



# Orchard Lake Nature Sanctuary Herpetofauna Inventory Report

September 2014



Prepared for  
The Orchard Lake Nature Sanctuary Advisory Board

Prepared by  
Herpetological Resource and Management, LLC  
P.O. Box 110  
Chelsea, MI 48118

*Suggested Citation:* Mifsud, David A. Orchard Lake Nature Sanctuary Herpetofauna Inventory Report. Herpetological Resource and Management Report 2014.

## Table of Contents

Introduction.....	2
Site Location and Description.....	2
Methods.....	2
Results.....	3
Discussion .....	3
Species Abstracts .....	5
Conclusion .....	5
Tables.....	6
Maps.....	7
Photos.....	8
References.....	20

## **Introduction**

Amphibians and reptiles are recognized as key bioindicators (gauges of environmental health), due in part to their high sensitivity to environmental pollutants and habitat disturbance. Consequently, assessment of herpetofauna abundance and species richness within an area can reveal much about the health of the ecosystem and can point to habitat quality concerns that may not be detected by water quality or floristic assessments (Cooperrider, Boyd et al. 1986; Welsh and Droege 2001; Micacchion 2004; Guilfoyle 2010). Overall amphibian and reptile presence, represented age classes, spatial distribution, and relative abundance can be important tools in identifying the need for and success of habitat restoration projects.

In 2014 Herpetological Resource and Managements, LLC (HRM) was contracted by the Village of Orchard Lake and the Orchard Lake Nature Sanctuary Board to conduct amphibian and reptile surveys within the Orchard Lake Nature Sanctuary. HRM previously conducted a herpetological assessment of the sanctuary in summer of 2000 and spring of 2001(Mifsud 2001). In conjunction with data collected during previous surveys, this study builds on a baseline assessment of herpetofauna richness within the site. The findings of these assessments will provide qualitative and quantitative data that can be used to assist in management and restoration planning to improve overall habitat quality and function.

## **Site Location and Description**

The Orchard Lake Nature Sanctuary is located in Orchard Lake Village in Oakland County, Michigan. The property is just east of the West Bloomfield Woods Nature Preserve and is approximately 50 acres in size. The sanctuary is surrounded by residential properties and frequently used by the public. Several walking trails are located throughout the site. High traffic roads border the property including one that divides the preserve from Orchard Lake. Various habitat types are supported at this site including multiple wetlands, old field, and forested upland.

## **Methods**

Herpetofauna surveys were conducted on May 17, June 10, and August 12, 2014 by teams of three to four biologists trained in the sampling and identification of amphibians and reptiles. HRM crews performed meandering transects through the property surveying in both aquatic and terrestrial habitats. These areas were searched for all life stages of herpetofauna and evaluated for potential habitat. Additional survey techniques including visual observation, aural identification of species calling, identification of potential nesting and basking spots, turning over cover materials, baited traps, and dip-netting were incorporated to optimize detection success and better depict species richness and spatial distribution. No voucher samples were collected, but photographs were taken when

possible. All survey activities were in accordance with HRM's Scientific Collector's and Threatened and Endangered Species permits issued by the State of Michigan.

Each positively identified amphibian and reptile was recorded in the database. The following data were collected for each record: (1) species, (2) gender of each individual (when possible), (3) behavior of each individual, and (4) reproductive condition of each individual (if it can be determined). Observation locations were recorded using a Juno SB GPS Unit, which records the location to U.S. Environmental Protection Agency (EPA) Tier II National Geospatial Data Spatial Standards, and mapped using ArcMap 9.3.1®.

## Results

Although overall weather conditions were cooler than typical for spring and summer in Michigan, conditions at the time of HRM's assessments were suitable for conducting herpetofauna surveys and multiple species of amphibians and reptiles were documented.

A total of fifteen species of herpetofauna were recorded during HRM's surveys (Table 1). Amphibians observed included Blue-spotted Salamander (*Ambystoma laterale*), Bullfrog (*Rana catesbeiana*), Eastern American Toad (*Bufo americanus americanus*), Gray Treefrog (*Hyla chrysoscelis/Hyla versicolor*), Green Frog (*Rana clamitans melanota*), Northern Spring Peeper (*Pseudacris crucifer crucifer*), Red-backed Salamander (*Plethodon cinereus*), Spotted Salamander (*Ambystoma maculatum*), Unisexual Salamander (*Ambystoma hybrid*), and Wood Frog (*Rana sylvatica*). Reptile species recorded include Butler's Garter Snake (*Thamnophis butleri*), Eastern Garter Snake (*Thamnophis sirtalis sirtalis*), Eastern Snapping Turtle (*Caretta caretta*), Midland Painted Turtle (*Chrysemys picta marginata*), and Red-eared Slider (*Trachemys scripta elegans*).

## Discussion

Of the amphibian and reptile species observed in 2014, several were not recorded during previous HRM surveys including Bullfrog, Spotted Salamander, Butler's Garter Snake, Eastern Snapping Turtle, and Red-eared Slider. Cool and wet weather conditions present during spring 2014, which resulted in elevated water levels during initial surveys, may have affected species detection in some aquatic habitats. Harsh winter conditions and atypical spring weather may have been a factor in the mortality of multiple turtles recorded from one wetland.

Although located in a heavily developed area, Orchard Lake Nature Sanctuary supports high quality habitat and HRM documented a wide assemblage of herpetofauna. In addition to more generalist species that are able to tolerate disturbed conditions such as Green Frog, Bullfrog, and Eastern Garter Snake, numerous amphibians and reptiles that are generally intolerant of disturbances or those with specific habitat requirements such as Spotted Salamander, Wood Frog, and Butler's Garter Snake were also observed. These results indicate that the sanctuary supports healthy populations of amphibians and reptiles and also has the potential to support additional species not observed during 2014 surveys (Table 1). There are several opportunities for habitat restoration throughout the sanctuary

that would not only improve overall site conditions, but also increase habitat for wildlife. Additional measures should be taken to preserve and protect high quality habitat already present.

When assessing restoration opportunities for amphibians and reptiles, a number of different factors should be considered (i.e., breeding/nesting sites, hibernacula, woody debris, etc.). Within the Orchard Lake Nature Sanctuary, areas suitable for turtle nesting are extremely limited. Creating open sandy spaces free of vegetation would benefit turtle populations by likely increasing rates of recruitment and reducing road mortalities of females in search of nesting sites.

An important measure that should be taken to preserve habitat quality in the sanctuary is the protection of the vernal pools present. These specialized habitats provide breeding locations for several sensitive amphibian species that take advantage of the low rate of disturbance and predatory fish-free conditions. High diversity of amphibian and macroinvertebrate species often found in these pools also attracts numerous other wildlife species in search of prey items. Furthermore, these wetlands act as a linkage between surrounding upland habitats where young and mature frogs and salamanders typically migrate following the breeding season (Calhoun and Demaynadier 2004). A majority of amphibian and reptile observations were recorded from within a wetland or in the nearby upland area. Maintaining these wetlands and the mosaic of habitat types they form is valuable in ensuring healthy populations of herpetofauna.

Since the last site visit by HRM in spring 2001, habitat conditions have noticeably changed throughout the site with denser vegetation in some areas and an increase in the number of invasive species throughout the sanctuary. Despite an increase in both the density and diversity of invasive species, the site still supports multiple community types as observed in previous monitoring. A noticeable absence of amphibians and reptiles was noted within the forested patch dominated by Norway maple (*Acer platanoides*). Consider a phased approach for removal of this non-native tree with replacement of more desirable native trees, which would likely result in an increased use of the area by amphibian and reptile species. Preserving the mosaic of habitats currently present at this site is important and efforts should be made to control invasive vegetation in order to maintain its ecological integrity.

Future restoration or general management activities should consider using appropriate best management practices to minimize any potential negative effects on amphibians and reptiles. Local impacts to herpetofauna can be lessened through various practices such as proper timing of herbicide application and mowing, management of invasive species, and restoration of critical habitat features. For detailed information on protecting amphibians and reptiles and contributing to their conservation refer to the Michigan Amphibian and Reptile Best Management Practices manual (Mifsud 2014).

## Species Abstracts

### *Spotted Salamander*

This species of salamander can be identified by its stout body with a broad head and two irregular rows of yellow spots running from the back of the head into the tail (Harding 1997). The Spotted Salamander is designated as a Species of Greatest Conservation Need (SGCN) in the Wildlife Action Plan (WAP) (Clark-Eagle, Hay-Chmielewski et al. 2005) and prefer habitat containing moist closed-canopy deciduous or mixed woodlands. This species relies on the presence of vernal pools to successfully mate and reproduce and are known to return the same breeding pond each year. More cryptic than some other species, Spotted Salamanders are not often seen after spring breeding season and spend much of their time in burrows underground or sometimes under or within rotting logs and leaf litter (Harding 1997). One of the largest threats facing this species is the loss of critical vernal pool habitat, which is often loss as a result of human activities such as logging.

### *Butler's Garter Snake*

This species has a limited range centered on southeast Michigan. Although similar in appearance to other Garter Snakes, the Butler's Garter Snake can be distinguished by its relatively small head that is barely wider than its neck, and by the positioning of its side stripes (Harding 1997). This species prefers wet open grassy areas, but can also be found in vacant lots and even in riprap. Butler's Garter Snakes feed primarily on earthworms, although slugs and snails are also consumed. They are somewhat more tolerant of colder temperatures and have a longer active period, starting in late March to early April and continuing through October or November (Harding 1997). Mating usually occurs after emerging from overwintering sites and young snakes are born live in mid to late summer. Although these snakes can be locally common, the species is undergoing a population decline in Michigan and other parts of its range, primarily due to loss of habitat. Butler's Garter Snake is listed as a federally Threatened Species in Canada.

## Conclusion

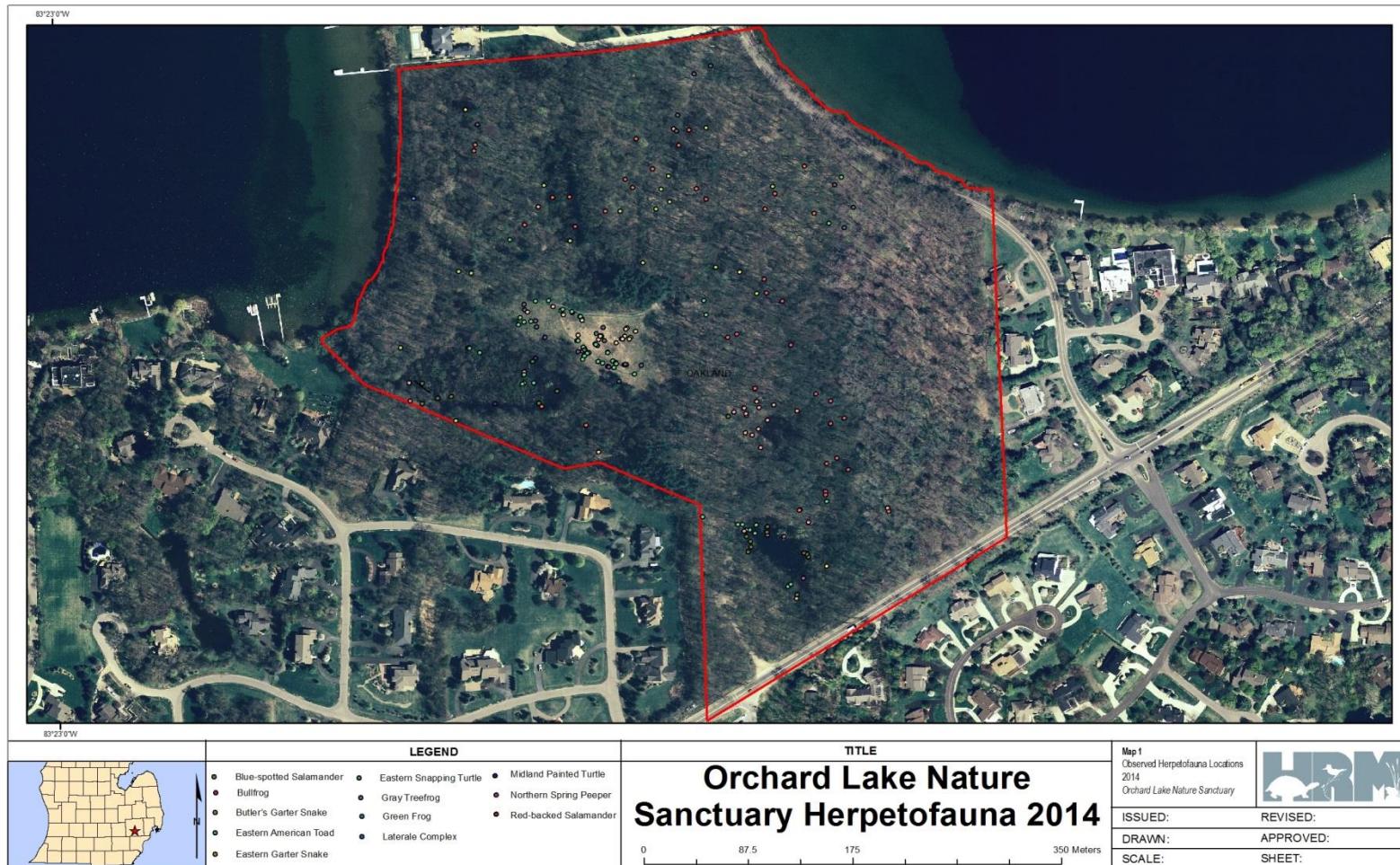
A variety of amphibian and reptile species occupy the Orchard Lake Nature Sanctuary and overall diversity for the region and amount of adjacent developed land is high. Their diversity and relative abundance within the relatively small piece of property is likely in part due to the variety of habitat types that are present. Several species observed during HRM's assessment are sensitive to environmental pollution and disturbance, indicating that this site has high quality habitat present that is capable of supporting these sensitive organisms. Continued maintenance of the site especially the control of invasive vegetation is highly recommended to maintain and improve the quality of the sanctuary so that it may continue to support wildlife but also provide an opportunity for the public to recreate and enjoy nature. Care should be taken with timing, type, and method of application and treatment protocols as this may negatively impact herpetofauna. Additionally because many species of herpetofauna are cryptic and populations can fluctuate, additional surveys and long-term monitoring are strongly encouraged.

## Tables

Orchard Lake Nature Sanctuary Amphibian and Reptile Richness			
Common Name	Scientific Name	Observed	Potential
Amphibians			
Blue-spotted Salamander	<i>Ambystoma laterale</i>	X	
Bullfrog	<i>Rana catesbeiana</i>	X	
Eastern American Toad	<i>Bufo americanus americanus</i>	X	
Eastern Tiger Salamander	<i>Ambystoma tigrinum tigrinum</i>		X
Gray Treefrog	<i>Hyla chrysocelis/ Hyla versicolor</i>	X	
Green Frog	<i>Rana clamitans melanota</i>	X	
Northern Spring Peeper	<i>Pseudacris crucifer crucifer</i>	X	
Red-backed Salamander	<i>Plethodon cinereus</i>	X	
Red-spotted Newt	<i>Notophthalmus viridescens viridescens</i>		X
Spotted Salamander	<i>Ambystoma maculatum</i>	X	
Unisexual Salamander	<i>Ambystoma ssp. hybrid</i>	X	
Western Chorus Frog	<i>Pseudacris triseriata triseriata</i>		X
Wood Frog	<i>Rana sylvatica</i>	X	
Reptiles			
Blanding's Turtle	<i>Emydoidea blandingii</i>		X
Butler' Garter Snake	<i>Thamnophis butleri</i>	X	
Eastern Garter Snake	<i>Thamnophis sirtalis sirtalis</i>	X	
Eastern Milk Snake	<i>Lampropeltis triangulum triangulum</i>		X
Eastern Musk Turtle	<i>Sternotherus odoratus</i>		X
Eastern Snapping Turtle	<i>Cheleydra serpentina serpentina</i>	X	
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	X	
Northern Brown Snake	<i>Storeria dekayi dekayi</i>		X
Northern Map Turtle	<i>Graptemys geographica</i>		X
Northern Red-bellied Snake	<i>Storeria occipitomaculata occipitomaculata</i>		X
Northern Ribbon Snake	<i>Thamnophis sauritus septentrionalis</i>		X
Red-eared Slider	<i>Trachemys scripta elegans</i>	X	

Table 1. Orchard Lake Nature Sanctuary observed and potential herpetofauna species.

## Maps



Map 1. Orchard Lake Nature Sanctuary amphibian and reptile species richness and spatial distribution

## Photos



Photo 1. Pond located near the sanctuary entrance. Water levels were high during the spring.



Photo 2. Emergent marsh adjacent to old field.



Photo 3. Vernal pool conditions in spring.



Photo 4. Old field habitat conditions in spring.



Photo 5. Forested upland conditions in spring.



Photo 6. Old Orchard Trail which divides the sanctuary from Orchard Lake.



Photo 7. Walking trail where logs appear to have been recently moved.



Photo 8. A baited trap set in emergent marsh.



Photo 9. Blue-spotted Salamander found under woody debris.



Photo 10. Spotted Salamander found under woody debris.



Photo 11. Red-backed Salamanders found under woody debris. Note that one is gravid.



Photo 12. Green Frog tadpole caught in a baited trap. Presence of larvae indicates populations are successfully breeding.



Photo 13. American Toad observed in forested upland habitat.

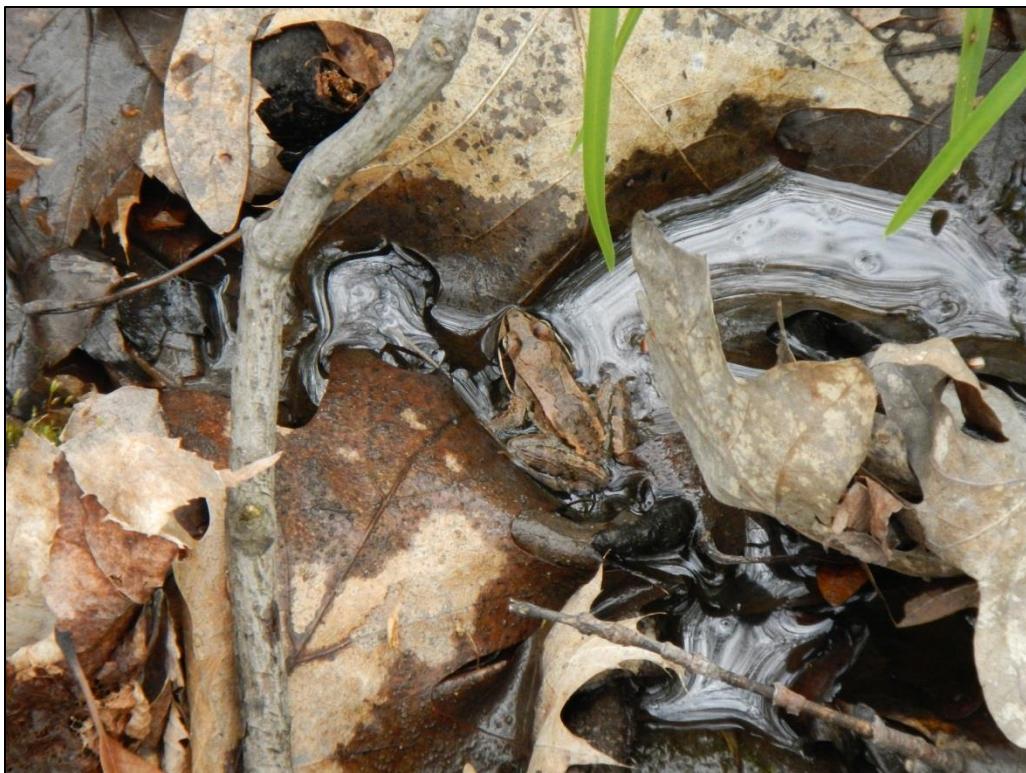


Photo 14. Wood Frog observed in a vernal pool.



Photo 15. Spring Peeper observed resting on vegetation.

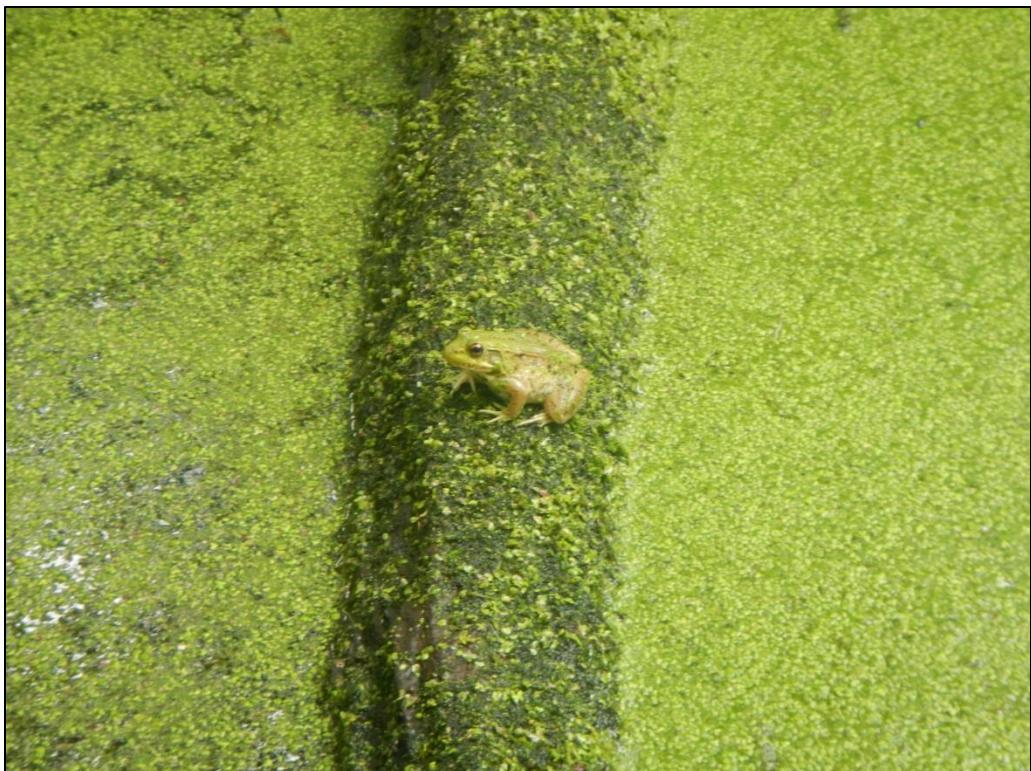


Photo 16. Green Frog observed basking on a log in the pond.



Photo 15. Gray Treefrog adult observed on vegetation.

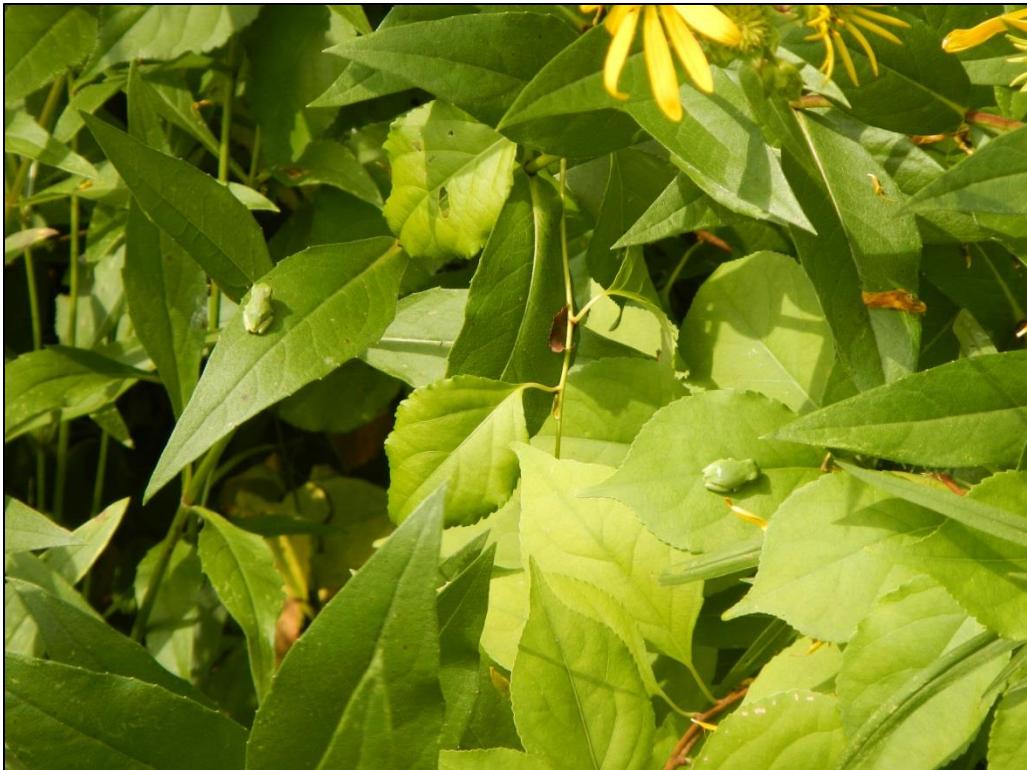


Photo 16. Multiple juvenile Gray Treefrogs observed on vegetation. Various age classes indicate this species is successfully breeding in the site.



Photo 15. Eastern Garter Snake observed in old field habitat.



Photo 16. Midland Painted Turtle caught in the emergent marsh.



Photo 15. Dead juvenile Eastern Snapping Turtle observed on the pond shore in spring. The animal may have died due to winter kill.



Photo 16. Dead Red-eared Slider observed on the pond shore in spring. This may have been the result of winter kill or a released pet.



Photo 15. Invasive vegetation observed in spring. Control of invasives should be considered in future management plans.



Photo 16. Future restoration plans should consider the addition of turtle nesting areas such as the example pictured above.

## References

- Calhoun, A. J. K. and P. G. Demaynadier (2004). "Forestry habitat management guidelines for vernal pool wildlife." Metropolitan Conservation Alliance Technical Paper Series 6.
- Clark-Eagle, A., E. M. Hay-Chmielewski, et al. (2005). Michigan's Wildlife Action Plan. Lansing, MI, Michigan Department of Natural Resources.
- Cooperrider, A. Y., R. J. Boyd, et al. (1986). Inventory and monitoring of wildlife habitat. Service Center, Denver, CO, U.S. Department of the Interior, Bureau of Land Management
- Guilfoyle, M. P. (2010). Implementing herpetofaunal inventory and monitoring efforts on Corps of Engineers project lands. Ecosystem Management and Restoration Research Program. Washington, DC, U.S. Army Corps of Engineers: 43.
- Harding, J. H. (1997). Amphibians and Reptiles of the Great Lakes Region. Ann Arbor, The Michigan University Press.
- Micacchion, M. (2004). Integrated wetland assessment program. Part 7: Amphibian Index of Biotic Integrity (AmphIBI) for Ohio Wetlands Columbus, OH, Ohio Environmental Protection Agency
- Mifsud, D. (2014). Michigan Amphibian and Reptile Best Management Practices. Herpetological Resource and Management Technical Publication, Herpetological Resource and Management, LLC: 168.
- Mifsud, D. A. (2001). Orchard Lake Nature Sanctuary Herpetological Survey, Herpetological Resource and Management
- Welsh, H. H. and S. Droege (2001). "A case for using Plethodontid salamanders for monitoring biodiversity and ecosystem integrity of North American forests." Conservation Biology 15(3): 558-569.