

To Whom It May Concern,

The information in this document is the summary of a series of volunteer reptile and amphibian observations conducted in Hamilton Veteran's Park in Mercer County, NJ. The document has been prepared for the Township of Hamilton. The results presented are from field observations and data collected in 2012, 2013, 2014, and 2015. The data from the first three years was taken informally during morning and evening walks with family. The data from 2015 was taken for a volunteer reptile and amphibian survey performed upon the request of the Township of Hamilton, Mercer County, NJ. This information is presented voluntarily for use in conservation endeavors.

General Profile:

Hamilton Veteran's Park is a 350-acre park managed by the Township of Hamilton in Mercer County, New Jersey. The park features a diversity of habitats within its boundaries, including a field which was the site of a former farm, a wetlands meadow, a smaller upland meadow, several patches of deciduous forest, a man-made lake, temporary and permanent wetlands, an intermittent stream, and several permanent streams. The park is located on the physiographic province known as the inner coastal plain.

Comments on General Fauna:

The Veteran's Park property provides a variety of habitats for native fauna to flourish. Healthy numbers of invertebrates have been observed during the survey. Checking under logs and other cover debris reveals a multitude of native decomposers, such as ants, earthworms, slugs, centipedes, harvestmen, and others. Ticks are occasionally seen in the fields, however most of those observed were dog ticks. Cicadas (especially swamp cicadas), field crickets, and katydids are frequently heard within the park. Six-spotted tiger beetles are common. Several species of invertebrate larvae were also found in the streams. Dragonflies and damselflies are common in the areas around permanent water. The native wildflowers attract many species of bees, wasps, hornets, butterflies, and moths. Among the butterflies observed have been monarch butterflies, cabbage white, red admiral, and swallowtail butterflies such as the tiger swallowtail. Especially common are the red-spotted purple butterflies. Many species of spiders are present, including several orb weavers (including *Araneus* and *Micrathena*), jumping spiders (*Salticidae*) wolf spiders (*Lycosidae*), orchard weavers (*Leucauge*), funnel weavers (*Tenegaria*), fisher spiders (*Dolomedes tenebrosus*), and others. Of particular note was a specimen of the black widow spider (*Latrodectus variolus*) found under a log in 2013. This specimen was photographed, and the photos are available upon request.

The lake harbors healthy numbers of at least several species of fish. Fishing in the lake has produced carp, bullhead catfish, and sunfish. Large numbers of catfish, sunfish, and unknown minnows have been seen in the stream and the lake. Carp have been observed spawning in the mouth of the stream closest to the lake. Larger fish (unknown species) have been observed breaking the surface of the lake from time to time. Wading birds (herons, egrets) are commonly seen fishing in the lake, and bald eagles have been seen removing fish from the lake as well.

A healthy diversity of bird species has been observed on the property. Many species of year-round residents, as well as winter and summer residents and some migrants, were observed within the boundaries of the park. Bird data has also been recorded and will be provided with this report.

Several mammal species were either directly observed, or interpreted through tracks or sign, including gray squirrels, Eastern cottontail rabbits, raccoons, skunks, red fox, and white-tailed deer. Several rodents (mice, voles, etc.) were observed in the meadows but were not identified.

Survey Methodology:

The herpetological data collected during this project was taken using both visual and auditory surveys. Visual surveys were done for species by searching likely habitat, as well as turning cover objects on land and adjacent to water. Species-specific surveys were done using patterns in breeding phenology and habitat preferences for various species. Coverboards were employed for use in collection of snake data. Visual and auditory vernal pool surveys were done during spring emergence to check for vernal pool breeders. Auditory frog call surveys were done in the evenings during appropriate times of the year, as well as incidental frog call data collected during daytime surveys. Care was taken not to excessively disturb any sensitive habitat, such as vernal pools or rotting logs. The specimens were not harmed, nor were they unnecessarily handled. In 2015, snake specimens were frequently handled to be checked for signs of *Ophidiomyces* infection, and no signs were found to be present on specimens. No equipment was used that might transmit fungal infections. All data was recorded to include the date, time of visit, and weather conditions. In lieu of a GPS, a map was printed and divided into sections, and the locations of the specimens were reported in reference to the sections on the map. All recorded data will be provided along with the report.

Cumulative Assessment Total-Complete Species List for 2012-2015 for Hamilton Veteran's Park (11 species)*

- Red-backed salamander (*Plethodon cinereus*)
- Fowler's toad (*Anaxyrus fowleri*)
- Northern gray treefrog (*Hyla versicolor*)
- Northern spring peeper (*Pseudacris crucifer crucifer*)
- American bullfrog (*Lithobates catesbeianus*)
- Northern green frog (*Lithobates clamitans melanota*)
- Eastern snapping turtle (*Chelydra serpentina*)
- Eastern painted turtle (*Chrysemys picta picta*)
- Eastern box turtle (*Terrapene carolina carolina*)
- Eastern garter snake (*Thamnophis sirtalis sirtalis*)**
- Eastern rat snake (*Pantherophis alleghaniensis*)**

*The red-eared slider was found but was not reported, as it is a non-native species

**There are no venomous snake species found within the park*

Data Breakdown:

1. Totals:

- Turtles (3 species)
- Frogs/Toads (5 species)

- Salamanders (1 species)
 - Snakes (2 species)
 - Total (11 species)
2. Park/State Comparison for this assessment-totals of each for Vet's Park/Cypress Lane Woods vs. statewide totals documented by NJ Fish and Wildlife (**including** extirpated species):
- Salamanders 1/16 (6%)
 - Frogs and Toads 5/16 (31%)
 - Turtles 3/13 (23%)
 - Lizards 0/3 (0%)
 - Snakes 2/23 (9%)
 - Total 1/71 (16%)
3. Park/County Comparison corrected for number of species potentially present in Mercer County as documented by NJ Fish and Wildlife (**not** including extirpated species):
- Salamanders 1/11 (9%)
 - Frogs and Toads 5/11 (46%)
 - Turtles 3/11 (27%)
 - Lizards: 0/2 (0%)
 - Snakes: 2/15 (13%)
 - Total: 13/50 (22%)

Species of Special Interest:

4. Endangered/threatened species found: none
5. Species of Special Concern (2*): <http://www.state.nj.us/dep/fgw/ensp/pdf/spclspp.pdf>
- Fowler's toad (*Anaxyrus fowleri*)
 - Eastern box turtle (*Terrapene c. carolina*)

*These species are listed as Species of Special Concern by the State of New Jersey, as there is concern over their habitat loss and their vulnerability because of it. With box turtles, there is also concern about illegal collecting. Of potential interest to park administration is that several dead box turtles (with broken plastrons) were found in 2014 after the wetlands meadow was mowed during the summer. Regarding the Fowler's toad, this once common species is declining throughout its range in NJ. Only a single specimen of the Fowler's toad has been found in Veteran's Park throughout the survey, and no breeding vocalizations were heard on any of the survey dates.

Vernal Pool Breeders:

Many amphibians and some reptiles use temporary pools created by snowmelt or spring rains. These pools are selected by amphibians largely because of the lack of fish predation on the tadpoles. In some cases, amphibians will use permanent ponds such as those located in the meadows in Veteran's Park, provided that they are free of potential predators, and provided that the pools contain water for the duration of the development of the tadpole. There are at least two such ponds in Veteran's Park (personal observation). Vernal pool breeders are classified as either *obligate breeders*, which are species that must use a vernal pool to breed, or *facultative species*, which will gravitate toward vernal pools if available, but will use other semi-permanent or permanent wetlands if vernal pools are not found.

6. Obligate vernal pool species found: None
7. Facultative vernal pool species found (7)
 - Snapping turtle (*Chelydra serpentina*)
 - Eastern painted turtle (*Chrysemys p. picta*)
 - Fowler's toad (*Anaxyrus fowleri*)
 - Bullfrog (*Lithobates catesbaeianus*)
 - Northern green frog (*Lithobates clamitans melanota*)
 - Northern gray treefrog (*Hyla versicolor*)
 - Northern spring peeper (*Pseudacris crucifer crucifer*)

Comments on Potential Breeding Populations:

Hamilton Veteran's Park maintains a respectable diversity of reptiles and amphibians. Their consistent presence serves as a reliable indicator of an ecosystem capable of sustaining them, as well as potentially sustaining populations of other fauna that may serve as their predators or prey. There is confidence that many populations of the individual species found in the area are breeding populations, and steps toward their conservation should be considered. The following are examples that illustrate the presence of breeding populations of these species:

- 1) Presence of snapping turtle hatchling found in Autumn of 2012.
- 2) Presence of full spring peeper, green frog, and gray treefrog choruses demonstrating advertisement calls and territorial vocalizations (behaviors indicative of breeding activity) in many locations within the park.
- 3) Presence of breeding ponds (vernal pools) in Veteran's Park and Cypress Lane Woods.
- 4) Discovery of Eastern box turtle specimen digging nest and laying eggs in meadow, as well as 'nest digs', which are nests likely excavated by raccoons in search of eggs.
- 5) Discovery of neonate garter snakes, incapable of traveling far from place of birth.
- 6) High population densities of painted turtles, green frogs, bull frogs, and garter snakes.
- 7) Presence of at least one painted turtle hatchling observed in Veteran's Park, moving from an upland site toward water.

The biotic and abiotic factors informally observed in these surveys also suggest that this area has the potential to support other reptile and amphibian species. It is possible that other species may be present within close proximity of the park, and their populations may reach a density that would pressure the species to expand its range into the park.

Other Species of *Possible Occurrence* (3):

- Northern water snake (*Nerodia sipedon sipedon*)
- Northern black racer (*Coluber constrictor*)
- Southern/intergrade ringneck snake (*Diadophis punctatus*)

The species of possible occurrence are listed above because of the presence of prey and habitat (including potential hibernacula) within the property that will support these species, and the fact that the property is within their natural range in New Jersey. Although this list is speculative, it details species that may potentially occur and were not discovered because of the limitations of the survey, and it also may detail species which may have historically occurred but no longer breed or exist on the property. This list does not include species historically present in Mercer County which are considered extirpated from New Jersey (e.g. the queen snake, *Regina septemvittata*), nor does it speculate the presence of any rare or endangered species that may currently occur within Mercer County (e.g. the wood turtle, *Glyptemys insculpta*).

The first species, the Northern water snake, is typically observed occasionally to very frequently in appropriate habitat within its range. Its habitats include any aquatic habitat, of varying nature, that will provide prey and adequate cover. Northern water snakes have even been observed in amphibian breeding pools (pers. observation). The absence of sightings for this species in Veteran's Park is unusual, as this snake should be at least occasionally present in the lake and/or stream. It is possible, if not likely, that this species is present at this location because of suitable habitat and prey.

The second species of possible occurrence is the Northern black racer. This nonvenomous colubrid snake is not a constrictor as its Latin name suggests, but is a dietary and habitat generalist known for occasionally being ophiophagous and resistant to the venom of the pitvipers on which it sometimes feeds where their range is shared. This species occurs in Mercer County, and is sometimes common in fields bordering wooded areas. A healthy breeding population of this species is present within the Cypress Lane woods, adjacent to the park (pers. observation). The park property contains appropriate prey, habitat and hibernacula for this species, therefore it is listed as being of possible occurrence.

The final species of possible occurrence, the ringneck snake, is a harmless colubrid which has an unusually patchy distribution within Mercer County, common in some areas and nearly or completely absent in others. Several records of the Southern ringneck snake exist from the nearby Cypress Lane Woods (pers. observation). This small snake is a dietary generalist and often feeds on insects, earthworms and slugs. Because of the proximity of an existing population, and because of the presence of suitable prey and habitat, it is possible that this snake exists on this property.

Advisories:

- 1) The red-eared slider (*Trachemys scripta elegans*) has been found in the lake, and in the wetlands adjacent to the lake (see data). The red-eared slider is not a native turtle, and is sometimes

problematic as an invasive species in the presence of native turtles. Red-eared sliders are often taken from their native habitat for the pet trade, and the owners of these turtles sometimes release them back into the wild for various reasons. These turtles may introduce diseases where they are released, and they often outcompete native turtles for basking sites. Basking is a crucial activity for turtles, especially to build the immune system post-hibernation, and also during times of stress such as illness. Based on numbers, it is likely that the red-eared slider has established a breeding population at Veteran's Park.

- 2) In 2013, the Township of Hamilton had a vernal pool survey done and the Veteran's Park property was surveyed. The presence of wood frog (*Lithobates sylvaticus*) egg masses was reported. The area mapped in the report was thoroughly checked on several occasions during the amphibian spring emergence, and no wood frog vocalizations were heard and none were seen in the area or any area within the park.

Recommendations:

- 1) Leave coverboards for future checks. Coverboards often take several years to develop a full moisture seal, making them more attractive for thermoregulation and ecdysis (shedding). Also, rodents will sometimes nest under these boards over time, and some species of snakes will follow rodent scent trails and establish themselves beneath the boards. Any further discoveries will be documented and the updated report sent to the Township of Hamilton.
- 2) Consider meadow mowing at time of year when box turtle activity is decreased or at minimum, or consider raising mower deck by several inches. This will also help to protect ground-nesting birds.

Limitations of the Survey:

As with all reptile and amphibian surveys, incidence of occurrence may be skewed by weather patterns, long-term wet or dry spells, and existing habitat preferences. The latter may be exemplified by some existing immovable cover (ex. metal storage bins), or other existing areas convenient for thermoregulation (ex. animal burrows) providing shelter for certain snakes that would consequently not shelter under the coverboards. Timing of visits with breeding phenology is occasionally problematic. Therefore, any lack of herpetofauna diversity reported in the totals may not be a reflection of the actual number of species present, but instead may reflect limitations on time spent assessing the area, incorrect timing, or other biotic or abiotic environmental factors.

It should be noted that the data collected in 2015 was very likely limited by several abnormally dry periods, which would inhibit the breeding activity of many amphibians. It is likely that the data taken from this time period does not accurately represent the breeding activity in years with typical amounts of precipitation.

Acknowledgements and Thanks:

Permission was given for the initiation of this survey by Mr. Marty Flynn, Director of Parks and Recreation for Hamilton Township. The survey was enthusiastically supported by Mr. Marty Flynn, and also by Mr. Kevin Flynn, the General Supervisor of Parks for Hamilton Township. Mr. Kevin Flynn, along with one of his crew members, generously provided coverboards and help with the placement of them. Captain DeBoskey of the Hamilton Township Police Department coordinated permission with Mr. Flynn to grant access to the park at night.

Mr. Mark Witmer, as well as several members of the Washington Crossing Audubon Society, held a bird walk at the park on the morning of May 3rd, 2015, and allowed me to accompany them and collect data to be provided to the parks. Mr. Ian Biazzo, naturalist for the Monmouth County Parks Commission, accompanied me for the entire day on May 3rd, and helped to collect bird data in the morning, as well as helping with the collection of herpetological data in the afternoon. Mr. and Mrs. Richard Van Kirk, local birders, invited me to accompany them on the annual Christmas Bird Count at the end of 2014. Mr. Art Dabronzo, a local photographer, helped to provide leads for bird, reptile and amphibian sightings within the park. Mr. Bill Pitman, a local birder, provided leads for bird sightings and helped with confirmation of bird identification on several occasions.

Summary:

This survey was performed in the interest of the documentation of any reptile and amphibian species present at this location. The presence of healthy populations of reptiles and amphibians are indicative of the overall health of an ecosystem, and amphibians are especially regarded as ‘indicator species’ because of their sensitivity to habitat destruction and the pollution of their breeding ponds. Amphibians, because of their permeable skin, are especially vulnerable to the effects of xenobiotics in the environment, and amphibians are typically regarded as a crucial link between aquatic and terrestrial ecosystems in terms of the food web in the environment.

Hamilton Veteran’s Park appears to maintain a diversity of reptiles and amphibians comparable to those expected in a clean open-space area in Central New Jersey.

The data for this survey was collected and vouchered on a volunteer basis. This data was collected to the best of ability and all specimens were personally observed and positively identified. These specimens were photo vouchered when and where possible and these photographs are available upon request.

Thank you for your consideration,

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