AMPHIBIAN COLONIZATION OF MITIGATION WETLANDS IN PERRY COUNTY, ILLINOIS
FINAL REPORT

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BY:
Jessica R. Jakubanis, Herpetologist
Christopher A. Phillips, Herpetologist
John E. Petzing, Herpetologist
Joseph Doolen, Herpetologist
Illinois Natural History Survey (INHS), Center for Biodiversity
172 Natural Resources Building
607 E. Peabody Drive, Champaign, IL 61820
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INTRODUCTION

Ephemeral wetlands are an essential component of ecological systems in Illinois. They carry out many important functions that are imperative to a thriving environment. Ephemeral wetlands play an important role in flood control, act as reservoirs that trap runoff and reduce erosion, recharge aquifers and sustain other wetlands by entering the groundwater system, act as sediment traps thus improving water quality and slowing the sedimentation of lakes and rivers, filter excess nutrients and pollution from entering major bodies of water, and provide habitat for many unique and diverse organisms, many of which are threatened or endangered, particularly amphibians (Levin et al, 2002). Many amphibian species depend on ephemeral wetlands for their survival. Such environments are typically fish-free, providing a suitable habitat in which these animals may reproduce without the threat of egg predation by fish. The forested ephemeral wetlands at the Perry County Mitigation Site demonstrate the utilization of such environments by amphibians in both reproduction and recruitment of offspring.

The study site (Fig. 1) is a wooded parcel formerly owned by Arch Minerals of the Illinois Mining Company, and was recently annexed to Pyramid State Park. The Perry County Mitigation Site is located 5.7 km southwest of Pinckneyville (Township 6 South; Range 3 West; Section 4; NW). Wetlands were created by the subsidence of coalmines, and the Further Studies Group (INHS) was asked to carry out pre-subsidence and post-subsidence surveys for herpetofauna with an emphasis on amphibians. Pre-subsidence surveys took place in 1998 and focused on gathering baseline information on amphibian and reptile occurrence in the project area. Mine subsidence occurred in February 1999. At that time, two ponds were created in the north-central part of the mitigation site, designated Pond 1 (NAD 83 UTM Zone 16: 4212648mN, 285781mE) and Pond 2 (NAD 83 UTM Zone 16: N4212677m, E285909m) for the purpose of this report. Pond 1 was

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Fig.1 Location of created wetlands at Pyramid State Park, Perry County, IL

formed in a small, pre-existing stream/drainage channel, and Pond 2 is located east-northeast of Pond 1 near

the north edge of the forest. Post-subsidence monitoring of these ponds, focusing on the use of the created wetlands by amphibians, began in the spring of 1999. Nine pond-breeding species were documented in or near these ponds from 1999 to 2001: spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*), Fowler's toad (*Bufo fowleri*), Blanchard's cricket frog (*Acris crepitans blanchardi),* gray treefrog complex (probably Cope's gray treefrog – *Hyla chrysoscelis*), spring pepper (*Pseudacris crucifer*), western chorus frog (*Pseudacris triseriata*), green frog (*Rana clamitans*), and southern leopard frog (*Rana sphenocephala*). Of these species, two were observed as eggs, five were observed as larvae or tadpoles, and five were observed as metamorphs, verifying the reproduction and recruitment of amphibian species at these ponds. Three reptile species were also observed in 1999 and 2000: eastern box turtle (*Terrapene carolina*), broadhead skink (*Eumeces laticeps*), and eastern garter snake (*Thamnophis sirtalis*). This report presents the results of post-subsidence surveys conducted during 2003, and reviews all results from April of 1999 to June of 2003.

METHODS

Dipnetting surveys were conducted to survey amphibians and reptiles at the Perry County Mitigation Site. Amphibians were counted, and dips were kept track of on a dip-per-minute basis. Visual encounter surveys were also performed to survey the amphibians and reptiles. Visual encounter surveys involve searching appropriate habitat, such as turning cover items like logs, rocks, and debris as well as performing visual scans of open habitats. All species encountered are subsequently recorded. A complete explanation of the visual encounter survey is found in Heyer, et al (1994).

RESULTS OF THE FIELD SEASON 2003

The project site was visited on 11 April, 16 April, 23 April, 2 May, 14 May, 21 May, 28 May, 4 June, 11 June, and 18 June 2003. The results of the surveys conducted on these dates are listed below.

Table 1. Amphibians Observed at Pond 1 and Pond 2, Field Season 2003

Spotted Salamander	*Ambystoma maculatum*
Marbled Salamander	*Ambystoma opacum*
Fowler's Toad	*Bufo fowleri*
Spring Peeper	*Pseudacris crucifer*
Green Frog	*Rana clamitans*
Southern Leopard Frog	*Rana sphenocephala*

SITE VISIT 1: 14 March 2003

Pond 1

A dipnetting survey was conducted in the pond. The following amphibians were observed: An undetermined number of marbled salamander larvae and unidentified ambystomatid spermatophores (either smallmouth or spotted salamander). A visual

encounter survey yielded an adult southern leopard frog. Man hours and pond depth were not recorded.

Pond 2
A dipnetting survey was conducted in the pond. The following amphibians were observed: An undetermined number of marbled salamander larvae and unidentified Ambystomatid spermatophores (either smallmouth or spotted salamander). A visual encounter survey yielded the shell of an eastern box turtle. Man hours and pond depth were not recorded.

SITE VISIT 2: 11 April 2003

Pond 1
A dipnetting survey (0.83 man-hours and 150 net sweeps) was conducted in the pond. The following amphibians were observed: 520 marbled salamander larvae and 4 spotted salamander egg masses. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 2 adult spring peepers, 2 adult southern leopard frogs, and 1 adult green frog. The green frog and southern leopard frogs were found on the margin (bank/water interface) of the pond, and the spring peepers were found in the leaf litter several feet away from the pond. Pond depth was not recorded.

Pond 2
A dipnetting survey (0.83 man-hours and 150 net sweeps) was conducted in the pond. The following amphibians were observed: 13 marbled salamander larvae, 55 spotted salamander egg masses, 2 Fowler's toad egg masses, 8 ranid egg masses. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 1 green frog and one southern leopard frog, both found on the margin of the pond. Pond depth was not recorded.

SITE VISIT 3: 16 April 2003

Pond 1
A dipnetting survey (0.83 man-hours and 278 net sweeps) was conducted in the pond. The following amphibians were observed: 128 marbled salamander larvae, 3 spotted salamander egg masses. The maximum pond depth was 47.0 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 4 southern leopard frogs found on margin and others heard calling in the distance, 3 spring peepers found in the leaf litter around the pond perimeter. An eastern box turtle was also found along the margin of Pond 1.

Pond 2
A dipnetting survey (0.83 man-hours and 190 net sweeps) was conducted in the pond. The following amphibians were observed: 10 marbled salamander larvae, 13 spotted salamander egg masses. The maximum pond depth was 19.5 cm. The water was murky and difficult to see through because of recent rains. A visual encounter survey (0.17

man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 2 unidentified small frogs in the leaf litter around the pond perimeter.

SITE VISIT 4: 23 April 2003

Pond 1
A dipnetting survey (1.00 man-hour and 200 net sweeps) was conducted in the pond. The following amphibians were observed: 149 marbled salamander larvae, 3 spotted salamander egg masses. The maximum pond depth was 51.7 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 1 southern leopard frog along margin of pond, 5 unidentified small frogs in the leaf litter around the pond perimeter.

Pond 2
A dipnetting survey (0.83 man-hours and 132 net sweeps) was conducted in the pond. The following amphibians were observed: 16 marbled salamander larvae, 17 spotted salamander egg masses. The maximum pond depth was 25.0 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 1 southern leopard frog along margin of pond, 1 spring peeper in the leaf litter around the pond perimeter.

SITE VISIT 5: 2 May 2003

Pond 1
A dipnetting survey (1.00 man-hour and 350 net sweeps) was conducted in the pond. The following amphibians were observed: 161 marbled salamander larvae, 7 spotted salamander egg masses which appeared hatched. The maximum pond depth was 57.5 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and no other amphibians were observed.

Pond 2
A dipnetting survey (1.00 man-hour and 370 net sweeps) was conducted in the pond. The following amphibians were observed: 26 marbled salamander larvae, 1 spotted salamander egg mass which appeared hatched. The maximum pond depth was 41.5 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and no other amphibians were observed.

SITE VISIT 6: 7 May 2003

Pond 1
A dipnetting survey (1.00 man-hour and 138 net sweeps) was conducted in the pond. The following amphibians were observed: 97 marbled salamander larvae, 5 spotted salamander egg masses that appeared hatched. The maximum pond depth was 58.5 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and 2 unidentified ranids were observed on the margin of the pond.

Pond 2
A dipnetting survey (1.00 man-hour and 156 net sweeps) was conducted in the pond. The following amphibians were observed: 6 marbled salamander larvae. The maximum pond depth was 44.5 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and no other amphibians were observed. However, a gray treefrog was heard calling during the search.

SITE VISIT 7: 14 May 2003

Pond 1
A dipnetting survey (1.00 man-hour and 388 net sweeps) was conducted in the pond. The following amphibians were observed: 79 marbled salamander larvae, 6 spotted salamander larvae, 1 hatched spotted salamander egg mass, 1 large unidentified tadpole, 1 medium unidentified tadpole, 1 small unidentified tadpole. The maximum pond depth was 53.5 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 1 southern leopard frog found along margin of pond, 1 Fowler's toad found in the leaf litter around the pond perimeter.

Pond 2
A dipnetting survey (1.00 man-hour and 200 net sweeps) was conducted in the pond. The following amphibians were observed: 4 marbled salamander larvae, 1 medium unidentified tadpole. The maximum pond depth was 36.0 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and no other amphibians were observed.

SITE VISIT 8: 21 May 2003

Pond 1
A dipnetting survey (0.67 man-hours and 172 net sweeps) was conducted in the pond. The following amphibians were observed: 27 marbled salamander larvae, 6 spotted salamander larvae, 1 hatched spotted salamander egg mass, 1 medium unidentified tadpole. The maximum pond depth was 47.5 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 1 southern leopard frog found on margin of pond.

Pond 2
A dipnetting survey (0.67 man-hours and 237 net sweeps) was conducted in the pond. The following amphibians were observed: 4 marbled salamander larvae. The maximum pond depth was 30.0 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and no other amphibians were observed.

SITE VISIT 9: 28 May 2003

Pond 1

A dipnetting survey (0.83 man-hours and 175 net sweeps) was conducted in the pond. The following amphibians were observed: 11 marbled salamander larvae, 2 spotted salamander larvae, 1 hatched marbled salamander egg mass, 8 small unidentified tadpoles, 1 large unidentified tadpole. The maximum pond depth was 51.0 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and the following amphibians were observed: 1 southern leopard frog was found on the margin of the pond.

Pond 2

A dipnetting survey (0.83 man-hours and 160 net sweeps) was conducted in the pond. No amphibians were observed. The maximum pond depth was 30.5 cm. A visual encounter survey (0.17 man-hours) was conducted on land surrounding the pond, and no amphibians were observed. A Fowler's toad release call was heard, and a broadhead or five-lined skink (*Eumeces fasciatus*) was observed in the woodland on a fallen tree several meters from the pond.

SITE VISIT 10: 4 June 2003

Pond 1

A dipnetting survey (0.17 man-hours and 68 net sweeps) was conducted in the pond. The following amphibians were observed: 2 marbled salamander larvae, 1 spring peeper tadpole. The maximum depth of the pond was 45.5 cm. A visual encounter survey (0.13 man-hours) was conducted on the margin of the pond. Two unidentified small frogs were observed, and upon return to the area after the survey, a southern leopard frog metamorph was observed. Another visual encounter survey (0.15 man-hours) was conducted in the vegetated area around pond and adjacent to pond bank. No amphibians were observed. Incidental encounters post-survey included 1 unidentified tadpole, 1 marbled salamander larva, an old spotted salamander egg mass, and an additional southern leopard frog metamorph.

Pond 2

A dipnetting survey (0.17 man-hours and 55 net sweeps) was conducted in the pond. The following amphibians were observed: 1 tadpole with hind legs, possibly *Hyla*. The maximum depth of the pond was 24.5 cm. A visual encounter survey (0.13 man-hours) was conducted on the margin of the pond, and another visual encounter survey (0.13 man-hours) was conducted in the vegetated area around the pond, neither of which yielded any amphibian observations. An incidental encounter of a *Eumeces* occurred near pond 2 on and around a downed tree (NAD 83 UTM Zone 16: 4212709mN, 285902mE). A nearby field pool (NAD 83) contained hundreds of *Hyla* tadpoles as well as similar numbers of southern leopard frog tadpoles and metamorphs.

SITE VISIT 11: 11 June 2003

Pond 1

A dipnetting survey (0.08 man-hours and 25 net sweeps) was conducted in the pond. The following amphibians were observed: 1 marbled salamander larva, 1 spotted salamander larva. The maximum depth of the pond was 57.5 cm. A visual encounter survey (0.08 man-hours) was conducted on land surrounding the pond. No amphibians were observed, but *Hyla* could be heard calling.

Pond 2

A dipnetting survey (0.08 man-hours and 30 net sweeps) was conducted in the pond. No amphibians were observed. The maximum depth of the pond was 32.5 cm. A visual encounter survey (0.08 man-hours) was conducted on land surrounding the pond. One small frog was observed in the leaf litter, and *Hyla* could be heard calling.

SITE VISIT 12: 18 June 2003

Pond 1

A dipnetting survey (0.17 man-hours and 45 net sweeps) was conducted in the pond. No amphibians were observed during this time. The maximum pond depth was 38.0 cm. A visual encounter survey (0.20 man-hours) was conducted on land surrounding the pond. Seven metamorph southern leopard frogs and a juvenile eastern box turtle were observed. Incidental encounters included an eastern box turtle in the woods to the west of the pond, an adult southern leopard frog to the southeast of the pond, and *Hyla* could be heard day calling.

Pond 2

A dipnetting survey (0.17 man-hours and 60 net sweeps) was conducted in the pond. No amphibians were observed during this time. The maximum pond depth was 31.0 cm. A visual encounter survey (0.20 man-hours) was conducted on land surrounding the pond. Five metamorph southern leopard frogs and 3 adult southern leopard frogs were observed. Another adult southern leopard frog was encountered incidentally to the west of the pond before the surveys were conducted.

DISCUSSION

Twelve visits were made to the project site during the 2003 field season. Six amphibian species were positively identified during the course of surveys, each of which has been previously documented from the project site. In previous years (1999, 2000, 2001) bullfrogs were thought to have been observed, although these observations were based primarily on alarm call. Green frogs produce an alarm call undistinguishable from bullfrogs, so it is quite possible that green frogs were the actual species observed. During the 2003 field season, two green frogs and no bullfrogs were observed, lending to the possibility that, in previous years, green frogs may have been mistakenly identified as bullfrogs.

Several amphibian species that had been observed in previous years were not observed in relation to the two forest ponds in this year. Such species include the western chorus frog (eggs, metamorphs, and adults in 1999 and 2000), cricket frogs (adults in 1999, 2000, 2001), gray treefrog larvae (1999) and metamorphs (2000), southern leopard frog larvae (1999), spring peeper metamorphs (1999), Fowler's toad metamorphs (2000), tiger salamander eggs (2000), and an adult spotted salamander. In addition, adult garter snakes had been observed in 1999 and 2000 but not in this year's study. The broadhead skink, which was observed in 2000, was not verified this year, although an observation of *Eumeces sp.* did occur.

Tables 2 and 3 and Figures 1 and 2 document the amphibians and reptiles observed at ponds 1 and 2, respectively, throughout the entire post-subsidence study period. Species are listed in order of their observance, and each species' reproductive status at the time of observation is presented.

Table 2. Amphibians and Reptiles Observed in Pond 1

Species	Reproductive Status	Date
Fowler's Toad	adults seen but no eggs observed	7-Apr-99
Western Chorus Frog	adults seen/heard and eggs observed	7-Apr-99
Southern Leopard Frog	adults seen but no eggs observed	7-Apr-99
Gray Treefrog Complex	adults heard but no eggs observed	20-Apr-99
Western Chorus Frog	adults heard but no eggs observed	20-Apr-99
Southern Leopard Frog	adults seen but no eggs observed	20-Apr-99
Pseudacris sp.	eggs and/or larvae observed	20-Apr-99
Fowler's Toad	adults seen but no eggs observed	6-May-99
Cricket Frog	adults seen but no eggs observed	6-May-99
Gray Treefrog Complex	adults seen/heard but no eggs observed	6-May-99
Western Chorus Frog	adults seen/heard but no eggs observed	6-May-99
Rana sp.	adults seen but no eggs observed	6-May-99
Eastern Garter Snake	adults seen but no eggs observed	6-May-99
Southern Leopard Frog	adults seen but no eggs observed	6-May-99
Spring Peeper	eggs and/or larvae observed	1-Jun-99
Gray Treefrog Complex	eggs and/or larvae observed	1-Jun-99
Gray Treefrog Complex	adults heard but no eggs observed	1-Jun-99
Western Chorus Frog	eggs and/or larvae observed	1-Jun-99
Western Chorus Frog	metamorphs observed leaving pond	1-Jun-99
Southern Leopard Frog	eggs and/or larvae observed	1-Jun-99
Southern Leopard Frog	metamorphs observed leaving pond	1-Jun-99
Southern Leopard Frog	adults seen but no eggs observed	1-Jun-99
Rana sp.	adults seen but no eggs observed	1-Jun-99
Cricket Frog	adults seen but no eggs observed	1-Jun-99
Gray Treefrog Complex	adults heard but no eggs observed	23-Jun-99
Cricket Frog	adults seen but no eggs observed	23-Jun-99
Southern Leopard Frog	metamorphs observed leaving pond	23-Jun-99
Western Chorus Frog	metamorphs observed leaving pond	23-Jun-99
Spring Peeper	metamorphs observed leaving pond	23-Jun-99
Western Chorus Frog	adults heard but no eggs observed	3-Mar-00

Spring Peeper	adults heard but no eggs observed	3-Mar-00
Pseudacris sp.	eggs and/or larvae observed	3-Mar-00
Spotted Salamander	eggs and/or larvae observed	4-Mar-00
Western Chorus Frog	eggs and/or larvae observed	4-Mar-00
Marbled Salamander	eggs and/or larvae observed	4-Mar-00
Western Chorus Frog	adults seen and eggs observed	4-Mar-00
Eastern Box Turtle	adults seen but no eggs observed	4-Mar-00
Spotted Salamander	adults seen but no eggs observed	14-Mar-00
Western Chorus Frog	eggs and/or larvae observed	14-Mar-00
Cricket Frog	adults seen but no eggs observed	18-May-00
Southern Leopard Frog	adults seen but no eggs observed	18-May-00
Rana sp.	adults seen but no eggs observed	18-May-00
Eastern Garter Snake	adults seen but no eggs observed	18-May-00
Gray Treefrog Complex	adults heard but no eggs observed	18-May-00
Marbled Salamander	metamorphs observed leaving pond	18-May-00
Western Chorus Frog	metamorphs observed leaving pond	18-May-00
Fowler's Toad	metamorphs observed leaving pond	13-Jun-00
Southern Leopard Frog	adults seen but no eggs observed	13-Jun-00
Southern Leopard Frog	metamorphs observed leaving pond	13-Jun-00
Rana sp.	adults seen but no eggs observed	13-Jun-00
Fowler's Toad	adults seen but no eggs observed	13-Jun-00
Cricket Frog	adults seen but no eggs observed	13-Jun-00
Gray Treefrog Complex	metamorphs observed leaving pond	20-Jul-00
Southern Leopard Frog	adults seen but no eggs observed	20-Jul-00
Rana sp.	adults seen but no eggs observed	20-Jul-00
Green Frog	adults seen/heard but no eggs observed	20-Jul-00
Fowler's Toad	adults seen but no eggs observed	20-Jul-00
Western Chorus Frog	metamorphs observed leaving pond	20-Jul-00
Southern Leopard Frog	metamorphs observed leaving pond	20-Jul-00
Eastern Box Turtle	adults seen but no eggs observed	20-Jul-00
Fowler's Toad	metamorphs observed leaving pond	20-Jul-00
Spotted Salamander	eggs and/or larvae observed	1-Mar-01
Marbled Salamander	eggs and/or larvae observed	1-Mar-01
Tiger Salamander	eggs and/or larvae observed	1-Mar-01
Cricket Frog	adults seen but no eggs observed	26-Apr-01
Southern Leopard Frog	adults seen but no eggs observed	26-Apr-01
Rana sp.	adults seen but no eggs observed	26-Apr-01
Marbled Salamander	eggs and/or larvae observed	26-Apr-01
Spotted Salamander	eggs and/or larvae observed	26-Apr-01
Marbled Salamander	eggs and/or larvae observed	14-Mar-03
Southern Leopard Frog	adults seen but no eggs observed	14-Mar-03
Marbled Salamander	eggs and/or larvae observed	11-Apr-03
Spotted Salamander	eggs and/or larvae observed	11-Apr-03
Spring Peeper	adults seen but no eggs observed	11-Apr-03
Southern Leopard Frog	adults seen but no eggs observed	11-Apr-03
Green Frog	adults seen but no eggs observed	11-Apr-03
Marbled Salamander	eggs and/or larvae observed	16-Apr-03
Spotted Salamander	eggs and/or larvae observed	16-Apr-03

Southern Leopard Frog	adults seen/heard but no eggs observed	16-Apr-03
Spring Peeper	adults seen but no eggs observed	16-Apr-03
Eastern Box Turtle	adults seen but no eggs observed	16-Apr-03
Marbled Salamander	eggs and/or larvae observed	23-Apr-03
Spotted Salamander	eggs and/or larvae observed	23-Apr-03
Southern Leopard Frog	adults seen but no eggs observed	23-Apr-03
Marbled Salamander	eggs and/or larvae observed	2-May-03
Spotted Salamander	eggs and/or larvae observed	2-May-03
Marbled Salamander	eggs and/or larvae observed	7-May-03
Spotted Salamander	eggs and/or larvae observed	7-May-03
Rana sp.	adults seen but no eggs observed	7-May-03
Marbled Salamander	eggs and/or larvae observed	14-May-03
Spotted Salamander	eggs and/or larvae observed	14-May-03
Southern Leopard Frog	adults seen but no eggs observed	14-May-03
Fowler's Toad	adults seen but no eggs observed	14-May-03
Marbled Salamander	eggs and/or larvae observed	21-May-03
Spotted Salamander	eggs and/or larvae observed	21-May-03
Southern Leopard Frog	adults seen but no eggs observed	21-May-03
Marbled Salamander	eggs and/or larvae observed	28-May-03
Spotted Salamander	eggs and/or larvae observed	28-May-03
Southern Leopard Frog	adults seen but no eggs observed	28-May-03
Marbled Salamander	eggs and/or larvae observed	4-Jun-03
Spring Peeper	eggs and/or larvae observed	4-Jun-03
Spotted Salamander	eggs and/or larvae observed	4-Jun-03
Southern Leopard Frog	metamorphs observed leaving pond	4-Jun-03
Marbled Salamander	eggs and/or larvae observed	11-Jun-03
Spotted Salamander	eggs and/or larvae observed	11-Jun-03
Gray Treefrog Complex	adults heard but no eggs observed	11-Jun-03
Southern Leopard Frog	metamorphs observed leaving pond	18-Jun-03
Southern Leopard Frog	adults seen but no eggs observed	18-Jun-03
Gray Treefrog Complex	adults heard but no eggs observed	18-Jun-03
Eastern Box Turtle	adults seen but no eggs observed	18-Jun-03

Table 3. Amphibians and Reptiles Observed in Pond 2

Species	Reproductive Status	Date
Fowler's Toad	adults seen but no eggs observed	20-Apr-99
Cricket Frog	adults seen but no eggs observed	20-Apr-99
Western Chorus Frog	adults heard but no eggs observed	20-Apr-99
Southern Leopard Frog	adults seen but no eggs observed	20-Apr-99
Rana sp.	adults seen but no eggs observed	20-Apr-99
Southern Leopard Frog	adults seen but no eggs observed	6-May-99
Western Chorus Frog	eggs and/or larvae observed	6-May-99
Western Chorus Frog	metamorphs observed leaving pond	1-Jun-99
Rana sp.	adults seen but no eggs observed	1-Jun-00
Eastern Box Turtle	adults seen but no eggs observed	1-Jun-00
Broadhead Skink	adults seen but no eggs observed	1-Jun-00
Broadhead Skink	eggs and/or larvae observed	1-Jun-00

Western Chorus Frog	metamorphs observed leaving pond	23-Jun-00
Southern Leopard Frog	metamorphs observed leaving pond	23-Jun-00
Spotted Salamander	eggs and/or larvae observed	4-Mar-00
Marbled Salamander	eggs and/or larvae observed	4-Mar-00
Southern Leopard Frog	adults seen but no eggs observed	14-Mar-00
Spotted Salamander	eggs and/or larvae observed	14-Mar-00
Fowler's Toad	adults seen but no eggs observed	18-May-00
Eastern Box Turtle	adults seen but no eggs observed	18-May-00
Southern Leopard Frog	adults seen but no eggs observed	18-May-00
Rana sp.	adults seen but no eggs observed	18-May-00
Gray Treefrog Complex	adults heard but no eggs observed	18-May-00
Fowler's Toad	metamorphs observed leaving pond	13-Jun-00
Fowler's Toad	metamorphs observed leaving pond	20-Jul-00
Gray Treefrog Complex	metamorphs observed leaving pond	20-Jul-00
Green Frog	adults seen but no eggs observed	20-Jul-00
Rana sp.	adults seen but no eggs observed	20-Jul-00
Gray Treefrog Complex	eggs and/or larvae observed	20-Jul-00
Western Chorus Frog	metamorphs observed leaving pond	20-Jul-00
Spotted Salamander	eggs and/or larvae observed	1-Mar-01
Marbled Salamander	eggs and/or larvae observed	1-Mar-01
Southern Leopard Frog	adults seen but no eggs observed	1-Mar-01
Spotted Salamander	eggs and/or larvae observed	26-Apr-01
Spring Peeper	adults seen but no eggs observed	26-Apr-01
Rana sp.	adults seen but no eggs observed	26-Apr-01
unidentified Hylids	adults seen but no eggs observed	26-Apr-01
Marbled Salamander	eggs and/or larvae observed	26-Apr-01
Cricket Frog	adults seen but no eggs observed	26-Apr-01
Marbled Salamander	eggs and/or larvae observed	14-Mar-03
Eastern Box Turtle	adults seen but no eggs observed	14-Mar-03
Marbled Salamander	eggs and/or larvae observed	11-Apr-03
Spotted Salamander	eggs and/or larvae observed	11-Apr-03
Fowler's Toad	eggs and/or larvae observed	11-Apr-03
Rana sp.	eggs and/or larvae observed	11-Apr-03
Green Frog	adults seen but no eggs observed	11-Apr-03
Southern Leopard Frog	adults seen but no eggs observed	11-Apr-03
Marbled Salamander	eggs and/or larvae observed	16-Apr-03
Spotted Salamander	eggs and/or larvae observed	16-Apr-03
Marbled Salamander	eggs and/or larvae observed	23-Apr-03
Spotted Salamander	eggs and/or larvae observed	23-Apr-03
Southern Leopard Frog	adults seen but no eggs observed	23-Apr-03
Spring Peeper	adults seen but no eggs observed	23-Apr-03
Marbled Salamander	eggs and/or larvae observed	2-May-03
Spotted Salamander	eggs and/or larvae observed	2-May-03
Marbled Salamander	eggs and/or larvae observed	7-May-03
Gray Treefrog Complex	adults heard but no eggs observed	7-May-03
Marbled Salamander	eggs and/or larvae observed	14-May-03
Marbled Salamander	eggs and/or larvae observed	21-May-03
Fowler's Toad	adults heard but no eggs observed	28-May-03

Eumeces sp.	adults seen but no eggs observed	28-May-03
Eumeces sp.	adults seen but no eggs observed	4-Jun-03
Gray Treefrog Complex	adults heard but no eggs observed	11-Jun-03
Southern Leopard Frog	metamorphs observed leaving pond	18-Jun-03
Southern Leopard Frog	adults seen but no eggs observed	18-Jun-03

Throughout the study period, most amphibians expected to occur at the Perry County Mitigation Site have utilized this location at some point. Two notable exceptions are the American toad (*Bufo americanus*) and the smallmouth salamander (*Ambystoma texanum*). While the smallmouth salamander has not been documented in relation to the site, the American toad has been observed to the west of the forest containing the study ponds. Within time, it is likely that these and other previously unobserved species will colonize and exploit the Perry County Mitigation Site.

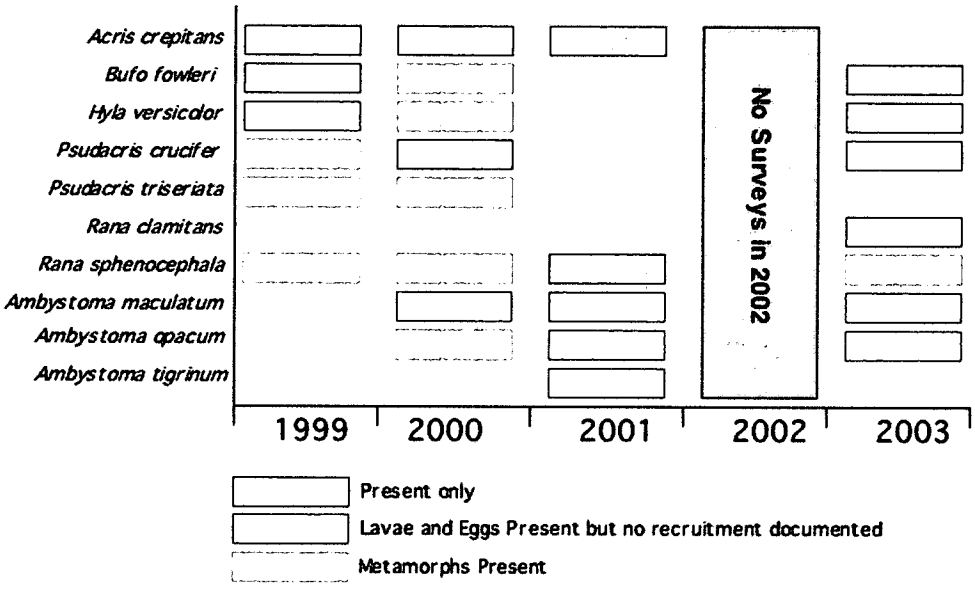

Fig. 2. Chronological order of colonization and recruitment of Pond 1 by amphibians

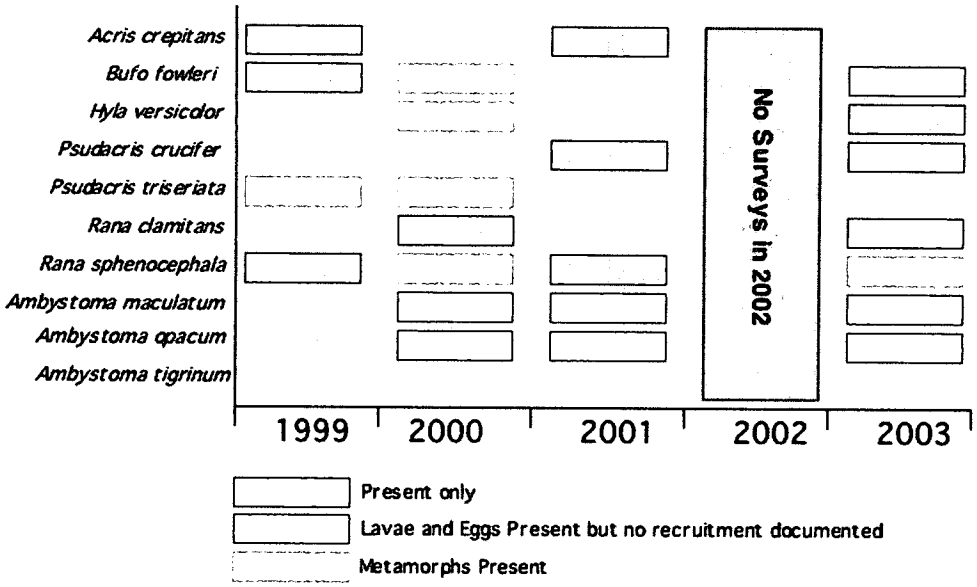

Fig. 3. Chronological order of colonization and recruitment of Pond 2 by amphibians

LITERATURE CITED

Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Foster eds. 1994. Measuring and monitoring biological diversity: Standard methods for amphibians. Smithsonian Institution Press, Washington. 364 pp.

Levin, G.A., L. Suloway, A.E. Plocher, F.R. Hutto, J.J. Miner, C.A. Phillips, J. Agarwal, Y. Lin. 2002. Status and functions of isolated wetlands in Illinois. Illinois Natural History Survey, Champaign. 16 pp.