

# **Pheasant Branch and Belfontaine Conservancy Faunal Inventory**



**Town of Springfield**  
**City of Middleton**  
**Middleton, Wisconsin**

*Prepared for:*

**Friends of Pheasant Branch**  
**Dane County Parks Commission**  
**Wisconsin Department of Natural Resources**

# City of Middleton

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## 1. Introduction

This project focuses on the Pheasant Branch and Belfontaine Conservancy, a contiguous 503-acre tract owned by the City of Middleton, Dane County Parks Department, and the Wisconsin Department of Natural Resources (DNR). The Belfontaine parcel is a former farmstead owned by Vern Frederick, located along Pheasant Branch Road on the northwest side of Lake Mendota in Middleton, WI. The Dane County Parks Department, the City of Middleton, and the DNR purchased the parcel in spring, 1994 because of its exceptional natural and cultural features. The site itself is in the Town of Springfield and borders the City of Middleton to the south and east. The Pheasant Branch parcel consists of marsh meadow and forested wetlands fed by seeps, springs and surface water flowing in from Pheasant Branch Creek and two small intermittent streams from the north and west. Steep wooded hills surround the wetlands on the west and east.

The Belfontaine property contains includes 2 springs, which produce 1500 gallons of water per minute. There is a large hill in the northern half of the site that provides scenic views of Lake Mendota, the Madison skyline, Pheasant Branch Marsh, and the surrounding hills of Dane County. There is a remnant dry prairie along the southwestern slope of the hill; a significant attribute given so little prairie remains in Wisconsin.

One of the two springs located in the southern section of the Belfontaine property serves as the headwaters of Pheasant Branch Marsh, which runs south from its origin through the marsh. This spring produces 900 gallons of water per minute. The smaller branch of the creek to the west of the farmhouse foundation contains another spring, which produces 600 gallons of water per minute. Wet prairie, sedge meadow, and shrub carr in this area form the transitional communities between the marsh and the prairie/savanna complex.

Some of the Conservancy, the marsh and some areas immediately adjacent to the marsh exist in a naturally vegetated state. However, much of the Conservancy is in non-native vegetation. The marsh provides habitat for waterfowl and migrating birds in the spring and fall. The marsh also provides habitat for many other native wildlife species. Species of note include sandhill cranes (*Grus canadensis*) and the threatened Blanding's turtle (*Emydoidea blandingi*). Nine endangered, threatened, or rare plants have been identified in the marsh at some time in the past and several varieties of fish, notably northern pike (*Esox lucius*), previously used the marsh

for spawning.

It is likely that some of the habitat has changed over the years and may no longer support some of these species. Restoration efforts, recommended by the Master Plan, will also change the vegetative characteristics of the landscape. Consequently, the diversity and abundance of native animal species within the Conservancy would also be expected to change.

Comprehensive inventory information is a key element in monitoring environmental trends and assessing the impacts of urbanization on natural resources. A comprehensive survey is also a very powerful education tool that can show the wide diversity of life supported in the Conservancy if incorporated into educational materials for future Conservancy visitors. Although the request for proposals intended for the Master Plan to include a faunal survey, that aspect of the study was not included in the consulting contract. Therefore, this report provides base line information on the fauna of the Conservancy to supplement the Master Plan to adequately plan for the habitat needs of the wildlife in the Conservancy and to guide and evaluate the implementation of the vegetative restoration sections of the Master Plan.

The purpose of this faunal inventory was to survey the wildlife and evaluate habitat in the Pheasant Branch and Belfontaine Conservancies (hereafter referred to as the Conservancy) in order to guide future restoration and management efforts. I collected existing data from various sources and new information from my own field surveys to establish some baseline of existing wildlife. A DNR pilot wetland monitoring project, which includes some wildlife inventory work in the Conservancy, will add to our present knowledge. The work described here will provide a useful start for monitoring long-term trends.

My faunal inventory involved surveys for small, medium and large mammals, birds, reptiles, amphibians, fish, and insects. Each survey recorded what species I found in the Conservancy between May and August 1999. I also included the recorded observations of other people and have listed them in the appendices at the end of this paper. I could not determine population sizes or dynamics from this study because the research time was too short. This paper addresses my methods, results and discusses the significance of each survey.



## 2. Methods

### 1. Mammal Survey

To test species presence, I trapped small mammals in two, four-day duration sessions starting 7 July and 6 August 1999. I used small and medium Sherman live traps, and pitfall traps for the small mammal survey, baited with peanut butter, apples and carrots. I set trap groups in representative habitat throughout the Conservancy.

I set Sherman traps in six groups of fourteen traps each (7 small traps, 7 medium), and one group of 16 traps (8 small, 8 medium), for a total of 100 traps. I placed some traps in 20 m x 20 m grids, at 5 m intervals. Four of the six grids of fourteen traps had three rows of four traps and one row of two traps each, alternating small and medium sized traps (Figure 1). I then placed these grids in different habitat types around the Conservancy as portrayed in Figure 2. I located the traps as follows:

- A. 14 traps in a grid on the northwest corner of the hill in a transition zone of prairie, brush, and wooded cover
- B. 14 traps in a grid in the upper central portion of the remnant prairie on the west slope of the hill
- C. 16 traps arranged in a half-circle of alternating small and medium sizes. This group was located on the transition of woods and grass just north of the main springs, forming a cap around the springs



- D. 14 traps arranged in a zig-zag transect of alternating small and medium traps (Figure 3) on the transition of brush, sedges, and cattails south of the springs, on the western creek edge
- E. 14 traps in a grid equidistant from the house foundation and the springs on the line of sight between the two, in reed-canary grass and Canada thistles
- F. 14 traps in a grid 50m due South of site E, among sedge hummocks
- G. 14 traps in a straight transect of alternating small and medium traps running north-south, with its head at the Southeast corner of the driveway bridge to the house foundation. This transect ran through sedges, reeds, grasses and willows, and over the highly variable terrain

I checked the traps during early morning and late afternoon. Trapped animals were marked for future identification then released on site. I used five colors of non-toxic paint applied in unique combinations of color and location on each animal (behind ears, shoulders, hips, tail base and tip). Finally, I noted any sightings, trails, scat, tracks, mounds, nests, tunnels, or food caches that I observed.

I also checked four strings of pitfall traps twice daily in two, four-day duration sessions starting 7 July and 6 August 1999. A pitfall is a hole in the ground that traps small animals such as small mammals, salamanders, frogs, lizards and snakes. I used two large coffee cans to prevent escape. The two large coffee cans (one with the base removed) are taped together, forming a tall cylinder with one closed end. I buried this so that the top of the cylinder was flush with the soil surface. I spaced the cans 15 m apart and created a fence connecting the cans in order to increase the capture rates. The pitfalls were supplied with peanut butter and apple slices. This fence consisted of one-foot wide pieces of landscaping fabric stapled to the top half of two-foot lengths of drywall lathe. I pounded the lathe into the ground until the lower edge of the fabric was flush with the ground surface. I then placed excess soil from the holes for the cans around the base of the fabric so that animals could not slip under the fence without digging. Figure 4 diagrams a generic setup; the left pit has a cover and the right pit is uncovered. An animal will encounter the fence, but if it can't find an easy way over, under or through, it will travel along the fence and fall in one of the pits. I placed a cover on stilts above the openings of the cans to prevent exposure of the trapped animal to the elements. The animal could easily walk under the cover, fall in the pit, but also be protected from sun and rain. I chose the layout of each group of cans to follow the natural contours of the land, with fences between cans arranged to run parallel or perpendicular to the chosen feature (Figure 5). My purpose was to intercept any animal going to, coming from, or moving parallel to the chosen feature in the path of this trap system.

I set four of these pitfall systems up as follows:

- A. 6 pits arranged in a "J" shape if viewed from north to south, and is located south of the driveway, east of the bridge, and west of the house foundation in a reed canary grass and sedge wet meadow
- B. 5 pits in a "T" configuration, facing north, located near east of the seep, and far west of the springs
- C. 4 pits in a "T" configuration, facing east, located south and west of the springs, in the reeds and brush
- D. 5 pits in a "T" configuration, facing northwest, at the southern extent of the remnant prairie

(Figure 6)

I used Tomahawk live traps for my survey of medium mammals. I trapped for two four-day sessions starting on 7 July and 6 August 1999. I used nine large and nine medium Tomahawk traps baited with peanut butter sandwich cubes, apples and carrots. The peanut butter sandwich cubes attracted granivores, carnivores, herbivores, insectivores, and omnivores. The carrots and apples were more appealing to the herbivores. The

door on a Tomahawk trap is triggered by pressure on the treadle, located on the trap's floor (Figure 7). The animal, in pursuit of bait at the rear of the trap, must fully enter to step on the treadle and thus be trapped. I checked the traps twice daily and marked any animals caught before releasing them. I applied five colors of non-toxic paint in unique combinations of color and location on each animal. Here again I noted any sightings, trails, scat, tracks, mounds, nests, calls, tunnels, or food caches.

I placed five sets of Tomahawk traps throughout the Conservancy. Figure 8 shows the location of each of the tomahawk trap sites, where 14-point stars represent large tomahawks and 4-point stars represent medium Tomahawk traps. The configuration and location of these traps was as follows:

- A. 2 large and 2 medium Tomahawks placed on the western slope and top of the hill. One of each size was placed in the shade of overhead trees and brush, and one of each in the open prairie remnant
- B. 2 medium and 2 large Tomahawks interspersed over the barren ground under the trees and brush capping the northern extent of the springs
- C. 2 large and 2 medium Tomahawks nestled between sedge hummocks and brush on the western edge of the creek, 50 m south of the springs
- D. 1 of each Tomahawk size located in the reed-canary grass and thistles between the house foundation and the springs
- E. 2 of each size Tomahawk arranged in the sedge, reed canary grass and thistles south and west of the house foundation, and east of the seeps South of the driveway bridge.

It is difficult and expensive to trap large mammals, but it is easier to detect their presence by other means. I relied on sightings, trails, scat, tracks, mounds, nests, beds, calls, tunnels, and food caches observed as I worked in the Conservancy between 20 May 1999 and 2 September 1999.

I gathered data from people visiting or living near the Conservancy, which helped me to greatly expand the species list. Glen and Joan Pulver contributed their mammal observations from 1986 to 1999. Pat Trochlell and Tom Bernthal also submitted their field notes from the summer of 1999.

## 2. Bird Survey

Many people, using various techniques over differing time spans contributed data on birds for this survey. I did not trap birds, but relied on calls and visual sightings, or both. I relied heavily on the birding skills of Pat Trochlell and Tom Bernthal to identify the birds we heard and saw. Pat, Tom and I used a modified timed meander method for both migratory and resident species identification. We also used the Marsh Monitoring recordings to play calls that normally elicit a response from quiet and reclusive birds, allowing us to note their presence without seeing them. For each official inventory, we recorded every bird we heard in the vicinity in a thirty-minute period. I also noted nests as I found them.

I obtained additional data from Pat and Tom on birding surveys when I was not present. I also copied Glen and Joan Pulver's birding notes that extended back to 1986. One full year of additional data from Vicky Nuzzo's field notes from 1988 is included in Appendix F.

## 3. Reptile Survey

I surveyed the reptiles in the Conservancy using three methods. The first method was a walk-through search of basking spots. Many turtles, snakes, and lizards bask in the morning and afternoon sun, making themselves

easily observed. I saw many reptiles while walking along the creek and its side channels or along any rocky outcrops on the hill and at the house foundation.

My second method was similar, but more opportunistic in that I recorded reptiles I encountered as I worked in the Conservancy throughout the summer. The walking paths created by my traveling to the traps seemed to be frequently traversed by both snakes and mammals.

The last reptile inventory method I used involved coverboards acting as "snake magnets." I placed ten 2x2 ft plywood boards (coverboards) on 2x2x4 in legs on a cleared piece of ground. I then covered the boards with nearly 2 ft of grass clippings and left them to bake in the sun. Figure 9 diagrams a snake magnet without the grass clipping cover. The air space under the board remained warm long after the sun set due to fermentation of the clippings and radiant heat collection. The ectothermic snakes rely heavily on environmental heat sources, so these boards would be, theoretically, very attractive. I placed the coverboards where they would house the greatest number of species. Bob Hay, Dick Bautz, Tom Bernthal, Guerdon Coombs, Pat Trochlell and I determined on the locations of the boards. I put two boards on the hill, and twelve others at sites in the meadows between the driveway bridge, the house foundation, the springs, and the east-side neighborhood. These positions are designated by letters in Figure 10.

- A. In Canada thistles and a few sedges west of the large woodchip pile at the house foundation on a west-facing slope
- B. In Canada thistles and a few sedges, a slightly wetter locale than A
- C. In sedges and Canada thistles in a much wetter location than A or B
- D. On a south-facing hill in Canada thistles and a few sedges south west of the house foundation
- E. In a low wet Canada thistle dominated seep south of the house foundation
- F. In a relatively dry patch of Canada thistles, sedges, and grasses east of the small seep
- G. In the wet sedge-dominated patch south west of the main springs
- H. In the relatively dry Canada thistle dominated section between the house foundation and the main springs
- I. On the border of the wetland and wet meadow near the DNR fence surrounding the main springs
- J. In the dry grass and Canada thistle southeast facing slope south and east of the fence gate surrounding the main springs
- K. Lower and more south and east of J in more sedge dominated vegetation
- L. Higher and straight east of J in the same vegetation
- M. Lower than J and straight east of K in the same vegetation as J
- N. Under the brush of honeysuckle on the south facing point of the hill
- O. West of the treeline on the top of the hill in the remnant prairie

Glen and Joan Pulver recorded reptile activity in the Conservancy from 1986 to 1999, and Pat Trochlell and Tom Bernthal recorded reptiles during the summer of 1999.

#### 4. Amphibian Survey

My amphibian survey employed pitfalls (those from the small mammal survey), call sessions, and minnow traps baited with liver and Glo-Stiks. I did not mark the animals caught, but looked for any egg masses, watched for animals, and listened for calls. Salamanders have been successfully surveyed using pitfalls, but frogs are able to jump or climb out of the cans.

The pitfalls I set up for the small mammal survey were designed to catch salamanders and small frogs. The same theories and methods of the mammals survey apply to this aspect of the amphibian survey. The details of the pitfall setups and locations were the same as described in Section 2.1.

Tom Bernthal, Pat Trochlell and I used the Wisconsin Frog and Toad Survey rating system to classify calling intensity of amphibians in the Conservancy.

I trapped for salamanders by placing a minnow trap in the pond directly east of the City's blacktop parking lot, off of Pheasant Branch Rd. I baited the minnow trap with liver, and a Glo-Stik (Figure 11). Bob Hay and Dick Bautz suggested this combination to capture both adult and larval salamanders. The Glo-Stiks emit light, which attracts invertebrates. The larval salamanders are attracted to the invertebrates and get caught in the trap. The liver attracts adult salamanders, and once they enter the trap it is hard for them to find their way out through the small entrance. I placed the trap in the pond once daily and checked the following morning. Beside these surveys, I noted any time that I crossed a toad or frog as I worked in the Conservancy.

## 5. Fish Survey

I walked along the bank in mid-May, 1999 as Pat and Tom shocked (electrofished) in the creek just below the main springs. They used a backpack shocker to survey fish. The electric current from a 12-volt battery carried on the backpack frame temporarily stuns any aquatic organism within the current's range. A cathode and anode, connected to the battery, extend into the water in front of and behind the person shouldering the backpack. Temporarily stunned animals float to the water surface, where they are scooped up with a fish net, identified, and returned to the water. The current has less stunning power as the size of the organism or its muscle mass decreases.

The minnow trap I used in the amphibian survey doubled as a fish surveyor in the pond directly east of the County's blacktop parking lot, off of Pheasant Branch Rd.

I also interviewed Glen and Joan Pulver to see if they had any other species or data to add.

## 6. Insect Survey

In July, Dick Bautz and I surveyed the remnant prairie (southwest corner of the hill in the Conservancy) specifically for red-tailed leaf-hoppers (*Aflexia rubranura*). The location and habitat available are ideal for colonization, as the site has numerous prairie dropseed grass (*Sporobolus heterolepis*) clusters. We surveyed using sweep nets brushed vigorously over the ground, with hand aspirators, and with Dick's motorized lawn vacuum.

I contacted the DNR through Dick Bautz and Rich Henderson to obtain a list of species they have found in the Conservancy. Most of the survey work they have done has focused on the Belfontaine hill and especially on its remnant prairie. The data they collected will be included in the WDNR Prairie Invertebrate Study 053. The report is in progress.



**Canadian Tiger  
Swallowtail**

## 3. Results

### 3.1 Mammal Results

**Table 2. Species Numbers per Sherman Site**

Sherman Sites	<i>Peromyscus</i> spp.	<i>Microtus pennsylvanicus</i>	<i>Sorex cinereus</i>	<i>Spermophilus tridecemlineatus</i>	<i>Zapus hudsonius</i>
A	35	3	0	5	0
B	24	24	1	4	0
C	10	12	0	2	4
D	2	10	1	0	6
E	4	6	0	8	0
F	8	1	2	0	2
G	1	5	2	0	0
Totals	84	61	6	19	12

**Table 1. Species Caught per Trap Period in Small and Medium Sherman Traps**

Sherman Traps	<i>Peromyscus</i> spp.		<i>Microtus pennsylvanicus</i>		<i>Sorex cinereus</i>		<i>Spermophilus tridecemlineatus</i>		<i>Zapus hudsonius</i>	
	Small	Medium	Small	Medium	Small	Medium	Small	Medium	Small	Medium
7-Jul-99 AM	5	5	1	3	0	1	0	1	0	1
7-Jul-99 PM	0	1	0	2	0	0	0	0	0	0
8-Jul-99 AM	4	0	2	1	0	0	1	0	0	0
8-Jul-99 PM	5	6	3	4	0	0	0	1	1	1
9-Jul-99 AM	1	3	3	3	0	0	0	0	0	1
9-Jul-99 PM	6	1	3	1	0	0	1	0	0	1
10-Jul-99 AM	0	3	2	3	0	1	0	1	0	0
10-Jul-99 PM	2	4	3	2	0	0	1	1	0	0
6-Aug-99 AM	2	2	3	2	1	0	0	1	1	0
6-Aug-99 PM	1	0	0	0	0	0	1	0	0	1
7-Aug-99 AM	5	3	2	3	0	0	0	0	1	0
7-Aug-99 PM	4	3	2	1	0	0	0	2	0	1
8-Aug-99 AM	2	4	2	2	0	0	0	0	0	0
8-Aug-99 PM	5	5	3	1	2	0	2	3	0	1
9-Aug-99 AM	0	0	0	1	0	0	0	0	0	1
9-Aug-99 PM	5	2	1	3	1	0	2	1	1	0
Trap Type Totals	47	42	30	32	4	2	8	11	4	8
Species Totals	89*		62*		6		19		12	

\* Three *Peromyscus* spp. were caught twice each and one was caught three times, for a total of 84 deer or whitefooted mice. One *Microtus pennsylvanicus* was caught twice, for a total of 61 meadow voles.

The five species of small mammals caught using Sherman traps were white-footed/deer mice (*Peromyscus leucopus/maniculatus*), meadow voles (*Microtus pennsylvanicus*), masked shrews (*Sorex cinereus*), thirteen-lined ground squirrels (*Spermophilus tridecemlineatus*), and meadow jumping mice (*Zapus hudsonius*) (Table 1). There were four recaptures of mice. I caught one meadow vole twice (trap site B). I had no recaptures of shrews, thirteen-lined ground squirrels or meadow jumping mice. The number of species I recorded at each trap site are in Table 2.

**Table 3. Species Caught in Pitfall Traps**

		<i>Sorex Cinereus</i>	<i>Microtus pennsylvanicus</i>	<i>Zapus hudsonius</i>
7-Jul-99	AM	3	3	0
7-Jul-99	PM	1	3	0
8-Jul-99	AM	1	2	0
8-Jul-99	PM	4	3	0
9-Jul-99	AM	2	2	1
9-Jul-99	PM	0	1	1
10-Jul-99	AM	3	1	0
10-Jul-99	PM	2	0	0
6-Aug-99	AM	6	0	1
6-Aug-99	PM	1	3	2
7-Aug-99	AM	3	2	0
7-Aug-99	PM	3	1	0
8-Aug-99	AM	1	0	0
8-Aug-99	PM	0	1	0
9-Aug-99	AM	4	1	1
9-Aug-99	PM	2	1	0
Totals		36	24	6

**Table 4. Species Numbers per Pitfall Site**

Pitfall Site	<i>Sorex cinereus</i>	<i>Microtus pennsylvanicus</i>	<i>Zapus hudsonius</i>
A	18	13	0
B	7	6	2
C	6	4	4
D	5	1	0
Totals	36	24	6

I used pitfalls as a second technique to survey small mammals. The species I caught were masked shrews, meadow voles, and meadow jumping mice (Table 3). The total number of individuals of each species caught per trap site is listed in Table 4.

Pitfall trapping did not add additional species to the species list. However, it did trap many more masked shrews than any other technique. Other small mammals I observed but did not trap for were bats, moles and chipmunks. There were mole tunnels and mounds all over the hill and throughout the drier meadow areas. I saw bats at dusk on the hill and in the middle of the marsh. The two chipmunks were on the edge of the woods at the top of the remnant prairie, just outside the mowed path and wooden fence. I did not trap any of these three species, however, it is likely (based on sight, sound and geography according to H.H. Jackson's Mammals of WI and Kurt's Mammals of the Great Lakes Region) that the bats were little brown myotis (*Myotis lucifugus*), the moles were eastern moles (*Scalopus aquaticus*), and the chipmunks were eastern chipmunks (*Tamias striatus*).

**Table 5. Species Caught in Medium and Large Tomahawk Traps**

Tomahawk Traps	<i>Didelphis virginiana</i>		<i>Procyon lotor</i>		<i>Marmota monax</i>		<i>Sylvilagus floridanus</i>		
	Medium	Large	Medium	Large	Medium	Large	Medium	Large	
7-Jul-99	AM	0	0	0	0	0	0	1	
7-Jul-99	PM	0	0	0	0	0	1	0	
8-Jul-99	AM	0	0	0	0	1	0	2	
8-Jul-99	PM	0	0	0	0	0	0	0	
9-Jul-99	AM	0	1	0	0	0	0	1	
9-Jul-99	PM	0	0	0	0	0	1	1	
10-Jul-99	AM	0	0	0	1	0	1	2	
10-Jul-99	PM	0	0	0	0	0	0	1	
6-Aug-99	AM	0	0	0	0	0	0	0	
6-Aug-99	PM	0	0	0	0	0	0	1	
7-Aug-99	AM	0	0	0	0	0	1	0	
7-Aug-99	PM	1	0	0	0	0	1	0	
8-Aug-99	AM	3	0	0	0	0	0	0	
8-Aug-99	PM	1	1	0	0	0	0	0	
9-Aug-99	AM	2	1	0	0	0	2	1	
9-Aug-99	PM	3	0	0	0	1	0	0	
Trap Type Totals		10	3	0	1	2	3	1	
Species Totals		13*		1		3		16*	

\* Three young opossums comprise all the captures from 7 July-9 August, so there were only 4 opossums caught. Likewise, four rabbits were caught twice each, so there were only 12 rabbits caught.

**Table 6. Species Numbers per Tomahawk Site**

Tomahawk Sites	<i>Didelphis virginiana</i>	<i>Procyon lotor</i>	<i>Marmota monax</i>	<i>Sylvilagus floridanus</i>
A	1	0	3	8
B	3	0	0	2
C	0	1	0	0
D	0	0	0	1
E	0	0	0	1
Totals	4	1	3	12

The species I caught using medium and large Tomahawk traps included the Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), woodchuck (*Marmota monax*), and eastern cottontail (*Sylvilagus floridanus*) (Table 5). Three young opossums were caught numerous times each at trap site B and one adult was trapped once at trap site A. Also, I caught four cottontails twice each (Table 6). Tom Bernthal and Pat Trochlell observed a mink in spring 2000.

The large mammal survey suggested the existence of only two large mammals. I heard, saw, and found marks and tracks of white-tailed deer (*Odocoileus virginianus*). Canine tracks and scat were observed. Both coyotes (*Canis latrans*) and domestic dogs (*canis familiaris*) frequent the area. Track conditions typically lacked definition, making identification unreliable.

Vicky Nuzzo's observations from 1988 can be found in Appendix F. Pat Trochlell and Tom Bernthal, Glen and Joan Pulver, and Guerdon Coombs also have observations recorded in Appendix B.

## 2. Bird Results

I saw and heard many bird species in the Conservancy (Appendix C: Bird Results). Additionally, the observations of Tom Bernthal, Pat Trochlell, Glen Pulver, and Joan Pulver are listed in this Appendix. Vicky Nuzzo's observations from 1988 can be found in Appendix F.

### 3.3 Reptile Results

Eastern garter snakes (*Thamnophis sirtalis*) were found under the coverboards (Table 7). However, other snakes were observed throughout the Conservancy as I worked (Table 8). The pitfall fencing added Dekay's (northern brown) snake (*Storeria dekayi*) to the list of species. During the summer, three painted turtles (*Chrysemys picta*) were seen sunning themselves just below the springs. Eastern garter snakes and painted turtles were quite common throughout the Conservancy.



**Table 8. Other Snake Observations**

Date	Location
24-Jun-99	5 garters on woodchip pile at house foundation caught Dekay's brown snake in pitfall site A
26-Jun-99	1 garter on woodchip pile
1-Jul-99	1 garter on gravel path to top of hill
6-Jul-99	1 garter in grass of house foundation

**Table 7. Garter Snake Occurrence Under Coverboards**

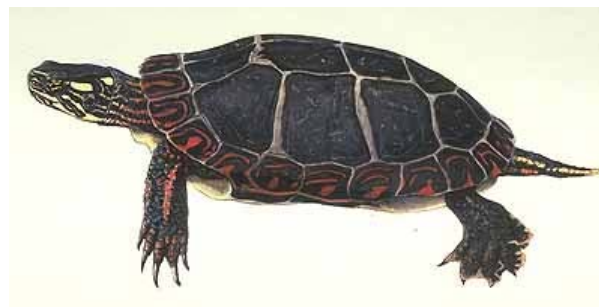
Coverboard	12-Jun-99	26-Jun-99	10-Jul-99	24-Jul-99	7-Aug-99	21-Aug-99	Total Recordings	Total # Individuals
A	0	0	1	0	0	0	1	1
B	0	1	0	0	0	1	2	1
C	0	1	1	3	2	2	9	3
D	1	2	3	3	3	3	15	3
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	1	1	1	3	1
H	0	3	3	3	2	2	13	3
I	1	3	3	4	3	3	17	4
J	0	1	1	1	2	2	7	2
K	1	2	2	2	2	2	11	2
L	1	3	3	3	3	3	16	3
M	0	0	1	1	1	1	4	1
N	0	2	3	3	3	3	14	3
O	0	0	1	0	1	0	2	2
<b>Total</b>	<b>4</b>	<b>18</b>	<b>22</b>	<b>24</b>	<b>23</b>	<b>23</b>	<b>114</b>	<b>29</b>

Glen and Joan

Pulver's notes from 1986 to 1999 record reptile activity in the Conservancy. The couple observed many large snapping turtles (*Chelydra serpentina*), and even witnessed the struggle as one large snapper caught and drowned an adult drake mallard duck (*Anas platyrhynchos*).



Vicky Nuzzo's observations from 1988 can be found in Appendix F.



### 3.4 Amphibian Results

The only amphibians found with the minnow trap were 2 small green frogs (*Rana clamitans*), 1 on August 16 and the other on August 18, 1999. In addition, I observed the presence of many frogs and toads, but did not



find salamanders.



Call survey were not initiated until after the spring peepers (*Hyla crucifer*) had finished calling, and the chorus frogs (*Pseudacris triseriata*) were nearly finished. Many green frogs and American toads (*Bufo americanus*) were heard (Appendix D).

Pat Trochlell caught several pickerel frogs (*Rana palustris*) in the main springs area. Three leopard (*Rana pipiens*), 5 green, and 2 chorus frogs were found in the cattails in the center of the Conservancy. One Copes gray treefrog (*Hyla chrysoscelis*) was heard near the pond sampled for salamanders. Vicky Nuzzo's observations from 1988 can be found in Appendix F.

## 5. Fish Results

The fish species recorded (Table 9) were all small enough to fit through the 1" square minnow trap entrance. Larger adult fish like sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), bass (*Micropterus salmoides*) and carp (*Cyprinus Carpio*) were not surveyed. The sticklebacks (*Culaea inconstans*) and central mudminnows (*Umbra limi*) that were caught were adults.

**Table 9. Minnow Trap Results**

Species	Date							
	16-Aug-99	17-Aug-99	18-Aug-99	19-Aug-99	20-Aug-99	21-Aug-99	22-Aug-99	23-Aug-99
Carp	1	0	2	4	3	0	1	2
Stickleback	1	1	3	1	1	2	0	1
Central Mudminnow	0	0	0	1	0	0	0	1
Bluegill	0	1	1	0	0	0	1	0
Green Sunfish	1	0	0	0	0	1	0	0
Largemouth Bass	0	1	0	2	0	0	0	0

The electrofishing for fish occurred concurrently with that for amphibians (Appendix E). Glen and Joan Pulver's notes on fish are also included in Appendix E. Vicky Nuzzo's observations from 1988 can be found in Appendix F.

## 6. Insect Results

The insects caught while surveying for red-tailed leafhoppers will be published in Richard Henderson's report on the WDNR Prairie Invertebrate Study 053.

## 4. Discussion

Small mammals are good indicators of habitat quality because they tend to be less mobile during the summer than many other species. By understanding the role they play in their ecosystem, and preserving or restoring the composition, structures, and functions of the system, many other species will benefit. If a species is living in an area, most of its needs are probably being met. Some large, mobile, or generalist mammal species may be able to use an area as part of their range, but they may need to move to other areas to find the components, structures or functions for their complete life cycles. If a sampled area lacks some expected small mammal species, it may reflect a significant alteration of local landscape suitability or a seasonal or cyclic population variation. Small mammals can be numerous yet rarely observed in a woodland, prairie, or wetland. Though rarely seen, they serve many critical functions in an ecosystem such as dispersing seeds, controlling insect numbers, adding nutrients to the soil with their droppings, aerating the soil, providing food to other species, and providing hibernacula for insects and reptiles. Medium-sized and large mammals have larger home-ranges and often tend to be more dispersed across the landscape.

Most of the mammal species I expected to find in the Conservancy were present. I did not find Franklin's ground squirrels despite trapping specifically for them. Nor did I find any prairie voles, water shrews or arctic shrews. Due to time constraints, I did not trap bats. I did not trap as many of some generalists, such as opossum and raccoon, as I expected considering the proximity of residential development, but I saw their tracks often. Other generalist species such as deer thrive the Conservancy. Deer have excellent cover and wintering grounds with few predators, and residents along the boundary of the Conservancy feed them. Coyotes and raccoons are other common generalist species that readily adapt their natural diet of mammals, birds, fish, reptiles and amphibians with human-supplied food.

Of all the animal classes supported by the Conservancy, birds are the most diverse. Different species use the area for certain parts of their life cycle. Some use the area for breeding and raising young, others for food and shelter, and still others as a rest-stop during migrations. The presence of open water year-round helped to make the Conservancy's bird list large.

Reptiles are also common in the Conservancy; however, the species list I compiled through surveying is not very large. A more extensive survey is needed to make more quantitative judgments of species characteristics. The "snake magnets" were left in the field, and those not crushed by the brushhog will continue to house reptiles for the next few years. More data could be collected and perhaps more species identified if these remaining snake magnets are continually monitored.

Amphibians were also common in the Conservancy. Frogs made up the majority of the species list, but I didn't find salamanders. A more thorough and longer search may reveal tiger salamanders.

The small pond I selected for salamander sampling contained many small fish. Water closer to the springs contained fewer species, perhaps due to colder, clearer, lower nutrient, moving water. The Conservancy floods in the spring, which may allow redistribution of fish overwintering in the isolated ponds formed when

the water level drops.

Our picture of the insects of Pheasant Branch and Belle Fountain is far from complete. The survey I participated in concentrated on finding red-tailed leaf-hoppers. The remnant prairie area is ideal, according to Dick Bautz. More surveying for invertebrates in the Conservancy is needed.

## 5. Conclusion

This faunal inventory required a tremendous amount of work and yielded a large list of species present in the Pheasant Branch and Belfontaine Conservancy, but it is only a start. A continuous inventory, with each survey conducted by one or more dedicated individuals would produce the most complete list and the start of an understanding of faunal and floral dynamics in the Conservancy. This is a nearly surrealistic wish due to economic constraints, and because volunteers with experience are hard to secure. One person, attempting to collect positive identification of all forms of animal life during one summer is sure to miss some. I spread my surveys spatially and temporally to allow completion of each by the end of the summer. This did not allow me to thoroughly survey in every habitat type, nor for every faunal group. I chose "representative" habitat as assessed by experts in the field. Despite these constraints, I feel the inventory was successful, identified some basic challenges, and the results can help direct future management in the Conservancy.





## 6. Appendix A: Total Species List

The culmination of all the surveys can be found in Tables 10 and 11. Table 10 is a species list I compiled from all the surveys and interviews pertaining to mammals, reptiles and amphibians. Table 11 (on the following page) is a species list I compiled from all the surveys and interviews pertaining to birds. These lists are **not complete**, as I only surveyed one summer and public observations are generally biased toward conspicuous, adaptive, or abundant animals.

Table 10. List of All Non-Avian Species Observed in the Conservancy Since 1986

	Common Name	Scientific Name		Common Name	Scientific Name
Mammals	Deer or Whitefooted Mouse	<i>Peromyscus spp.</i>	Reptiles	Snapping Turtle	<i>Chelydra serpentina</i>
	Meadow Vole	<i>Microtus pennsylvanicus</i>		Painted Turtle	<i>Chrysemys picta</i>
	Masked Shrew	<i>Sorex cinereus</i>		Eastern Garter Snake	<i>Thamnophis sirtalis</i>
	13-Lined Ground Squirrel	<i>Spermophilus tridecemlineatus</i>		Dekay's Brown Snake	<i>Storeria dekayi</i>
	Meadow Jumping Mouse	<i>Zapus hudsonicus</i>			
	Eastern Mole	<i>Scalopus aquaticus</i>	Amphibians	Northern Spring Peep	<i>Pseudacris crucifer</i>
	Eastern Chipmunk	<i>Tamias striatus</i>		Chorus Frog	<i>Pseudacris triseriata</i>
	Gray Squirrel	<i>Sciurus carolinensis</i>		Copes Gray Tree Frog	<i>Hyla versicolor chrysoscelis</i>
	Bat	<i>Myotis spp.</i>		Green Frog	<i>Rana clamitans</i>
	Opossum	<i>Didelphis virginiana</i>		Northern Leopard Frog	<i>Rana pipiens</i>
	Raccoon	<i>Procyon lotor</i>		Wood Frog	<i>Rana sylvatica</i>
	Woodchuck	<i>Marmota monax</i>		Pickereel Frog	<i>Rana palustris</i>
	Eastern Cottontail	<i>Sylvilagus floridanus</i>	American Toad	<i>Bufo americanus</i>	
	Striped Skunk	<i>Mephitis mephitis</i>			
	Muskrat	<i>Ondatra zibethicus</i>	Fish	Central Mudminnow	<i>Umbra limi</i>
	Red Fox	<i>Vulpes fulva</i>		Carp	<i>Cyprinus Carpio</i>
	Gray Fox	<i>Urocyon cinereoargenteus</i>		Brook Stickleback	<i>Culaea inconstans</i>
	Coyote	<i>Canis latrans</i>		Green Sunfish	<i>Lepomis cyanellus</i>
	White-tailed Deer	<i>Odocoileus virginianus</i>		Bluegill	<i>Lepomis macrochirus</i>
Mink	<i>Mustela vison</i>	Largemouth Bass		<i>Micropterus salmoides</i>	

Vicky

Nuzzo's observations from 1988 can be found in Appendix F.



**Table 11. Total Bird Species Observed in the Conservancy Since 1986**

<b>Hérons, Bitterns</b>	<b>Sandpipers</b>	<b>Thrushes</b>
Great Blue Heron	Greater Yellowlegs	American Robin
Green Heron	Solitary Sandpiper	Wood Thrush
Great Egret	American Woodcock	Hermit Thrush
American Bittern	Common Snipe	<b>Kinglets</b>
<b>Waterfowl</b>	<b>Gulls, Terns</b>	Blue-gray Gnatcatcher
Canada Goose	Ring-billed Gull	Ruby-crowned Kinglet
Mallard	<b>Pigeons, Doves</b>	<b>Gnatcatchers</b>
American Black Duck	Mourning Dove	Blue-gray Gnatcatcher
Gadwall	Rock Dove	<b>Starlings</b>
Northern Pintail	<b>Typical Owls</b>	European Starling
Green-winged Teal	Great Horned Owl	<b>Vireos</b>
Blue-winged Teal	Barred Owl	Solitary Vireo
Northern Shoveler	<b>Kingfishers</b>	Red-eyed Vireo
Wood Duck	Belted Kingfisher	Warbling Vireo
Ring-necked Duck	<b>Woodpeckers</b>	<b>Wood Warblers</b>
Canvasback	Common Flicker	Black-and-white Warbler
Lesser Scaup	Red-bellied Woodpecker	Yellow Warbler
Common Goldeneye	Red-headed Woodpecker	Yellow-rumped Warbler
Buffelhead	Hairy Woodpecker	Black-throated Green Warbler
Ruddy Duck	Downy Woodpecker	Bay-breasted Warbler
Hooded Merganser	<b>Flycatchers</b>	Common Yellowthroat
Common Merganser	Great Crested Flycatcher	American Redstart
<b>Hawks</b>	Eastern Phoebe	<b>Blackbirds</b>
Sharp-shinned Hawk	Willow Flycatcher	Eastern Meadowlark
Coopers Hawk	Eastern Wood Peewee	Red-winged Blackbird
Red-tailed Hawk	<b>Swallows</b>	Baltimore Oriole
Rough-legged Hawk	Tree Swallow	Common Grackle
Bald Eagle	Rough-winged Swallow	Brown-headed Cowbird
Turkey Vulture	Barn Swallow	<b>Grosbeaks, Finches, Sparrows</b>
Northern Harrier	<b>Jays, Crows</b>	Northern Cardinal
<b>Falcons</b>	Blue Jay	Rose-breasted Grosbeak
American Kestrel	American Crow	Indigo Bunting
<b>Turkey</b>	<b>Titmice</b>	House Finch
Wild Turkey	Black-capped Chickadee	American Goldfinch
<b>Cranes</b>	<b>Nuthatches</b>	Savannah Sparrow
Sandhill Crane	White-breasted Nuthatch	Field Sparrow
<b>Rails</b>	<b>Wrens</b>	Swamp Sparrow
Virginia Rail	House Wren	Song Sparrow
Sora	Marsh Wren	Fox Sparrow
American Coot	Sedge wren	White-throated Sparrow
<b>Plovers</b>	<b>Mimic Thrushes</b>	White-crowned Sparrow
Killdeer	Gray Catbird	Dark-eyed Junco
	Brown Thrasher	House Sparrow
	<b>Pheasant</b>	
	Ring-necked Pheasant	

## 7. Appendix B: Mammal Results

**Table 12. Mammals Observed by Tom Bernthal and Pat Trochlell**

Mammals	Date of Observation										
	4/7/99	4/13/99	4/21/99	4/24/99	5/5/99	5/12/99	6/9/99	6/10/99	6/11/99	6/15/99	6/16/99
13-lined Ground Squirrel											X
Bat							X				
Chipmunk											X
Woodchuck											X
Meadow vole			X								
Mole											X
Raccoon									X		
Skunk									X		
Gray Squirrel									X		
White-tailed Deer									X		

Pat

Trochlell and Tom Bernthal gave me copies of their field notes from the spring and summer of 1999. The wildlife they observed is recorded in Table 12. Their data adds two species, the striped skunk (*Mephitis mephitis*) and a gray squirrel (*Sciurus carolinensis*) to the species list. Vicky Nuzzo's observations from 1988 can be found in Appendix F.

Glen and Joan Pulver have lived in the Woodcreek Condos since 1986. They have a large window and porch overlooking the Conservancy and have kept records of the plants and animals they observed. I interviewed Glen and Joan, and found their notes to expand my list of medium and large mammal species present in the Conservancy. The Pulvers observed gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes fulva*), and muskrat (*Ondatra zibethicus*), three species I did not find. They also noted seeing opossum, woodchuck, and raccoons. The Pulvers have seen deer every year, but noted that in 1997, 55 deer passed through the Conservancy, and one day in 1998 the couple saw 40 deer all at one time in the wetland. Glen and Joan commented on seeing one coyote during the winter (year unknown) and hearing coyotes below their West-facing porch at night.

Guerdon Coombs noted that beaver (*Castor canadensis*) were common in the past, but have not been seen recently.



## 8. Appendix C: Bird Results



**Table 13. Birds Observed by Tom Bernthal and Pat Trochlell Between April 7 and May 16 1999**

Bird	Date of Observation									
	4/7/99	4/13/99	4/21/99	4/24/99	5/5/99	5/12/99	6/9/99	6/11/99	6/15/99	6/16/99
<b>Hérons, Bitterns</b>										
Great Blue Heron			X						X	
Green Heron										
American Bittern				X						
<b>Waterfowl</b>										
Canada Goose	X	X	X							
Mallard	X	X	X		X				2	
Green-winged Teal		1 PAIR	X							
Blue-winged Teal	X		X							
Northern Shoveler		30+	X							
Wood Duck		X	X		X	X				
<b>Hawks</b>										
Sharp-shinned Hawk				X						
Red-tailed Hawk				X						
<b>Falcons</b>										
American Kestrel										X
<b>Cranes</b>										
Sandhill Crane	X	X							X	
<b>Rails</b>										
Virginia Rail									X	
<b>Plovers</b>										
Killdeer	X	X								
<b>Sandpipers</b>										
American Woodcock	X									
Common Snipe		X								
<b>Pigeons, Doves</b>										
Ring-billed Gull	X									
Mourning Dove			X	X					X	
<b>Typical Owls</b>										
Great Horned Owl	X									
Barred Owl					X					
<b>Kingfishers</b>										
Belted Kingfisher				X		X		X		
<b>Woodpeckers</b>										
Common Flicker		X	X	X						X
Red-bellied Woodpecker		X			X	X		X	2	
Hairy Woodpecker					X			X		
Downy Woodpecker		X			X			X		
<b>Flycatchers</b>										
Great Crested Flycatcher					X	X		2		
Eastern Phoebe		X								
Willow Flycatcher							2		X	
Eastern Peewee								X		X
<b>Swallows</b>										
Tree Swallow		X						X	3	
Rough Winged Swallow									3	
Barn Swallow		X							3	
<b>Jays, Crows</b>										
Blue Jay					X	X		2	X	
American Crow		X	X			2		2		2
<b>Titmice</b>										
Black-capped Chickadee		X	X		X	X		X	X	
<b>Nuthatches</b>										
White-breasted Nuthatch					X	X		2		
<b>Wrens</b>										
House Wren					X	X		X	X	X
Marsh Wren									3	
Sedge wren							X		X	X

The bird species recorded in the Conservancy during the summer of 1999 are found in Table 13. Pat Trochlell and Tom Bernthal compiled this list of species and dates when they were seen or heard.

**Table 13 Cont'd. Birds Observed by Tom Berntal and Pat Trochlell Between April 7 and May 16, 1999**

<b>Mimic Thrushes</b>										
Gray Catbird							X	2	2	X
Brown Thrasher										X
<b>Thrushes</b>										
American Robin	X	X	X		X	X		X	2	
Wood Thrush					X	X				
<b>Kinglets</b>										
Blue-gray Gnatcatcher									X	
Ruby-crowned Kinglet				X						
<b>Starlings</b>										
European Starling		X				X		X	X	
<b>Vireos</b>										
Solitary Vireo						X				
Red-eyed Vireo								X		
Warbling Vireo									2	
<b>Wood Warblers</b>										
Black-and-white Warbler						X				
Yellow Warbler						X			3	X
Yellow-rumped Warbler					X					
Black-throated Green Warbler						X				
Bay-breasted Warbler					X					
Common Yellowthroat						X		X	2	X
American Redstart						X				
<b>Blackbirds</b>										
Eastern Meadowlark		X							X	X
Red-winged Blackbird	X	X					X	X	5	X
Baltimore Oriole						X		X	X	
Common Grackle									2	X
Brown-headed Cowbird		X		X	X				X	X
<b>Finches</b>										
Northern Cardinal		X			X	X		2	2	X
Rose-breasted Grosbeak					X	X		X		X
Indigo Bunting								X		
House Finch			X	X					X	
American Goldfinch		X	X	X		X		2	4	2
Field Sparrow										X
Swamp Sparrow		X								
Song Sparrow		X		X			X	X	2	X

Tom and Pat saw the following additional species since 16 May 1999: Cooper's Hawk, Red-headed Woodpecker, White-crowned Sparrow and White-throated Sparrow.



Glen and Joan Pulver observed additional species between 1986 and 1999. They noted seeing the birds listed in Table 14.

**Table 14. Bird Species Recorded from an Interview with Glen and Joan Pulver**

Bird	Glen Pulver's Notes	Bird	Glen Pulver's Notes
	1986-1999		1986-1999
<b>Hérons, Bitterns</b>		<b>Turkeys</b>	
Great Blue Heron	8-10 at times	Turkey	3
Green Heron	X	<b>Cranes</b>	
American Bittern	X	Sandhill Crane	X
<b>Waterfowl</b>		<b>Rails</b>	
Canada Goose	>100 one AM	American Coot	X
Mallard	X	<b>Plovers</b>	
American Black Duck	Many in winter	Killdeer	X
Gadwall	X	<b>Sandpipers</b>	
Northern Pintail	X	Greater or Lesser Yellowlegs	X
Green-winged Teal	X	Solitary Sandpiper	X
Blue-winged Teal	X	Common Snipe	X
Northern Shoveler	X	<b>Gulls, Terns</b>	
Ring-necked Duck	X	Gulls	X
Canvasback	X	<b>Typical Owls</b>	
Lesser Scaup	X	Great Horned Owl	X
Common Goldeneye	rare	Barred Owl	X
Bufflehead	rare	<b>Woodpeckers</b>	
Ruddy Duck	X	Common Flicker	X
Hooded Merganser	rare	<b>Nuthatches</b>	
Common Merganser	X	White-breasted Nuthatch	X
<b>Hawks</b>		<b>Blackbirds</b>	
Sharp-shinned Hawk	X	Red-winged Blackbird	X
Red-tailed Hawk	X	Baltimore Oriole	Pair in dead tree
Rough-legged Hawk	X	Common Grackle	X
Bald Eagle	X	<b>Finches</b>	
Gray Hawk (Northern Harrier)	X	Savannah Sparrow	X

By combining the list from Pat and Tom with that from Glen and Joan, a total of 102 species have been recently observed in the Conservancy. This combined list can be found in Appendix A: Total Species List.

Glen and Joan also had a few stories of dates that stood out. In the fall of 1986 the couple was amazed at a collection of 3-4000 ducks of many species gathered in the marsh. In 1987 they saw 15-20 greater yellowlegs (*Tringa melanoleuca*) gather near the creek during a rainstorm. Glen observed bald eagles (*Haliaeetus leucocephalus*) flying through in 1996 and 1998, and has pictures of one eating a dead fish on the bank of the creek during the winter.

The Pulvers have even recorded the annual avian patterns in the marsh, especially as related to the resident pair of sandhill cranes. Between winter and spring black ducks abound in the open waterway of the marsh. In spring, the carp make the water boil with spawning activity. Sandhill cranes arrive in groups of two to four or five in March. The resident pair drives the chicks away with aggressive behavior that lasts two to three days. In April and May the resident adult sandhill cranes create a nest on the barren peninsula between the brush and water in the marsh. They feed on young shoots. The Pulvers noted that the 1999 spring thaw created a lake in the marsh, little wild rice grew and non of that year's chicks survived. May and June is duck migration time. Many species, including blue and green winged teal, shovelers, widgeon, gadwalls, and pintail stop over in the marsh. During the summer, many young and some mature ducks fall prey to snapping turtles. Glen watched one day as a mallard drake fought for one-half hour to free itself from a large snapping turtle, but eventually lost.

A combined list of birds observed by Glen Pulver, Pat Trochlell, Tom Bernthal and Cherrie Warren can be found in Table 15.

**Table 15. Bird Species Observed in the Conservancy Since 1986 by Glen Pulver, Pat Trochlell, Tom Bernthal and Cherrie Warren**

<b>Herons, Bitterns</b>	<b>Sandpipers</b>	<b>Thrushes</b>
Great Blue Heron Green Heron Great Egret American Bittern	Greater Yellowlegs Solitary Sandpiper American Woodcock Common Snipe	American Robin Wood Thrush Hermit Thrush
<b>Waterfowl</b>	<b>Gulls, Terns</b>	<b>Kinglets</b>
Canada Goose Mallard American Black Duck Gadwall Northern Pintail Green-winged Teal Blue-winged Teal Northern Shoveler Wood Duck Ring-necked Duck Canvasback Lesser Scaup Common Goldeneye Buffelhead Ruddy Duck Hooded Merganser Common Merganser	Ring-billed Gull	Ruby-crowned Kinglet
	<b>Pigeons, Doves</b>	<b>Gnatcatchers</b>
	Mourning Dove Rock Dove	Blue-gray Gnatcatcher
	<b>Typical Owls</b>	<b>Starlings</b>
	Great Horned Owl Barred Owl	European Starling
	<b>Kingfishers</b>	<b>Vireos</b>
	Belted Kingfisher	Solitary Vireo Red-eyed Vireo Warbling Vireo
	<b>Woodpeckers</b>	<b>Wood Warblers</b>
	Common Flicker Red-bellied Woodpecker Red-headed Woodpecker Hairy Woodpecker Downy Woodpecker	Black-and-white Warbler Yellow Warbler Yellow-rumped Warbler Black-throated Green Warbler Bay-breasted Warbler Common Yellowthroat American Redstart
	<b>Flycatchers</b>	<b>Blackbirds</b>
	Great-crested Flycatcher Eastern Phoebe Willow Flycatcher Eastern Wood Peewee	Eastern Meadowlark Red-winged Blackbird Baltimore Oriole Common Grackle Brown-headed Cowbird
<b>Hawks</b>	<b>Swallows</b>	<b>Grosbeaks, Finches, Sparrows</b>
Sharp-shinned Hawk Coopers Hawk Red-tailed Hawk Rough-legged Hawk Bald Eagle Turkey Vulture Northern Harrier	Tree Swallow Rough-winged Swallow Barn Swallow	Northern Cardinal Rose-breasted Grosbeak Indigo Bunting House Finch American Goldfinch Savannah Sparrow Field Sparrow Swamp Sparrow Song Sparrow Fox Sparrow White-throated Sparrow White-crowned Sparrow Dark-eyed Junco House Sparrow
<b>Falcons</b>	<b>Jays, Crows</b>	
American Kestrel	Blue Jay American Crow	
<b>Turkey</b>	<b>Titmice</b>	
Wild Turkey	Black-capped Chickadee	
<b>Cranes</b>	<b>Nuthatches</b>	
Sandhill Crane	White-breasted Nuthatch	
<b>Rails</b>	<b>Wrens</b>	
Virginia Rail Sora American Coot	House Wren Marsh Wren Sedge Wren	
<b>Plovers</b>	<b>Mimic Thrushes</b>	
Killdeer	Gray Catbird Brown Thrasher	
	<b>Pheasant</b>	
	Ring-necked Pheasant	

Vicky Nuzzo's observations from 1988 can be found in Appendix F.

## **9. Appendix D: Amphibian Results**

One survey technique followed the Wisconsin Frog and Toad Survey protocol. Tom Bernthal, Pat Trochlell and I listened to vocal amphibians (i.e. breeding frogs and toads) and rated their vocalizations on a scale of 1-3, with 1 being able to distinguish each calling individual and 3 being unable to distinguish individuals because they are so numerous. On April 7, 1999 chorus and wood frogs were recorded. On June 9, 1999, American toads were heard in the distance, chorus frogs were singing at level 2 and green frogs were singing at level 2. On June 10, 1999 green frogs were recorded singing at level 3. Since this time, Tom and Pat have heard or seen pickerel frogs and leopard frogs.

Vicky Nuzzo's observations from 1988 can be found in Appendix F.



## 10. Appendix E: Fish Results

Pat Trochlell and Tom Bernthal conducted some electrofishing surveys in the waters flowing from the springs. They found many brook sticklebacks and some central mudminnows. They also observed adult carp spawning in the marsh, but not while electrofishing.

Glen and Joan Pulver, among many others, noted the large numbers of carp that enter the marsh in the spring for spawning, and keep the slower, warmer waters murky throughout the summer.

Vicky Nuzzo's observations from 1988 can be found in Appendix F. Her list adds more species to these lists.

In 1997 northern pike were netted in large numbers at the Century Avenue Bridge by DNR fisheries biologist Mike Vogelsang.



## 11. Appendix F: Nuzzo Wildlife Observations

Table 16 lists the number of days each species was observed by Vicky Nuzzo during each season in 1988 and the total number of days each was observed.



<b>Table 16. Summary of Wildlife Observations throughout 1988 by Nuzzo</b>					
Species	Winter # of days observed (out of 10 trips)	Spring # of days observed (out of 13 trips)	Summer # of days observed (out of 27 trips)	Fall # of days observed (out of 4 trips)	Total # of days observed (out of 44 trips)
<b>Birds</b>					
American Robin	3	10	15	2	30
Black-capped Chickadee	5	9	11	3	28
American Goldfinch	1	10	15	1	27
Blue Jay	4	7	12	4	27
Common Yellowthroat	0	10	16	0	26
Belted Kingfisher	5	5	8	7	25
Northern Cardinal	5	10	10	0	25
Song Sparrow	3	10	10	2	25
Gray Catbird	0	10	14	0	24
Mourning Dove	2	10	11	0	23
American Crow	1	10	8	3	22
Red-bellied Woodpecker	5	8	5	3	21
Northern Flicker	0	7	10	3	20
Red-winged Blackbird	2	10	7	1	20
Downy Woodpecker	6	7	6	0	19
Eastern Wood-pewee	0	6	12	1	19
Mallard	4	11	3	1	19
Swamp Sparrow	0	9	9	0	18
Common Grackle	3	9	3	0	15
Great Crested Flycatcher	0	9	6	0	15
Rose-breasted Grosbeak	0	10	5	0	15
Sandhill Crane	1	10	1	2	14
Barn Swallow	0	8	5	0	13
Killdeer	2	10	1	0	13
Cedar Waxwing	4	6	0	1	11
House Wren	0	9	1	1	11
Red-tailed Hawk	4	5	0	2	11
Tree Swallow	0	9	2	0	11
Hairy Woodpecker	1	2	3	4	10
Indigo Bunting	0	3	7	0	10
Yellow Warbler	0	10	0	0	10
Brown-headed Cowbird	0	8	1	0	9
Common Snipe	0	4	3	2	9
Great Blue Heron	0	4	5	0	9
Great Horned Owl	2	5	0	2	9
Green Heron	0	4	5	0	9
White-breasted Nuthatch	2	3	2	2	9
American Tree Sparrow	2	5	1	0	8
Ovenbird	0	5	3	0	8
Canada Goose	0	7	0	0	7
Dark-eyed Junco	3	4	0	0	7
Wood Duck	0	2	4	1	7
Wood Thrush	0	0	6	1	7
American Woodcock	0	6	0	0	6
Brown Thrasher	0	4	2	0	6
European Starling	3	3	0	0	6
Northern Waterthrush	0	4	2	0	6
Eastern Meadowlark	0	5	0	0	5
Eastern Phoebe	0	1	1	3	5
Greater Yellowlegs	0	4	0	0	4
Red-eyed Vireo	0	3	1	0	4
Ring-necked Pheasant	1	3	0	0	4
Ruffed Grouse	3	1	0	0	4

<b>Table 16. Summary of Wildlife Observations throughout 1988 by Nuzzo Continued</b>					
Species	Winter # of days observed (out of 10 trips)	Spring # of days observed (out of 13 trips)	Summer # of days observed (out of 27 trips)	Fall # of days observed (out of 4 trips)	Total # of days observed (out of 44 trips)
Sedge Wren	0	0	4	0	4
Field Sparrow	0	0	3	0	3
Lesser Yellowlegs	0	3	0	0	3
Marsh Wren	0	0	3	0	3
Northern Oriole	0	3	0	0	3
Northern Rough-winged Swallow	0	0	3	0	3
Ruby-crowned Kinglet	0	3	0	0	3
Sandpiper (species?)	0	3	0	0	3
Teal (species?)	0	2	1	0	3
Yellow-rumped Warbler	0	3	0	0	3
Blue-gray Gnatcatcher	0	2	0	0	2
Blue-winged Teal	0	2	0	0	2
Chipping Sparrow	0	0	2	0	2
Eastern Kingbird	0	0	2	0	2
Fox Sparrow	0	2	0	0	2
Northern Harrier	0	1	1	0	2
Red-headed Woodpecker	0	1	1	0	2
Sharp-tailed Grouse	0	0	2	0	2
Sora	0	0	2	0	2
White-throated Sparrow	0	1	0	1	2
American Kestrel	0	1	0	0	1
American Redstart	0	0	1	0	1
Black-and -white Warbler	0	0	1	0	1
Brown Creeper	0	1	0	0	1
Common Nighthawk	0	1	0	0	1
Gull (species?)	0	1	0	0	1
Hermit Thrush	0	1	0	0	1
Horned Lark	1	0	0	0	1
House Sparrow	0	1	0	0	1
Owl (species?)	0	0	1	0	1
Rail (species?)	0	0	1	0	1
Ring-billed Gull	0	0	0	1	1
Ruby-throated Hummingbird	0	0	1	0	1
Solitary Sandpiper	0	1	0	0	1
<b>Amphibians and Reptiles</b>					
Eastern Painted Turtle	0	8	6	3	17
Carp	0	2	2	1	5
Snapping Turtle	0	2	2	0	4
Blanding's Turtle	0	0	3	0	3
Chorus Frog	0	1	0	0	1
Spring Peeper	0	1	0	0	1
<b>Fish</b>					
Carp	0	2	2	1	5
<b>Mammals</b>					
Whitetail Deer	1	6	6	1	14
Gray Squirrel	1	5	4	1	11
Muskrat	0	4	3	0	7
Eastern Cottontail	1	1	1	0	3
Opposum	1	0	0	0	1
Mink (?)	0	1	0	0	1
Eastern Chipmunk	0	0	1	0	1

## 12. Appendix G: Conservancy Map

## 13. Appendix H: Contact Information

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