captured by the potential Focal Areas including all 4 of the C-ranked occurrences.

Blazing star borer

Eight potential Focal Areas were identified for this species, all corresponding to natural community EOs (4 prairie fens, 1 lakeplain wet prairie, 1 mesic sand prairie, 1 oak barrens, and 1 wet-mesic prairie). Fifty-three percent of this moth's EOs was captured by the potential Focal Areas including 13 out of the 20 A or B ranked occurrences.

Cerulean warbler

Six potential Focal Areas were identified for this species, all corresponding to natural community EOs (4 dry-mesic southern forests and 2 floodplain forests). A total of 31% of the known occurrences for Cerulean warbler in the state was captured by the potential Focal Areas including 9 of 13 A or B ranked occurrences.

Common loon

Six potential Focal Areas were identified for this species, all corresponding to CDTRAs. A total of 98 or 20% of the common loon occurrences was captured by the potential Focal Areas, with most of those being ranked as E (extant).

Common tern

Nine potential Focal Areas were identified for this species, seven corresponding to natural community EOs (4 Great Lakes marsh, 2 limestone cobble shore, and 1 sand and gravel beach), one corresponding to a CDTRA, and one new polygon was delineated centered around common tern EO 3827. A total of 19 or 22% of the common tern occurrences was captured by the potential Focal Areas including 5 C or higher ranked occurrences.

Dickcissel

Eight potential Focal Areas were identified for this species, all corresponding to new polygons that were delineated centered around existing dickcissel EOs, four of which occur in CDTRAs. For two of the Focal Areas, we recommended using large grasslands within the appropriate management unit (Deford State Game Area and Ionia State Recreation Area). A total of 22% of the known dickcissel occurrences in the state was captured by the potential Focal Areas including 2 of the 3 C ranked occurrences.

Dusted skipper

Eight potential Focal Areas were identified for this species, seven corresponding to natural community EOs (3 dry sand prairies, 3 pine barrens, and 1 wet-mesic sand prairie) and 1 new polygon that was delineated centered around existing dusted skipper EO 88 and mesic sand prairie EO 5005. A total of 10 or 18% of the EOs for this species was captured by the potential Focal Areas including 4 of the 15 A or B ranked occurrences in the state.

Eastern box turtle

Five potential Focal Areas were identified for this species, all corresponding to CDTRAs. A total of 75 or 26% of the EOs for this turtle was captured by the potential Focal Areas including 14 of 15 A or AB ranked occurrences.

Eastern fox snake

Six potential Focal Areas were identified for this species, three corresponding to natural community EOs (2 Great Lakes marshes and 1 lakeplain wet prairie), two corresponding to CDTRAs, and one new polygon that was delineated centered around eastern fox snake EO 11151. A total of 24 or 56% of the known EOs for this snake was captured by the potential Focal Areas including 13 of 20 B or C ranked occurrences.

Eastern massasauga

Fifteen potential Focal Areas were identified for this species, eight corresponding to natural community EOs (5 prairie fens, 2 floodplain forests, and 1 dry-mesic southern forest), three corresponding to CDTRAs, one corresponding to Bois Blanc Island, one corresponding to massasauga EO 15928, and two new polygons that were delineated centered around existing massasauga EOs 936 and 12835. A total of 69 or 25% of the EOs for the eastern massasauga was captured by the potential Focal Areas including 31 which are either A or B ranked.

Eastern pipistrelle

Five potential Focal Areas were identified for this species, one corresponding to a species EO that is a known hibernacula, four corresponding to CDTRAs, and one new polygon that was delineated centered around the Ontonagon River Valley CDTRA and eastern pipistrelle EO 19392. The potential Focal Areas captured a total of 6 or 50% of the known EOs for this species in the state.

Grasshopper sparrow

Twelve potential Focal Areas were identified for this species, all corresponding to new polygons that were delineated centered around existing grasshopper sparrow EOs, two of which occur in CDTRAs. For four of the Focal Areas, we recommended using large grasslands within the appropriate management unit (Deford State Game Area, Ionia State Recreation Area, Sharonville State Game Area, and Verona State Game Area). A total of 20 or 17% of the known EOs for this bird was captured by the potential Focal Areas of which 11 were C ranked or higher.

Henslow's sparrow

Seven potential Focal Areas were identified for this species, all corresponding to new polygons that were delineated centered around existing Henslow's sparrows EOs, one of which occurs in a CDTRA. For three of the Focal Areas, we recommended using large grasslands within the appropriate management unit (Ionia State Recreation Area, Sharonville State Game Area, and Verona State Game Area). The potential Focal Areas captured a total of 16 or 22% of the EOs for this species, including 4 of 9 highest ranked occurrences (C ranks).

Hine's emerald

Nine potential Focal Areas were identified for this species, all corresponding to natural community EOs (5 northern fens, 3 coastal fens, and 1 wooded dune and swale complex). A total of 15 or 100% of the EOs for this federally endangered dragonfly was captured by the potential Focal Areas.

Indiana bat

Six potential Focal Areas were identified for this species, five corresponding to CDTRAs and one new polygon that was delineated centered around the Sharonville-Raisin HW CDTRA. The potential Focal Areas captured 28% of the known EOs for this bat.

Karner blue

Nine potential Focal Areas were identified for this species, eight corresponding to natural community EOs (6 oak-pine barrens and 2 dry sand prairies) and 1 new polygon that was delineated centered around existing karner blue EO 5246 and mesic sand prairie EO 5005. A total of 32 or 17% of the EOs for this butterfly was captured by the potential Focal Areas including 13 A or B ranked occurrences.

Kirtland's warbler

Seven potential Focal Areas were identified for this species, all corresponding to natural community EOs (5 pine barrens, 1 dry sand prairie, and 1 oak-pine barrens). It is important to note that these areas are identified as Focal Areas for managing for Kirtland's warbler and the suite of dry pine plains species associated with it and not for single species management of just Kirtland's warbler through intensive clear-cutting and planting that currently characterizes the Kirtland's Warbler Management Units. A total of 10 or 23% of the EOs for this bird was captured by the potential Focal Areas including two B or C ranked occurrences.

Mitchell's satyr

Nine potential Focal Areas were identified for this species, five corresponding to prairie fen EOs and four corresponding to Mitchell's satyr EOs. A total of 50% of the known EOs for this federally endangered butterfly was captured by the potential Focal Areas including 6 occurrences ranked C or higher.

Northern bat

Fifteen potential Focal Areas were identified for this species, seven corresponding to known hibernacula (3 species EOs and 4 natural community EOs), and eight corresponding to CDTRAs. Seventeen of 67 or 25% of the known EOs for this bat was captured by the potential Focal Areas.

Piping plover

Ten potential Focal Areas were identified for this species, one corresponding to piping plover EO 1138, six corresponding to natural community EOs (3 open dunes, 1 Great Lakes barrens, 1 interdunal wetland, and 1 wooded dune and swale complex), and three new polygons that were delineated centered around common tern EO 3827, piping plover EO 1908, and piping plover EO 9148. The Focal Areas captured a total of 53% of the EOs for this bird including 12 that are C ranked or better.

Rusty patched bumble bee

MNFI has no records of this species in its database. No Focal Areas were identified for this species.

Secretive locust

Six potential Focal Areas were identified for this species, two corresponding to secretive locust EOs, one corresponding to a pine barrens EO, and three corresponding to CDTRAs. A total of 10 EOs or 15% was captured by the potential Focal Areas including 6 which are B ranked. Additional Focal Areas for this endemic species may need to delineated in the Northern Lower Peninsula, which is the only place in the world it occurs.

Tamarack tree cricket

Ten potential Focal Areas were identified for this species, all corresponding to natural community EOs (7 prairie fens, 2 bogs, and 1 rich tamarack swamp). A total of 25 or 47% of the known EOs for this tree cricket was captured by the potential Focal Areas, including 19 of which are B ranked or higher.

Yellow rail

Eight potential Focal Areas were identified for this species, three corresponding to Great Lakes marsh EOs, four corresponding to CDTRAs, and one new polygon that was delineated centered around yellow rail EO 2304 and the Potty Water Marsh. The potential Focal Areas captured 9 of 11 or 82% of the known EOs for this bird in the state.

Yellow-throated warbler

Four potential Focal Areas were identified for this species, one corresponding to a floodplain forest EO, two corresponding to CDTRAs, and one new polygon that was delineated centered around yellow-throated warbler EO 13333. These four potential Focal Areas capture five yellow-throated warbler EOs. The potential Focal Areas captured 5 of 9 or 56% of the known EOs for this warbler including 5 that are C ranked or higher.

APPENDIX 2

3-Striped Oncocnemis

This Priority Species is not captured by the proposed Focal Areas. There are only two documented occurrences of this species in the state and they are all historical records. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Angular spittlebug

This Priority Species is captured by prairie fen EOs 327, 1003, 1928, 12498, and 16864.

Aweme borer

This Priority Species is not captured by the proposed Focal Areas. We suggested adding aweme borer EO 11716, northern fen EO 18680, and poor fen EO 18679. There are only two documented occurrence of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Barn owl

This Priority Species is not captured by the proposed Focal Areas. The five records of this species are historical. Current survey effort is needed to get a better understanding of the status and distribution of this species in Michigan.

Barrens buckmoth

This Priority Species is not captured by the proposed Focal Areas. We suggest adding Sumpter Prairie Complex CDTRA and one new polygon that was delineated centered around barrens buckmoth EO 18585. This species is proposed to be removed from MNFI's list of Special Concern species.

Boreal chorus frog

One EO of boreal chorus frog occurs in Michigan. This species is captured by the Isle Royale CDTRA.

Catinella exile

This rare land snail is captured by northern fen 5040. In addition, we suggest including limestone bedrock lakeshore EOs 8109 and 10606. There are only three documented occurrences of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Catinella protracta

This rare land snail is not captured by the proposed Focal Areas. There are only six documented occurrence of this species in the state and they are all historical records. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Copperbelly water snake

This species is captured by the Three Rivers SGA CDTRA. We suggest also including the Clear Fork CDTRA to capture an additional population of this federally threatened species.

Common moorhen

This species is captured by Great Lakes marsh EOs 4018 and 11695 and the Tobico Lakeplain CDTRA.

Culver's root borer

This species is captured by dry sand prairie EO 7341, lakeplain wet-mesic prairie 515, and mesic sand prairie 10066. We also suggested including dry sand prairie EO 2576, wet-mesic sand prairie EO 11947, and the Petersburg Lake Plain CDTRA.

Doll's merolonche

This Priority Species is not captured by the proposed Focal Areas. There are sixteen documented occurrence of this species in the state and they are all historical records. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Dorydiella kansana

This Priority Species is captured by prairie fen EOs 327, 1928, and 2833. We suggest adding coastal fen EO 1936, lakeplain wet-mesic prairie EO 3795, and prairie fen EO 13555.

Dukes' skipper

This Priority Species is captured by the Liberty Fen CDTRA. We suggest adding Sumpter Prairie Complex CDTRA, Petersburg Lake Plain CDTRA, Sibley Prairie Complex CDTRA, and one new polygon that was delineated centered around barrens buckmoth EO 18585.

Dune cutworm

This Priority Species is captured by open dunes EO 10977 and the new polygon delineated centered around piping plover EO 9148 (Whitefish Point). We suggest adding open dunes EOs 1830 and 7936.

Ebony boghaunter

This Priority Species is captured by Sleeper Lake Peatlands CDTRA and the new polygon delineated centered around piping plover EO 9148 (Whitefish Point). We suggest adding alvar EO 2121, hardwood-conifer swamp EO 4911, and muskeg EO 10471. This species is proposed to be removed from MNFI's list of Special Concern species.

Extra-striped snaketail

This Priority Species is captured by the Porcupine Mountains CDTRA. This species is found in streams that pass through forested landscapes and probably should also be evaluated as an aquatic species. Current surveys are needed to evaluate the status, distribution, and habitat needs of this species in Michigan.

Forster's tern

This species is captured by Great Lakes marsh EOs 4018, 11695, and 3574, and the new polygon that was delineated centered around black tern EO 13539 (Wigwam Bay Impoundment).

Flexamia delongi

This Priority Species is captured by dry sand prairie EOs 232 and 7341. We suggest adding alvar EO 2121. This species is proposed to be removed from MNFI's list of Special Concern species.

Flexamia reflexa

This Priority Species is captured by lakeplain wet-mesic prairie EO 515 and lakeplain wet prairie EO 8228.

Flexamia huroni

This Priority Species is captured by northern fen EO 5040 and prairie fen EO 11614. We suggest adding prairie fen EOs 1556, 6916, 8730, and 12177. There are only six EOs for this species in the state.

Frosted elfin

This Priority Species is captured by dry sand prairie EO 232 and oak-pine barrens EOs 13435 and 15852.

Gastrocopta holzingeri

This rare land snail is not captured by the proposed Focal Areas. We suggest including the Garden Limestone Complex CDTRA. There are only four documented occurrences of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Gorgone checkerspot

This Priority Species is not captured by the proposed Focal Areas. There is only one documented occurrence of this species in the state and it is a historical record. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Great Plains spittlebug

This Priority Species is captured by dry sand prairie EOs 232, 2576, and 7341, and oak-pine barrens EO 15852. We suggest adding Great Plains spittlebug EO 18607.

Grizzled skipper

This Priority Species is not captured by the proposed Focal Areas. We suggest adding the Lake Augusta-Thompson's Harbor CDTRA.

Guppya sterkii

This rare land snail is not captured by the proposed Focal Areas. We suggest including the *Guppya sterkii* EO 2684. There is only one documented occurrence of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Hendersonia occulta

This rare land snail is not captured by the proposed Focal Areas. We suggest including *Hendersonia occulta* EOs 4751 and 11772. There are only two documented occurrences of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

King rail

This species is captured by Great Lakes marsh EOs 823 and 4018.

Kirtland's snake

This species is captured by floodplain forest EO 13369.

Long-eared owl

This Priority Species is not captured by the proposed Focal Areas. Current survey effort is needed to get a better understanding of the status and distribution of this species in Michigan.

Lynx

This Priority Species is captured by the East Lake CDTRA and Isle Royale CDTRA. There are only three EOs for lynx in Michigan.

Peregrine falcon

This species is captured by the Huron Mountains CDTRA, Pictured Rocks CDTRA, and Porcupine Mountains CDTRA. More surveys for this species are needed in its natural habitat.

Prairie vole

This Priority Species is captured by the Fort Custer CDTRA. This species is proposed to be removed from Michigan's list of threatened and endangered species.

Prairie warbler

This species is captured by open dunes EOs 126 and 8311.

Leadplant moth

This Priority Species is not captured by the proposed Focal Areas. We suggest adding the Sauk Trail Prairie CDTRA. There is only one documented occurrence of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Lake Huron locust

This Priority Species is captured by open dunes EO 126, wooded dune and swale complex EO 5042, and the new polygon delineated centered around piping plover EO 1908 (Wilderness State Park). We suggest adding open dunes EOs 1910, 4200, and 10790 and Lake Huron locust EO 6459.

Marbled salamander

Four historical EOs of marbled salamander occur in Michigan. This species is captured by the Allegan Core CDTRA. More survey effort is needed to get a better understanding of the status and distribution of this species in Michigan.

Migrant loggerhead shrike

This Priority Species is not captured by the proposed Focal Areas. All of the records of this species are historical. Current survey effort is needed to get a better understanding of the status and distribution of this species in Michigan.

Newman's brocade

This Priority Species is captured by Prairie Fen EO 12498. We suggest adding Sumpter Prairie Complex CDTRA. This species is proposed to be removed from MNFI's list of Special Concern species.

Northern blue

This Priority Species is captured by the Isle Royale CDTRA. We suggest adding the Creighton River Wetland Complex CDTRA and Craig Lake McCormick Tract Connector CDTRA. Current surveys are needed to evaluate the status of this species in Michigan.

Northern hairstreak

This Priority Species is captured by the new polygon delineated centered around eastern fox snake EO 11151. There are only two documented occurrences of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Ottoe skipper

This Priority Species is captured by oak-pine barrens EOs 9227 and 13435. We suggest adding ottoe skipper EO 1074. Current surveys are needed to evaluate the status of this species in Michigan.

Persius duskywing

This Priority Species is captured by oak-pine barrens EOs 9227. Current surveys are needed to evaluate the status of this species in Michigan.

Phlox moth

This Priority Species is not captured by the proposed Focal Areas. There are only three documented occurrences of this species in the state and they are all historical records. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Pinetree cricket

This Priority Species is captured by prairie fen EOs 327, 1928, 7579, 12498, and 13087. This species is proposed to be removed from MNFI's list of Special Concern species.

Pipevine swallowtail

This Priority Species is captured by Mud Creek Wetland CDTRA and Three Rivers CDTRA. This species is proposed to be removed from MNFI's list of Special Concern species.

Poweshiek skippering

This Priority Species is captured by prairie fen EOs 327, 1928, and 11614. We suggest adding prairie fen EOs 1556, 8730, 12177, and 15893. This species was recently listed as Federally Endangered and we also suggest moving this from a Priority Species to a Focal Species.

Red-legged spittlebug

This Priority Species is captured by dry sand prairie EO 232, lakeplain wet prairie EO 8228, and prairie fen EOs 1928 and 11614.

Regal fritillary

All EOs for this species are historical records and this species will likely be classified as state extirpated. Historical records for this species are captured by dry sand prairie EO 232 and the Fort Custer CDTRA.

Short-eared owl

This Priority Species is not captured by the proposed Focal Areas. Current survey effort is needed to get a better understanding of the status and distribution of this species in Michigan. This species would benefit from large grassland complexes and pheasant restoration areas.

Silphium borer moth

This Priority Species is captured by prairie fen EOs 1928 and 10243. We suggest adding lakeplain wet-mesic prairie EO 12663 and the Bakertown CDTRA. Current surveys are needed to evaluate the status of this species in Michigan.

Six-lined racerunner

This Priority Species is not captured by the proposed Focal Areas. MNFI has no records of this species in its database. More survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Smallmouth salamander

This Priority Species is not captured by the proposed Focal Areas. We suggest including the Down River Erie and Petersburg Lake Plain CDTRAs to capture this priority species.

Smokey shrew

This Priority Species is not captured by the proposed Focal Areas. We suggest including smokey shrew EO 9505 from Sugar Island. There is only one documented occurrence of this species in the state. This species will likely be removed as a Priority Species.

Spartina borer moth

This Priority Species is captured by dry sand prairie EO 7341 and prairie fen EO 12498. There are only six EOs for this species in the state and five of those are historical records. Current surveys are needed to evaluate the status of this species in Michigan.

Sprague's pygarctia

This Priority Species is captured by the Allegan Core CDTRA. All fourteen EOs for this species are historical records. Current surveys are needed to evaluate the status of this species in Michigan. This species will likely come off the MNFI Special Concern species list following surveys.

Swamp metalmark

This Priority Species is captured by prairie fen EOs 1003, 2833, and 1928, Three Rivers CDTRA, and River Raisin CDTRA. We suggest adding prairie fen EO 10364.

Three-staff underwing

This Priority Species is captured by the Barry Yankee Springs CDTRA. The sole EO for this species is a historical record. Current surveys are needed to evaluate the status, distribution, and habitat needs of this species in Michigan.

Vallonia gracilicosta albula

This rare land snail is captured by the East Lake CDTRA. In addition, we suggest including limestone cliff EO 5671 and limestone lakeshore cliff EO 3234. There are only eight documented occurrences of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Vertigo hubrichti

This rare land snail is not captured by the proposed Focal Areas. We suggest including limestone bedrock glade EO 9612, limestone bedrock lakeshore EOs 10606 and 11798, limestone cliff EO 5671, and limestone lakeshore cliff EO 3234. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Vertigo modesta modesta

This rare land snail is not captured by the proposed Focal Areas. We suggest including _Vertigo modesta modesta_ EOs 2333 and 7269. There are only two documented occurrences of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Vertigo modesta parietalis

This rare land snail is not captured by the proposed Focal Areas. We suggest including _Vertigo modesta parietalis_ EO 705. There is only one documented occurrence of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Vertigo nylanderi

This rare land snail is not captured by the proposed Focal Areas. We suggest including alvar EO 2121 and northern fen EO 16603. There are only eleven documented occurrences of this species in the state. Current survey effort is needed to get a better understanding of the status, distribution, and habitat needs of this species in Michigan.

Western meadowlark

This Priority Species is not captured by the proposed Focal Areas. Current survey effort is needed to get a better understanding of the status and distribution of this species in Michigan. This species would benefit from large grassland complexes and pheasant restoration areas.

Wild indigo duskywing

This Priority Species is captured by prairie fen EO 2833. However, this species is proposed to be removed from MNFI's list of Special Concern species.

Wilson's phalarope

This Priority Species is not captured by the proposed Focal Areas. Current survey effort is needed to get a better understanding of the status and distribution of this species in Michigan. This species is proposed to be removed from MNFI's list of Special Concern species.