

**White Pine Springs
Threatened and Endangered Aquatic Species Report.**

July 18, 2016

Prepared for:

Nestle Waters North America, Inc.

Prepared by:

ADVANCED ECOLOGICAL MANAGEMENT

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AeM

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Introduction

Nestle' Waters North America Inc. (NWNA) has commissioned aquatic studies for the White Pine Springs site within Osceola County in 2003, annually from 2006 through 2013, and once every other year since 2013 as part of a process of investigating and monitoring the aquatic system in the vicinity of the groundwater withdrawal well located approximately three miles northwest of the city of Ewart, Michigan (Figure 1-1; AEM 2008-2013; NES, 2003; KME, 2006; MPI, 2006). Advanced Ecological Management, LLC (AEM) has conducted the aquatic studies since 2006 and AEM personnel have participated in all aquatic surveys that were conducted prior to 2006 for this project.

Aquatic surveys have included assessments of fish community composition and relative abundance, aquatic macroinvertebrate community composition and relative abundance, and assessment of water quality and general habitat conditions. The aquatic surveys have been conducted repeatedly in five sample stations since 2003 and two additional locations were added to the monitoring network in 2015 (Figure 1-1).

As part of the aquatic surveys, AEM has also conducted surveys for the presence of State Threatened, Endangered, or Special Concern species (listed species) that may be found within the stream survey stations that have been monitored by NWNA. The purpose of this report is to summarize the findings regarding the presence of listed species from all the aquatic surveys conducted by AEM personnel for the White Pine Springs project.

Methods

A total of seven sample stations have been evaluated for the presence of listed species as part of repeated aquatic surveys. Four sample stations are located in Twin Creek (Stations SF1, SF5, SF5-6, and SF9) and three sample stations are located in Chippewa Creek (Stations SF8, SF8-1, and SF16), Osceola County, MI (Figure 1-1). All sample stations are 100 feet in length and are situated in locations where previous aquatic surveys have been conducted for the NWNA project, except for Stations SF8 and SF8-1 of Chippewa Creek, where the length of Station SF8 was approximately 400 feet and the length of Station SF8-1 was approximately 200 feet.

Aquatic surveys conducted by AEM included assessments of the presence of listed fish and aquatic macroinvertebrates. Fish were collected by wading using a backpack electroshocker. A single upstream

pass was conducted to evaluate fish community composition and relative abundance throughout each sample station. The duration of electroshocking was recorded and stunned fish were placed in a live-well for identification and enumeration. As part of the enumeration process, the species, length, weight, and number of fish captured were recorded. Fish were returned alive to the system following collection and identification. Fish were identified to species using various taxonomic references (Bailey et al., 2003; Coon, 2001; Becker, 1983).

Upon completion of fish sampling, aquatic macroinvertebrates, including mussels and decapods (crayfish), were collected within each station using D-framed kick nets (Merritt et al., 1996). Stations were sampled for 30 minutes using two kick nets (total sample time = 1 hour/station) and samples were collected in all habitat types within each station to characterize the macroinvertebrate community. Collected specimens were identified to the lowest possible taxonomic level using various taxonomic references (Bright, 2015; Merritt et al., 2008; Cummings and Mayer, 1992; Peckarsky et al., 1990; Pennak, 1990).

The Michigan Natural Feature Inventory (MNFI) County Element List for Osceola County was reviewed to determine if any threatened, endangered, or special concern aquatic species potentially existed within Osceola County. In addition, a county wide MNFI database search was conducted to determine if any of the listed species potentially occurred within Twin or Chippewa Creeks near the project vicinity.

Results and Discussion

The MNFI County Element Data indicates the potential presence of four species of mussels and one minnow species within Osceola County (Table 1). Two of the mussel species are listed as Special Concern, the slippershell (*Alasmidonta viridis*) is listed as Threatened, and the black sandshell (*Ligumia recta*) is listed as Endangered by the State of Michigan. The bigmouth shiner (*Notropis dorsalis*) is listed as Special Concern. Further review of the detailed MNFI database search indicates the historical location records for the mussels and the bigmouth shiner have been observed within the Muskegon River or other river systems in Osceola County that do not include Twin or Chippewa Creeks (Appendix A).

Table 1. List of threatened, endangered, and special concern aquatic species that are known to occur in Osceola County, Michigan. Source: Michigan Natural Features Osceola County Elemental Data

Common Name	Scientific Name	State Status	Federal Status
Bigmouth shiner	<i>Notropis dorsalis</i>	<i>Special concern</i>	<i>Not listed</i>
Black sandshell	<i>Ligumia recta</i>	<i>Endangered</i>	<i>Not listed</i>
Elktoe	<i>Alasmidonta marginata</i>	<i>Special concern</i>	<i>Not listed</i>
Round pigtoe	<i>Pleurobema sintoxia</i>	<i>Special concern</i>	<i>Not listed</i>
Slippershell	<i>Alasmidonta viridis</i>	<i>Threatened</i>	<i>Not listed</i>

Fish and macroinvertebrate community composition have generally remained consistent among all years surveyed by AEM. No listed fish or macroinvertebrate species, including freshwater mussels have been observed in Twin or Chippewa Creeks by AEM as part of the aquatic surveys that have been conducted for Nwana since 2003. Based on the MNFI data and the AEM aquatic surveys it is unlikely that the streams in the vicinity of the White Pine Springs well contain fish or mussels that are listed as threatened, endangered, or special concern.

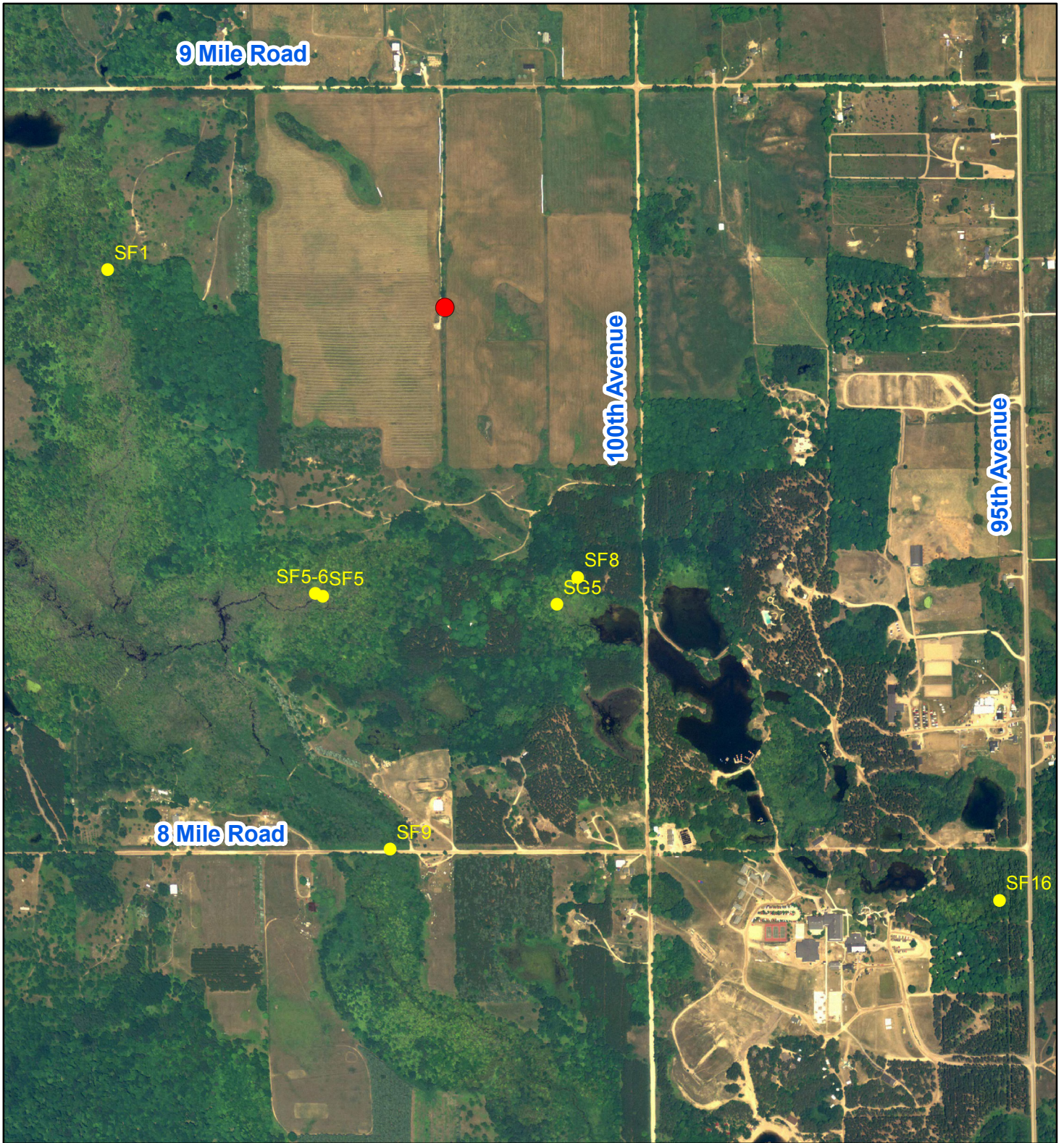
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- (MNFI) Michigan Natural Features Inventory. 2015. Osceola County Element Data. Michigan State University, East Lansing, MI.
- (NES) Northern Ecological Services. 2003. Twin and Chippewa Creeks Aquatic Community Evaluation.

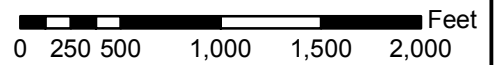
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Pennak, R. W. 1990. Freshwater invertebrates of the United States: protozoa to mollusca. 4th ed. John Wiley and Sons, Inc. 656 pp.

Figures



Base map and aerial imagery obtained from Michigan Geographic Data Library



Legend

- Sample Station Locations
- Approximate Location of Well



PROJECT

NWNA White Pine Springs

TITLE

Sample Station Locations

FIGURE

1-1

Appendix A



Michigan Natural Features Inventory

Web Database Search

Search Results for Osceola County

Displaying Record 1 to 25 of 71 Records Found

Query Results Generated on Mar 28, 2016

Database Updated on Dec 14, 2015

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Common Name	Scientific Name	State Status	Federal Status	First Observed Year	Last Observed Date	Element Category	Mapping Precision	Site of Observation	Management Comments	Protection Comments	Best Documentation of EO	Element Occurrence Code	Town	Range	Section	County
	Poor Conifer Swamp			1987-05-02	1988-06-28	Community		Hobart Swamp		Maintain hydrology, prevent run-off from ag fields and highway.	Reese, G.A. and W. Brodowicz. 1988. June 28 - MNFI Site Survey.	CEMI0052*021*MI	20N	10W	1	Osceola
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2000?	2005-05-25	Animal		OI-01 Evert			Best, D. 2005. Aug 29 - BAEA Survey Results, Lower Peninsula - 2005, USFWS data.	ABNKC10010*698*MI	17N	07W	19	Osceola
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2000?	2005-05-25	Animal		OI-01 Evert			Best, D. 2005. Aug 29 - BAEA Survey Results, Lower Peninsula - 2005, USFWS data.	ABNKC10010*698*MI	17N	08W	13,24	Osceola
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2003	2005-05-25	Animal		OI-03 Eggle Lake			Best, D. 2005. Aug 29 - BAEA Survey Results, Lower Peninsula - 2005, USFWS data.	ABNKC10010*699*MI	20N	09W	4,5,8,9	Osceola
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2012	2012	Animal		OI-06			Email from Matt Stuber to D. Cuthrell. 10-16-2012. Included were locations of bald eagle nest sites in attached shapefiles.	ABNKC10010*961*MI	19N	08W	8,9	Osceola
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC		2012	2012	Animal		OI-05			Email from Matt Stuber to D. Cuthrell. 10-16-2012. Included were locations	ABNKC10010*962*MI	19N	07W	29	Osceola

Bald eagle	<i>Haliaeetus leucocephalus</i>	SC	2012	2012	Animal	OI-04		of bald eagle nest sites in attached shapefiles. Email from Matt Stuber to D. Cuthrell. 10-16-2012. Included were locations of bald eagle nest sites in attached shapefiles.	ABNKC10010*963*MI	18N	07W	30	Osceola
Bigmouth shiner	<i>Notropis dorsalis</i>	SC	1996-07-24	1996-07-24	Animal	Middle Branch River		Bailey, R.M., W.C. Latta, and G.R. Smith. 2003. MI Fish Atlas 2003 - Access database and shapefiles. In Digital Water Atlas V1 edited by Institute for Fisheries Research, MI DNR, Feb 20 2003.	AFCJB28410*064*MI	20N	07W	28,33	Osceola
Bigmouth shiner	<i>Notropis dorsalis</i>	SC	1951	1996-07-24	Animal	Muskegon River		Bailey, R.M., W.C. Latta, and G.R. Smith. 2003. MI Fish Atlas 2003 - Access database and shapefiles. In Digital Water Atlas V1 edited by Institute for Fisheries Research, MI DNR, Feb 20 2003.	AFCJB28410*065*MI	18N	07W	15,16	Osceola
Black sandshell	<i>Ligumia recta</i>	E	1934-08-08	1934-08-08	Animal	Muskegon River		Unknown; 1934-08-08; UMMZ #60543	IMBIV26020*034*MI	17N	09W	19	Osceola
Black sandshell	<i>Ligumia recta</i>	E	1934-08-08	1934-08-08	Animal	Muskegon River		van der Schalie, Henry; 1934-08-08, UMMZ #60522	IMBIV26020*035*MI	18N	08W	27,34	Osceola
Black sandshell	<i>Ligumia recta</i>	E	1934-08-07	1949-08-29	Animal	Muskegon River		van der Schalie, Henry; 1949-08-29; UMMZ #170011	IMBIV26020*038*MI	18N	07W	1,15,16,21	Osceola
Blanding's turtle	<i>Emydoidea blandingii</i>	SC	1995	1995-06	Animal	S Johnson Creek			ARAAD04010*041*MI	17N	10W	18	Osceola

Blanding's turtle	Emydoidea blandingii	SC	2002-05-22	2002-05-22	Animal		Us-131 East		Monfils, M. 2002. May 22 - MNFI Special Animal Survey Form and Map.	ARAAD04010*148*MI	20N	10W	13	Osceola
Blanding's turtle	Emydoidea blandingii	SC	2003-06-11	2003-06-11	Animal		Indian Lake		Legge, J. 2003. September 5 - Email to Yuman Lee of Brian Johnson data.	ARAAD04010*188*MI	18N	09W	9,16	Osceola
Common loon	Gavia immer	T	1969	1991-07-15	Animal	M	Rat-Tail Lake - Osceola County	Loss of nesting sites d/t high water levels. Continue to monitor and take adequate measures to protect the birds, especially during nesting season.		ABNBA01030*178*MI	17N	07W	31	Osceola
Common loon	Gavia immer	T	1969	1991-07-15	Animal	M	Rat-Tail Lake - Osceola County	Loss of nesting sites d/t high water levels. Continue to monitor and take adequate measures to protect the birds, especially during nesting season.		ABNBA01030*178*MI	17N	08W	36	Osceola
Common loon	Gavia immer	T	1968	1988	Animal	M	Saddlebag Lake - Osceola County		Dulin, G. 1986. The Loon Registry Program 1986 Report. Unpublished Report to TNC Field Office and MDNR Nongame Program.	ABNBA01030*179*MI	17N	08W	20,21	Osceola
Common loon	Gavia immer	T	1968	1994-07	Animal	M	Tiff Lake - Osceola County		Dulin, G. 1986. The Loon Registry Program 1986 Report. Unpublished	ABNBA01030*180*MI	17N	08W	16,17	Osceola

Report to TNC
Field Office and
MDNR
Nongame
Program.

Common loon	Gavia immer	T	1988	1992	Animal	M	Robinson Lake - Osceola County	Westhoven, Arlene. 1992 Michigan Loon Watch Report.	ABNBA01030*438*MI	18N	09W	6,7	Osceola
Common loon	Gavia immer	T	1987	2011	Animal	M	Strawberry Lake - Osceola County	Michigan Loon Preservation Association. 1992. Michigan Loon Watch Report.	ABNBA01030*445*MI	18N	09W	13,14	Osceola
Common loon	Gavia immer	T	1989	2002	Animal	M	Rose Lake - Osceola County; Sunrise Lake - Osceola County	Michigan Loon Preservation Association. 1992. Michigan Loon Watch Report.	ABNBA01030*470*MI	19N	08W	18,19	Osceola
Common loon	Gavia immer	T	1989	2002	Animal	M	Rose Lake - Osceola County; Sunrise Lake - Osceola County	Michigan Loon Preservation Association. 1992. Michigan Loon Watch Report.	ABNBA01030*470*MI	19N	09W	13,24	Osceola
Common loon	Gavia immer	T	1999	2002	Animal		Rose Lake - Osceola County	Michigan Loon Preservation Association. 1997-2001. Michigan Loon Watch Report and map.	ABNBA01030*791*MI	19N	09W	3,4,9,10	Osceola
Common loon	Gavia immer	T	2003	2003	Animal		Big Lake - Osceola County	Michigan Loon Preservation Association. 2003. Michigan Loon Watch Report and map.	ABNBA01030*833*MI	17N	07W	7,18	Osceola

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Common Name	Scientific Name	State Status	Federal Status	First Observed Year	Last Observed Date	Element Category	Mapping Precision	Site of Observation	Management Comments	Protection Comments	Best Documentation of EO	Element Occurrence Code	Town Range	Section	County
Common loon	<i>Gavia immer</i>	T		2003	2003	Animal		Big Lake - Osceola County			Michigan Loon Preservation Association. 2003. Michigan Loon Watch Report and map.	ABNBA01030*833*MI	17N 08W	13	Osceola
Common loon	<i>Gavia immer</i>	T		2006	2009	Animal		Indian Lake - Osceola County			Michigan Loon Preservation Association. 2002-2006. Loon Report sent by Joann Williams.	ABNBA01030*868*MI	18N 09W	9	Osceola
Common loon	<i>Gavia immer</i>	T		2003	2011	Animal		Center Lake - Osceola County			Michigan Loon Preservation Association. 2010-2012 Loon report and maps sent by Joanne Williams.	ABNBA01030*884*MI	20N 09W	21,22	Osceola
Dickcissel	<i>Spiza americana</i>	SC		2006-07-01	2012-06-16	Animal		Prairie Chicken Mgt. Area			Gibson, Julie. 2006. Summer. Compilation of grassland bird survey information (Excel table); surveys conducted by Julie Gibson and others.	ABPBX65010*012*MI	20N 07W	3,10	Osceola
Dickcissel	<i>Spiza americana</i>	SC		2006-07-01	2012-06-16	Animal		Prairie Chicken Mgt. Area			Gibson, Julie. 2006. Summer. Compilation of grassland bird survey information (Excel table); surveys conducted by Julie Gibson and others.	ABPBX65010*012*MI	20N 07W	3,10	Osceola
Elktoe	<i>Alasmidonta marginata</i>	SC		2002-06-12	2002-06-12	Animal		Muskegon River Mussels #7			Carman, S. 2002. June 12 - MNFI Aquatics	IMBIV02040*046*MI	19N 07W	14	Osceola

Species	Genus	State	County	Start Date	End Date	Category	Location	Survey Form	Coordinates	Count	Notes
Elktoe	Alasmidonta marginata	SC		2002-09-12	2002-09-12	Animal	Muskegon River Mussels #60	Special Animal Survey Form Carman, S. 2002. Sept 12 - Aquatics Special Animal Survey Form	IMBIV02040*048*MI 17N 08W	3	Osceola
Elktoe	Alasmidonta marginata	SC		1934-08-08	1934-08-08	Animal	Van Der Schalie'S Muskegon #14	van der Schalie, H. 1941. Zoogeography of Naiads in the Grand and Muskegon Rivers of Michigan as Related to Glacial History. Papers of the Michigan Academy of Science, Arts and Letters. 26:297-310.	IMBIV02040*050*MI 17N 09W	19,20,30	Osceola
Grasshopper sparrow	Ammodramus savannarum	SC	PS	2002-06-08	2002-06-08	Animal	19 Mile Road South		ABPBXA0020*010*MI 20N 10W	36	Osceola
Grasshopper sparrow	Ammodramus savannarum	SC	PS	2007-05-31	2007-05-31	Animal	Lakola Road	Stout, Bonnie. 2007. May 31 - Email describing bird occurrences in Lake County.	ABPBXA0020*085*MI 18N 10W	30,31	Osceola
Great Blue Heron Rookery	Great Blue Heron Rookery				1978	S		Janson, V. 1978. Bird Sightings in Book of County Maps. MDNR - Wildlife Division.	OWADINGCA1*038*MI 18N 07W	1	Osceola
Great Blue Heron Rookery	Great Blue Heron Rookery			1981	2007-04-11	S		Gibson, July. 2007. April 11 - Map of active GB Heron Rookery.	OWADINGCA1*136*MI 17N 10W	32	Osceola
Great Blue Heron Rookery	Great Blue Heron Rookery			1989	1989-04-14	S	Hersey Sw	Ennis, R. 1989. April 4 phone call to Leni Wilsman.	OWADINGCA1*262*MI 17N 10W	34	Osceola
Great Blue Heron Rookery	Great Blue Heron Rookery			2009-08-02	2009-08-02		Clareola Avenue	Penskar, Mike and Maureen Martin. 2009. August 2 - MNFI Special Species Form, Map, and Photos.	OWADINGCA1*313*MI 17N 07W	12	Osceola
Great Blue Heron Rookery	Great Blue Heron Rookery			1998-05-05	1998-05-05		West Branch River	Schonert, Loretta. 1998. A written letter with a nice description of the rookery with a hand drawn map.	OWADINGCA1*321*MI 19N 07W	16	Osceola

Henslow's sparrow	<i>Ammodramus henslowii</i>	E	2007-07-04	2007-07-04	Animal		7 Mile Road - Osceola County	Putnam, Caleb. 2007. July 6 - Email describing HESP occurrences from July 4 2007.	ABPBXA0030*077*MI	18N	07W	27,28,29,32	Osceola	
Henslow's sparrow	<i>Ammodramus henslowii</i>	E	2014-06-12	2014-06-12	Animal		Osceola-Missaukee Grasslands Sga	ATV disturbance, rutting. Ditches. Illegal mowing, succession, invasives	Victory, Erin and Keith Kintigh. 2012-06-16. MNFI Special Species Form - Henslow's Sparrow.	ABPBXA0030*087*MI	20N	07W	3	Osceola
Little brown bat	<i>Myotis lucifugus</i>	SC	1986-06-30	1986-07-02			West Branch Clam River	UMMZ online catalog for all collections of the species <i>Myotis lucifugus</i> , downloaded from VertNet (www.vertnet.org) 2015-06-17 for the State of Michigan. Saved in Excel spreadsheet. Also point and polygon shapefiles created from the database catalogue.	AMACC01010*017*MI	20N	07W	1,12,13	Osceola	
Migrant loggerhead shrike	<i>Lanius ludovicianus migrans</i>	E	1981	1981-06	Animal	M	Meyering-Forward Roads		ABPBR01037*001*MI	20N	07W	1,2	Osceola	
Osprey	<i>Pandion haliaetus</i>	SC		1995-07-10	Animal	S	Doc And Tom Creek		Postupalsky, S. Undated. Unpublished Osprey Report.	ABNKC01010*120*MI	18N	07W	24	Osceola
Osprey	<i>Pandion haliaetus</i>	SC		1989	Animal	S	Sherlock Creek		Postupalsky, S. Undated. Unpublished Osprey Reports.	ABNKC01010*173*MI	17N	07W	26,27	Osceola
Round pigtoe	<i>Pleurobema sintoxia</i>	SC	2002-06-12	2002-06-12	Animal		Muskegon River Mussels #7		Carman, S. 2002. June 12 - MNFI Aquatics Special Animal Survey Form	IMBIV35070*038*MI	19N	07W	14	Osceola
Round pigtoe	<i>Pleurobema sintoxia</i>	SC	1934-08-08	1934-08-08	Animal		Van Der Schalie'S Muskegon #14		van der Schalie, H. 1941. Zoogeography of Naiads in the Grand and Muskegon Rivers of Michigan as Related to Glacial History.	IMBIV35070*041*MI	17N	09W	19,20,30	Osceola

Short-eared owl	Asio flammeus	E	1992	1992-06-26	Animal	M	Prairie Chicken Management Area	Papers of the Michigan Academy of Science, Arts and Letters. 26:297-310. Grandlund, D. 1992. June 26 - Personal Communication to Tom Weise.	ABNSB13040*002*MI	20N	07W	2,3,4,9,10,11	Osceola
Slippershell	Alasmidonta viridis	T	2002-06-12	2002-06-12	Animal		Muskegon River Mussels #7	Carman, S. 2002. June 12 - MNFI Aquatics Special Animal Survey Form	IMBIV02110*019*MI	19N	07W	14	Osceola

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Common Name	Scientific Name	State Status	Federal Status	First Observed Year	Last Observed Date	Element Category	Mapping Precision	Site of Observation	Management Comments	Protection Comments	Best Documentation of EO	Element Occurrence Code	Town	Range	Section	County
Slippershell	<i>Alasmidonta viridis</i>	T		2002-06-12	2002-06-12	Animal		Muskegon River Mussels #17			Carman, S. 2002. June 12 - MNFI Aquatics Special Animal Survey Form	IMBIV02110*020*MI	19N	07W	15	Osceola
Slippershell	<i>Alasmidonta viridis</i>	T		2002-06-19	2002-06-19	Animal		Muskegon River Mussels #18				IMBIV02110*021*MI	20N	07W	12	Osceola
Slippershell	<i>Alasmidonta viridis</i>	T		1934-08-07	1934-08-07	Animal		Van Der Schalie'S Muskegon #11			van der Schalie, H. 1941. Zoogeography of Naiads in the Grand and Muskegon Rivers of Michigan as Related to Glacial History. Papers of the Michigan Academy of Science, Arts and Letters. 26:297-310.	IMBIV02110*024*MI	20N	07W	33,34	Osceola
Slippershell	<i>Alasmidonta viridis</i>	T		1934-08-08	1934-08-08	Animal		Van Der Schalie'S Muskegon #13			van der Schalie, H. 1941. Zoogeography of Naiads in the Grand and Muskegon Rivers of Michigan as Related to Glacial History. Papers of the Michigan Academy of Science, Arts and Letters. 26:297-310.	IMBIV02110*029*MI	18N	08W	26,27,34	Osceola
Slippershell	<i>Alasmidonta viridis</i>	T		1949-09-02	1949-09-02	Animal		Muskegon River, Middle Branch			Carman, S.M. 2002. Muskegon River Historical Mussel Search Results from the Univeristy of Michigan Museum of Zoology	IMBIV02110*031*MI	18N	07W	1	Osceola
Slippershell	<i>Alasmidonta viridis</i>	T		1934-08-07	1934-08-07	Animal		Van Der Schalie'S Muskegon Site #12			van der Schalie, H. 1941. Zoogeography of Naiads in the	IMBIV02110*040*MI	18N	07W	15,16	Osceola

Slippershell	Alasmidonta viridis	T	1934-08-08	1934-08-08	Animal		Muskegon River		Grand and Muskegon Rivers of Michigan as Related to Glacial History. Papers of the Michigan Academy of Science, Arts and Letters. 26:297-310.	van der Schalie, Henry; 1934-08-08; UMMZ #60536	IMBIV02110*209*MI	17N	09W							19	Osceola	
Slippershell	Alasmidonta viridis	T	1949-09-02	1949-09-02	Animal		Middle Branch River		Harry & van der Schalie; 1949-09-02; UMMZ #171443	IMBIV02110*292*MI	19N	07W									26	Osceola
Vasey's rush	Juncus vaseyi	T	2014-07-01	2014-07-01	Plant		20Th Ave. W	Periodic use of prescribed fire is suggested.	Slaughter, B. #1207, MICH.	PMJUN01340*019*MI	20N	07W									3	Osceola
Wood turtle	Glyptemys insculpta	SC	1978	1978	Animal	S	Branch River		Scharf, W. Personal Communication to Judy Soule, MNFI.	ARAAD02020*010*MI	19N	07W									26	Osceola
Wood turtle	Glyptemys insculpta	SC	1956	1969	Animal	GX	Cat Creek	survey needed	Tinkle, D. A. et.al. 1979 Occurrence records for endang. and threat. reptiles and amphib.'s in Mich.	ARAAD02020*062*MI	17N	08W								5,6,7,8,17,18,19,20,30		Osceola
Wood turtle	Glyptemys insculpta	SC	1956	1969	Animal	GX	Cat Creek	survey needed	Tinkle, D. A. et.al. 1979 Occurrence records for endang. and threat. reptiles and amphib.'s in Mich.	ARAAD02020*062*MI	17N	09W								1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36		Osceola
Wood turtle	Glyptemys insculpta	SC	1956	1969	Animal	GX	Cat Creek	survey needed	Tinkle, D. A. et.al. 1979 Occurrence records for endang. and threat. reptiles and amphib.'s in Mich.	ARAAD02020*062*MI	17N	10W								1,2,3,10,11,12,13,14,23,24,25		Osceola
Wood turtle	Glyptemys insculpta	SC	1956	1969	Animal	GX	Cat Creek	survey needed	Tinkle, D. A. et.al. 1979 Occurrence records for endang. and threat. reptiles and amphib.'s in Mich.	ARAAD02020*062*MI	18N	08W								18,19,20,29,30,31,32		Osceola
Wood turtle	Glyptemys insculpta	SC	1956	1969	Animal	GX	Cat Creek	survey needed	Tinkle, D. A. et.al. 1979 Occurrence records for endang. and threat. reptiles	ARAAD02020*062*MI	18N	09W								8,9,10,11,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36		Osceola

Species	Common Name	State	Year	Month	Category	Code	Location	Status	Notes	Coordinates	Page Numbers	County
Wood turtle	Glyptemys insculpta	SC	1956	1969	Animal	GX	Cat Creek	survey needed	Tinkle, D. A. et.al. 1979 Occurrence records for endang. and threat. reptiles and amphib.'s in Mich.	ARAAD02020*062*MI 18N 10W	13,23,24,25,26,34,35,36	Osceola
Wood turtle	Glyptemys insculpta	SC	1932	1932-07-17	Animal	M	Twin Creek	survey needed	UMMZ collection	ARAAD02020*063*MI 17N 08W	3,4,5	Osceola
Wood turtle	Glyptemys insculpta	SC	1932	1932-07-17	Animal	M	Twin Creek	survey needed	UMMZ collection	ARAAD02020*063*MI 18N 08W	20,21,27,28,29,32,33,34	Osceola
Wood turtle	Glyptemys insculpta	SC	1977	1977-05	Animal	S	Whetstone Creek	Survey needed.	Tinkle, D.A. Occurrence Record Note Card From State Survey for Endangered and Threatened Reptiles and Amphibians in Michigan.	ARAAD02020*066*MI 18N 07W	10	Osceola
Wood turtle	Glyptemys insculpta	SC	1969	1969-06-27	Animal	S	Coe Creek		Whipple, C. 1969. Unpublished memo.	ARAAD02020*103*MI 20N 10W	19,30	Osceola
Wood turtle	Glyptemys insculpta	SC	1995	1995-05	Animal	S	Johnson Creek	Maintain open field.	Kelly, J. 1995. May - MNFI Special Animal Form and Map.	ARAAD02020*113*MI 17N 10W	7,18	Osceola