**Final Report**
**State Wildlife Grant T-10-P**

# Habitat Enhancement, Monitoring, and Management for Conservation Priority Species

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**Grant Objectives:**

- Monitor the distribution and status of selected species of conservation concern
- Implement and evaluate habitat management practices for selected species of conservation concern
- Implement and evaluate strategies for recovery of state endangered and threatened species

**Performance:**

**Study 1**: Monitor the distribution and status of selected species of conservation concern.

**Job 1.1**: Monitor reptiles and amphibians on state and federal properties.

**Objective**: Conduct surveys for the presence of reptiles and amphibians at $\geq$10 sites per fiscal year.

**Results**: We sampled 47 sites in 30 counties (Appendix I) and collected 282 records of occurrence for 33 species of reptiles and amphibians (Appendix II). Our efforts produced 51 new county records, 21 of which were duplicates (i.e., we encountered the species at >1 location or during >1 sampling season in the same county).

Targeted sampling for chelonians resulted in the capture of 2,729 turtles during 829 net-nights. Species composition included slider (*Trachemys scripta*; $n$ = 1,776), common snapping (*Chelydra serpentina*; $n$ = 341), painted (*Chrysemys picta*; $n$ = 293), spiny softshell (*Apalone spinifera*; $n$ = 247), smooth softshell (*Apalone mutica*; $n$ = 36), common musk (*Sternotherus odoratus*; $n$ = 14), false map (*Graptemys pseudogeographica*; $n$ = 14), and Ouachita map (*Graptemys ouachitensis*; $n$ = 8) turtles.

Targeted sampling at Cypress Pond State Natural Area (CPSNA) occurred on 10 occasions from 26 August 2007 through 19 November 2007 using a variety of methods (visual encounter surveys, seining, and funnel traps). We encountered 23 species of reptiles and amphibians at CPSNA and 3 additional species on adjoining properties (Appendix III).

**Evaluation**: Sampling constraints required expanding our efforts to include county and municipal properties. Grant objectives were exceeded with this modification. We encountered about a third of the 102 species of reptiles and amphibians thought to occur in Illinois. Nearly all of these were species that are considered to be common. Nevertheless, our efforts produced a number of new county records. These data were provided to Dr. Chris Phillips, Illinois Natural History Survey, for eventual publication.

Sampling provided one record for a threatened species (*Emydoidea blandingii*) and several for the smooth softshell turtle (*Apalone mutica*), which is listed as a Species in Greatest Need of Conservation. Our data suggest that the smooth softshell might be more common than previously thought.

**Job 1.2**: Monitor non-game birds

**Objectives**: Coordinate data collection from ≥75 BBS routes annually.

**Results**: The route coordinator contacted >90 volunteers each year to request assistance with BBS routes. More routes were completed in 2005 (93) than 2006 (83) or 2007 (80). Detailed records of numbers of species and individuals observed per year are available from USGS (http://www.pwrc.usgs.gov/bbs).

**Evaluation**: Grant objectives were exceeded.

**Job 1.3**: Data analysis and reporting

**Objectives**: To summarize and submit an annual report of accomplishments for jobs 1.1 and 1.2.

**Results**: Annual reports were submitted for the first and second segments of the project; a final report including progress during segment 3 was submitted to USFWS. A brief report of accomplishments for Job 1.1 was prepared and distributed to field staff and administrators in DNR. We anticipate that some of the data collected for Job 1.1 will be published in one or more articles in peer-reviewed scientific journals.

**Evaluation**: Grant objectives were met.

**Study 2**: Implement and evaluate habitat management practices for selected species of conservation concern.

**Job 2.1**: Construct and evaluate use of artificial (man-made) hibernacula.

**Objective**: Construct ≥4 hibernacula per fiscal year and determine their use by snakes.

**Results:** Hibernacula are important to snakes as refugia from harsh winter weather conditions. Snake use of natural hibernacula has received much attention in the wildlife literature (Parker and Brown 1973, Burger et al. 1988, Prior and Weatherhead 1996). Relatively less research has been conducted on snake use of man-made hibernacula (Gillingham and Carpenter 1978); such alterations of otherwise unsuitable landscapes may provide much needed habitat for snakes during winter.

Twenty-two snake species currently exist in southern Illinois, however little is known about their wintering habits and hibernacula preferences (Phillips 2005). Natural hibernation sites include rock crevices, communal dens, and rodent and crayfish burrows (Phillips 2005). Our goal was to construct man-made hibernacula on a wildlife refuge in southern Illinois during 2006-08 and monitor use of hibernacula by snakes and other wildlife.

*Hibernacula Design, Construction, and Placement*

We conducted research at the Crab Orchard National Wildlife Refuge in Williamson County, Illinois. Hibernacula were placed near walking trails off Spillway Road. Hibernacula of 2 different designs were constructed and placed afield during 2006-07. Four large, pit-type hibernacula constructed of natural material were implemented during February-March 2006. Each hiberaculum was placed in a different habitat type: swamp/wetland, prairie, rocky bluff, and woodland, with an emphasis on minimum environmental impact and natural quality. Large holes measuring 3 × 6 m were dug 2 m into the ground with a backhoe. Logs, stumps, branches, and large rocks were gathered from the surrounding area and placed in each hole. Soil and vegetation removed was then placed on top of each unit to minimize disturbance to the area.

Eight box -type hibernacula were implemented during October-December 2007. These hibernacula were much smaller in size, constructed of plywood, and had a small door for monitoring access. Hibernacula were 1 × 1 × 1 m in size, and lined and covered in plastic for additional thermal benefit. Locations for placement were in hillsides in varied habitats as aforementioned, and embedded 90% in-ground to allow for monitoring.

*Hibernacula Monitoring*

Monitoring of the 4 pit-type hibernacula occurred during August 2006-March 2007; visual searches for snake and wildlife use were conducted once weekly. During January-February 2007, we also attempted to use a burrow probe remote camera system (Fuhrman Diversified, Seabrook, TX; VerCauteren et al. 2002, White et al. 2007) to quantify snake use within the 4 pit-type hibernacula. These hibernacula and the 8 box-type units were further monitored during December 2007-February 2008.

At the beginning of each search, we collected air temperature readings, humidity, and wind speed using a Kestrel 2000 wind meter. Substrate temperatures were also quantified using a using a probe thermometer, and percentage cloud cover and rainfall was recorded. At each pit-type hibernaculum, we searched <4 m and <100 m of each opening; we opened the front door to search each box-type hibernaculum. All reptile, amphibian, and small mammal species detected during visual searches were noted. For snake species, we recorded life stage and sex when possible.

During 2006-07 monitoring, we located 13 species of reptiles and amphibians associated with the 4 hibernacula (Table 1). Although we did not locate any small mammal species during searches, their presence at the sites would represent an important food source for some local snake species. Site 2 had a large abundance of amphibian species in direct proximity to the hibernacula, with many small lizards present along the drier bluffline at the edge of Devil's Kitchen Lake. At Site 1 we found more lizards and snake species dispersed randomly in the 100-m search area around the site, and we found only 1 species of interest at this hibernaculum. Only 1 snake species was recorded at Site 3. We were forced to discontinue searches at Site 4 due to flooding in November, and did not record any species of interest. Searches using the burrow probe were generally unsuccessful due

to difficulty in burrow probe placement into hibernacula, thus we discontinued this monitoring technique. We found no snake or other wildlife use of hibernacula during 2007-08 monitoring; due to lack of snake use, we were unable to correlate weather conditions or temperatures to snake presence.

*Discussion*

We documented little use of man-made hibernacula by snakes. In certain instances, hibernacula were placed in areas lacking potential natural hibernacula habitat (e.g., rock outcroppings and crevices). However, much of the study area contains likely natural hibernacula sites for snakes that have received traditional use. Snakes often use traditional communal hibernacula, which may require years and multiple generations of related animals to establish via migration patterns (Gregory 1984, Sexton et al. 1992); this is why snakes are often experimentally placed in artificial hibernacula for study (Gillingham and Carpenter 1978). The short-term nature of this study and lack of introduction of wild-captured snakes into hibernacula thus somewhat limited our ability to definitively confirm the utility of man-made hibernacula for snakes.

Gillingham and Carpenter (1978) created an elaborate observation chamber to assess use of a man-made hibernaculum by 23 snakes placed experimentally in the hibernaculum. We were unable to utilize such a study design due to logistical restraints. Gillingham and Carpeter (1978) were able to document snake mortality, winter activity, and behavior of snakes. They concluded that their hibernacula design was easy to use and provided a viable alternative to disturbing natural hibernacula settings.

Regardless, we believe the hibernacula designs we developed may produce benefits to snakes and other wildlife species over time. The initial 4, large, pit-type hibernacula clearly provide considerable refugia for wildlife, but must be placed in upland areas to minimize flooding. This is often difficult, as Gillingham and Carpenter (1978) needed to use an electric sump pump to keep their man-made hibernaculum dry. Our pit-type hibernacula required considerably more effort to dig and construct than box-type hibernacula. The pit-type hibernacula were more "natural", thus may be more attractive to snakes. However, without an elaborate observation chamber (Gillingham and Carpenter 1978), they remain difficult to monitor. We had hoped the use of a burrow probe camera (VerCauteren et al. 2002, White et al. 2007) would facilitate monitoring, however, this would require greater consideration of how to place the burrow probe into the submerged hibernacula. PVC piping could be placed through the roof of hibernacula, but would need to be capped to not decrease the thermal quality inside. The box-type hibernacula were less expensive (i.e., not requiring a backhoe) and easier to construct and implement in the field. However, they were less natural and considerably smaller than pit-type hibernacula.

In conclusion, although we documented scant use of hibernacula by snakes, we believe these systems may be useful for snakes over long periods of time, especially for wildlife managers on short budgets. However, we suggest longer studies and the use of

radiotelemetry (Jacob and Painter 1980, Weatherhead 1989) to more definitively assess utility of man-made hibernacula for snakes.

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Table 1. Species richness data for animals using hibernacula and near hibernacula, Crab Orchard National Wildlife Refuge, Williamson County, Illinois, 2006-07.

| Species | Common Name | Site* |
|---|---|---|
| Hyla versicolor | gray tree frog | 2 os |
| Acris crepitans | cricket frog | 2 os |
| Plethodon glutinosis | slimy salamander | 1 sa |
| Coluber constrictor | racer | 1 sa |
| Bufo fowleri | fowler's toad | 2 os |
| Nirodea sipedon | northern watersnake | 3 sa |
| Scincella lateralis | five-lined skink | 1 sa |
| Eumeces fasciatus | ground skink | 1 sa |
| Agkistrodon contortrix | copperhead | 1 sa |
| Diadophis punctatus | ringneck snake | 1 sa |
| Hyla cinerea | green treefrog | 1 sa |
| Sceloporus undulates | fence lizard | 2 sa |
| Scincella lateralis | five-lined skink | 2 sa |

*os= on site (within 4 m of hibernacula)

*sa= found in search area (100-m radius)

**Evaluation**: Objectives were met with construction of 12 hibernacula. Continued monitoring is needed to determine if use of structures increases with time.

**Job 2.2**: Construct and evaluate use of ephemeral wetlands.

**Objective**: Construct ≥20 ephemeral wetlands per fiscal year and evaluate their use by reptiles and amphibians.

**Results**: We constructed 203 ephemeral wetlands at Crawford County Conservation Area (39), Ramsey Lake State Park (33), Red Hills State Park (21), Prairie Ridge State Natural Area (CIPS Tract – 22; Fuson Tract – 9; Hunt Farm – 6; Newlin Tract – 4), Wildcat Hollow State Habitat Area (39), Sam Parr State Park (22), Lincoln Trail State Park (3), and Vermilion County Forest Preserve (5). Projects were inspected to insure compliance with specifications for construction and monitored periodically to determine use by reptiles and amphibians. Common species were found using the wetlands within one year after construction.

**Evaluation**: Most of the projects were located in Illinois' Southern Till Plain. Soils in this area are largely alfasols with high clay content. These characteristics allowed us to construct ephemeral wetlands at low costs and exceed the grant objective by more than threefold.

**Job 2.3**: Construct and evaluate use of nest platforms by ospreys.

**Objective**: Construct ≥5 nest platforms per fiscal year and evaluate their use by ospreys.

**Results**: Six nesting platforms were erected during 2005, two on each of the following lakes: Newton Lake in Jasper County, Carlyle Lake in Fayette County and Rend Lake in Franklin County. No platforms were erected during 2006 or 2007 because high-water conditions prevented placement in appropriate habitats. During 2006 and 2007, staff examined platforms that had been erected; no nests were observed.

**Evaluation**: Grant objectives were not met because of poor conditions for erecting platforms in appropriate habitats. We anticipate that metal nesting structures fabricated but not erected during this project will be placed when suitable conditions prevail.

**Job 2.4**: Data analyses and reporting

**Objective**: To prepare and submit an annual report of accomplishments for Jobs 2.1-2.3.

**Results**: Annual reports were submitted for the first and second segments of the project; a final report including progress during segment 3 was submitted to USFWS.

**Evaluation**: The grant objective was met.

**Study 3**. Implement and evaluate strategies for recovery of state endangered and threatened species.

**Job 3.1**: Evaluate release of captive-raised barn owls to establish local populations.

**Objective**: Release ≥8 captive barn owls in suitable habitat and monitor their survival.

**Results**: During 2005, 10 barn owls were raised and released on properties managed by DuPage County Forest Preserve District. Six dispersed out of telemetry range within 12 weeks after their release. Four remained in the area, using forest preserve properties in Kane, Cook, and DuPage counties for foraging and roosting. Unfortunately, all 4 birds died in December 2005, probably because they were unable to forage effectively after a winter storm with below-freezing temperatures and a relatively large accumulation of snow (8-10 inches) within a 24-hour period.

During 2006, 11 owls were released at three sites in DuPage County (Pratt's Wayne, Springbrook Prairie and Green Valley) and two sites in McHenry County (Glacial Park and Pleasant Valley). No mortalities were documented before radio contact was lost.

**Evaluation**: The grant objective was exceeded. Most owls survived 30-60 days before radio contact was lost. Their fates afterward remain unknown, providing an ambiguous result. Coordinators recognized this problem and fitted 2 owls with satellite transmitters during 2007. One dispersed to Missouri, where it died. The other migrated to the Gulf Coast (Texas and Louisiana), where it remained alive as of February 2008. Additional research is needed before this technique (release of captive-raised barn owls) can be labeled as a success or failure.

**Job 3.2**: Evaluate and apply methods to establish nesting colonies of Common, Forster's, Caspian and Least terns.

**Objective**: Monitor demographics of the Grass Lake population of Forster's tern and, during the 3-year project, attempt to establish ≥1 additional breeding colony of Forster's, Common, Caspian, or Least terns by applying methods found successful at Grass Lake.

**Results**: At Lake Elizabeth, the first Forster's Tern was observed on 19 April, 2006; two pairs were observed in the area where the decoys were placed; no nesting attempts were made on the mats or in the nesting platforms. The platforms however, were utilized by pairs (n=4) of the congener Black tern (*Chlidonias niger*) nearby in 2005, supporting the validity of their use as suitable nesting structures. There were no recorded sightings of Forster's Terns at Lake Elizabeth in 2007.

The first Forster's Terns at Grass Lake were first observed on 24 April 2006. The greatest number of Forster's at Grass Lake at one time was 58. The following year, Forster's Terns were first observed on 15 April 2007. The total number of adult Forster's in 2007 was 36.

Six Forster's Terns were observed foraging in Fourth Lake on 17 April 2006. The number increased to 20 in the latter part of June (this coincided with the timing of nest desertions by the Forster's at Grass Lake). In 2007 two Forster's Terns were observed foraging in Fourth Lake on 4 May 2007; that was the only recorded observation on Fourth Lake for that year.

No Forster's Terns sightings were recorded at Redwing Slough during the entirety of the nesting seasons in 2006 and 2007.

Attempts to establish a Least Tern colony at the Newton site failed. Concerns over possible conflicts between the plant's operations and a federally endangered species lead plant management to deny access. Alternative sites meeting our criteria were not identified before the start of the 2006 breeding season. There were no recorded sightings of Least Terns at the alternate site on the Mississippi in 2007.

Appendix IV provides detailed methods, results, and implications of this study.

**Evaluation**: The grant objective was met.

**Job 3.3**: Data analysis and reporting.

**Objective**: To prepare and submit an annual report of accomplishments for Jobs 3.1 and 3.2.

**Results**: Annual reports were submitted for the first and second segments of the project; a final report including progress during segment 3 was submitted to USFWS.

**Evaluation**: The grant objective was met.

Appendix I. Sites sampled for the presence of turtles in Illinois, 2005-2007.

| County | Site |
|---|---|
| Public waters | |
| Alexander/Pike | Mississippi River |
| Clark | Wabash River |
| Cumberland | Embarras River |
| Menard/Champaign | Sangamon River |
| Union/Jackson | Big Muddy River |
| State/federal properties | |
| Alexander | Horseshoe Lake CA |
| Alexander | Cypress Creek NWR |
| Cass | Jim Edgar Panther Creek SFWA |
| Cass | Sanganois CA |
| Christian | Sangchris Lake SP |
| Fayette | Carlyle Lake FWA |
| Franklin | Wayne Fitzgerrell SP |
| Jefferson | Ten Mile Creek SFWA |
| Jefferson | Mt. Vernon Game Farm |
| Kendall | Silver Springs SFWA |
| Lake | Chain O' Lakes SP |
| Massac | Mermet Lake CA |
| Menard | Lincoln's New Salem HS |
| Moultrie | Shelbyville SFWMA |
| Pope | Dixon Springs Agricultural Experiment Stn. |
| Pulaski | Cache River SNA |
| Randolph | Kaskaskia River FWA |
| Sangamon | Illinois State Fairgrounds |
| Sangamon | Sangamon County CA |
| St. Clair | Peabody River King SFWA |
| Union | Shawnee National Forest (LaRue Swamp) |
| Union | Union County CA |
| Will | Des Plaines Game Propagation Center |
| County/municipal properties | |
| Bond | Governor Bond Lake |
| Champaign | Lonetree Creek Forest Preserve |
| Champaign | River Bend Forest Preserve |
| Champaign | Stidham Forest Preserve |
| Kane | Nelson Lake Marsh/Dick Young Forest Preserve |
| Montgomery | Glenn Shoals Lake |
| Montgomery | Old Hillsboro Lake |
| Private properties | |
| Coles | Cassel Creek |
| Cumberland | Spears Pits |
| Iroquois | Lizzio |
| Iroquois | Beaver Creek |
| Macoupin | Bullard Lake |

Appendix II. Reptile and amphibian records for Illinois, 2005-2007.

| Scientific name | Date | County | Location | | Last record |
|---|---|---|---|---|---|
| Salamanders | | | | | |
| Ambystoma texanum | 04/02/06 | Mason | N40.06833 | W090.2675 | before 80 |
| Ambystoma texanum | 04/03/06 | Menard | N39.94613 | W089.71796 | new |
| Ambystoma texanum | 04/16/06 | Menard | N39.96119 | W089.75310 | new (dup 06) |
| Ambystoma tigrinum | 10/21/05 | Menard | T18NR6W | Section 29 | before 80 |
| Snakes | | | | | |
| Agkistrodon contortrix | 07/26/06 | Jersey | N38.99442 | W090.44163 | after 80 |
| Coluber constrictor | 06/25/05 | Sangamon | T15NR5W | Section 32 | before 80 |
| Elaphe obsoleta | 09/25/06 | Cass | N40.05405 | W090.12465 | after 80 |
| Elaphe obsoleta | 08/01/06 | | N39.04493 | W090.01294 | after 80 |
| Elaphe obsoleta | 04/23/07 | Pope | N37.29058 | W088.54673 | after 80 |
| Elaphe obsoleta | 10/30/06 | Cass | N40.02511 | W090.09809 | after 80 |
| Elaphe obsoleta | 04/18/06 | Menard | N39.96523 | W089.74669 | before 80 |
| Elaphe obsoleta | 09/09/05 | Jefferson | T3S-R3E | Section 29 | before 80 |
| Elaphe obsoleta | 08/14/06 | Montgomery | N39.13831 | W089.59226 | before 80 |
| Elaphe obsoleta | 05/12/07 | Menard | N39.95567 | W089.72781 | before 80 |
| Elaphe vulpina | 06/16/06 | Kendall | N41.62678 | W088.51835 | before 80 |
| Elaphe vulpina | 09/25/06 | Mason | N40.09135 | W090.26981 | before 80 |
| Elaphe vulpina | 04/16/06 | Menard | N39.97647 | W089.83994 | new |
| Lampropeltis calligaster | 08/23/07 | Sangamon | N39.84811 | W089.64503 | after 80 |
| Lampropeltis calligaster | 09/11/05 | Menard | N39.96869 | W089.83051 | before 80 |
| Lampropeltis calligaster | 06/03/05 | Menard | N39.95654 | W089.72787 | before 80 |
| Lampropeltis calligaster | 05/10/07 | Menard | N39.97314 | W089.84016 | before 80 |
| Nerodia erythrogaster | 04/25/06 | Massac | N37.26177 | W088.85637 | after 80 |
| Nerodia sipedon | 08/10/05 | Christian | N39.60944 | W089.44547 | after 80 |
| Nerodia sipedon | 04/24/06 | Massac | N37.25566 | W088.84977 | after 80 |
| Nerodia sipedon | 08/14/07 | Bond | N38.96048 | W089.35941 | before 80 |
| Nerodia sipedon | 07/11/05 | Mason | N40.06983 | W090.27303 | before 80 |
| Nerodia sipedon | 09/11/05 | Menard | N39.97267 | W089.83479 | before 80 |
| Nerodia sipedon | 05/18/07 | Menard | N40.07398 | W089.82882 | before 80 |
| Opheodrys aestivus | 09/10/06 | Cumberland | N39.31503 | W088.32053 | before 80 |
| Pituophis melanoleucus | 09/25/06 | Cass | N40.05299 | W090.11549 | after 80 |
| Storeria dekayi | 04/15/06 | Menard | N39.97158 | W089.83863 | new |
| Thamnophis sirtalis | 09/03/05 | Menard | N39.95586 | W089.72768 | before 80 |
| Thamnophis sirtalis | 04/19/05 | Cass | N39.95883 | W090.05409 | before 80 |
| Turtles | | | | | |
| Apalone mutica | 07/11/07 | Pike | N39.54161 | W091.09631 | after 80 |
| Apalone mutica | 06/06/06 | Jackson | N37.65578 | W089.42117 | before 80 |
| Apalone mutica | 07/05/07 | Cumberland | N39.59556 | W088.29861 | before 80 |
| Apalone mutica | 08/23/06 | Menard | N39.93811 | W089.76231 | new |
| Apalone mutica | 05/10/07 | Menard | N40.00649 | W089.84251 | new (dup 06) |
| Apalone mutica | 05/18/07 | Menard | N40.06203 | W089.83056 | new (dup 06) |
| Apalone spinifera | 05/16/06 | Alexander | N37.23098 | W089.26173 | after 80 |
| Apalone spinifera | 06/02/07 | Will | N41.331198 | W088.185652 | after 80 |

Appendix II. Reptile and amphibian records for Illinois, 2005-2007.

| Scientific name | Date | County | Location | | Last record |
|---|---|---|---|---|---|
| Turtles | | | | | |
| Apalone spinifera | 05/31/07 | Cass | N40.06575 | W090.26662 | after 80 |
| Apalone spinifera | 07/12/05 | Mason | N40.06635 | W090.26026 | after 80 |
| Apalone spinifera | 08/25/05 | Alexander | N37.11929 | W089.33195 | after 80 |
| Apalone spinifera | 05/16/06 | Alexander | N37.09374 | W089.23901 | after 80 |
| Apalone spinifera | 07/11/07 | Coles | N39.48687 | W088.21008 | after 80 |
| Apalone spinifera | 07/10/06 | Kendall | N41.645433 | W088.45028 | after 80 |
| Apalone spinifera | 08/02/06 | Fayette | N38.82015 | W089.21204 | after 80 |
| Apalone spinifera | 06/14/06 | Macoupin | N39.216316 | W090.00873 | before 80 |
| Apalone spinifera | 08/03/06 | Christian | N39.60933 | W089.44454 | before 80 |
| Apalone spinifera | 07/13/06 | Iroquois | N40.97531 | W087.61843 | before 80 |
| Apalone spinifera | 07/11/06 | Champaign | N40.37548 | W088.36697 | before 80 |
| Apalone spinifera | 07/03/07 | Cumberland | N39.35333 | W088.31444 | before 80 |
| Apalone spinifera | 07/24/07 | Champaign | N40.36861 | W088.34855 | before 80 |
| Apalone spinifera | 08/16/07 | Champaign | N40.26861 | W088.56889 | before 80 |
| Apalone spinifera | 09/26/05 | Union | N37.39608 | W089.35722 | before 80 |
| Apalone spinifera | 07/25/06 | Madison | N37.71004 | W090.06768 | before 80 |
| Apalone spinifera | 09/11/07 | Champaign | N40.18223 | W088.43448 | before 80 |
| Apalone spinifera | 06/14/06 | Macoupin | N39.20778 | W090.00137 | before 80 |
| Apalone spinifera | 07/11/06 | Iroquois | N40.67697 | W088.01052 | before 80 |
| Apalone spinifera | 06/06/06 | Union | N37.5614 | W089.47692 | before 80 |
| Apalone spinifera | 06/14/06 | Macoupin | N39.214316 | W089.96723 | before 80 |
| Apalone spinifera | 07/12/07 | Moultrie | N39.57581 | W088.52773 | before 80 |
| Apalone spinifera | 06/04/06 | Union | N37.36967 | W089.35983 | before 80 |
| Apalone spinifera | 06/08/06 | Montgomery | N39.13872 | W089.58075 | new |
| Apalone spinifera | 09/12/05 | Sangamon | N39.83997 | W089.64719 | new |
| Apalone spinifera | 09/13/07 | Jefferson | N38.24167 | W088.71237 | new |
| Apalone spinifera | 07/25/07 | Montgomery | N39.24662 | W089.45750 | new |
| Apalone spinifera | 05/20/06 | Pulaski | N37.29117 | W089.07883 | new |
| Apalone spinifera | 07/25/07 | Clark | N39.56028 | W087.68083 | new |
| Apalone spinifera | 06/01/06 | Menard | N40.02533 | W089.84053 | new |
| Apalone spinifera | 04/26/06 | Massac | N37.25100 | W088.82752 | new |
| Apalone spinifera | 08/23/06 | Menard | N39.93811 | W089.76231 | new (dup 06) |
| Apalone spinifera | 05/10/07 | Menard | N40.00649 | W089.84251 | new (dup 06) |
| Apalone spinifera | 05/18/07 | Menard | N40.06855 | W089.83062 | new (dup 06) |
| Apalone spinifera | 06/09/06 | Montgomery | N39.14463 | W089.58483 | new (dup 06) |
| Chelydra serpentina | 04/28/05 | Pope | N37.42178 | W088.65835 | after 80 |
| Chelydra serpentina | 07/11/06 | Iroquois | N40.97531 | W087.61843 | after 80 |
| Chelydra serpentina | 06/06/06 | Union | N37.5655 | W089.44055 | after 80 |
| Chelydra serpentina | 05/16/06 | Alexander | N37.09253 | W089.23843 | after 80 |
| Chelydra serpentina | 07/25/06 | Madison | N38.86136 | W090.11080 | after 80 |
| Chelydra serpentina | 06/01/07 | Will | N41.330682 | W088.184548 | after 80 |
| Chelydra serpentina | 08/24/05 | Alexander | N37.12230 | W089.31832 | after 80 |
| Chelydra serpentina | 04/24/07 | Pope | N37.28772 | W088.54112 | after 80 |

Appendix II. Reptile and amphibian records for Illinois, 2005-2007.

| Scientific name | Date | County | Location | | Last record |
|---|---|---|---|---|---|
| Turtles | | | | | |
| Chelydra serpentina | 08/28/06 | Randolph | N38.014405 | W89.961483 | after 80 |
| Chelydra serpentina | 09/27/05 | Union | N37.40670 | W089.35403 | after 80 |
| Chelydra serpentina | 05/16/07 | Kane | N41.83096 | W088.38333 | after 80 |
| Chelydra serpentina | 05/19/06 | Pulaski | N37.30767 | W089.02 | after 80 |
| Chelydra serpentina | 06/05/06 | Union | N37.36967 | W089.35983 | after 80 |
| Chelydra serpentina | 05/16/06 | Alexander | N37.23098 | W089.26173 | after 80 |
| Chelydra serpentina | 04/30/06 | Alexander | N37.30833 | W089.477 | after 80 |
| Chelydra serpentina | 06/06/06 | Jackson | N37.64311 | W089.41834 | after 80 |
| Chelydra serpentina | 05/09/06 | Alexander | N37.15767 | W089.3485 | after 80 |
| Chelydra serpentina | 07/25/06 | Madison | N37.71004 | W090.06768 | after 80 |
| Chelydra serpentina | 09/13/05 | Morgan | N39.81368 | W090.35829 | after 80 |
| Chelydra serpentina | 08/02/06 | Fayette | N38.83282 | W089.21203 | after 80 |
| Chelydra serpentina | 07/11/06 | Iroquois | N40.67369 | W088.01139 | after 80 |
| Chelydra serpentina | 08/03/06 | Christian | N39.62719 | W089.45171 | after 80 |
| Chelydra serpentina | 04/25/06 | Massac | N37.27020 | W088.85119 | before 80 |
| Chelydra serpentina | 07/11/06 | Champaign | N40.36912 | W088.33021 | before 80 |
| Chelydra serpentina | 07/25/07 | Clark | N39.53083 | W087.64750 | before 80 |
| Chelydra serpentina | 05/02/06 | Cumberland | N39.2869 | W088.27623 | before 80 |
| Chelydra serpentina | 07/11/06 | Champaign | N40.36917 | W088.38032 | before 80 |
| Chelydra serpentina | 07/19/07 | Coles | N39.50588 | W088.07285 | before 80 |
| Chelydra serpentina | 07/13/06 | Champaign | N40.37548 | W088.36697 | before 80 |
| Chelydra serpentina | 05/18/06 | Jefferson | N38.23555 | W088.8937 | before 80 |
| Chelydra serpentina | 07/24/07 | Champaign | N40.36861 | W088.34855 | before 80 |
| Chelydra serpentina | 05/10/06 | Cumberland | N39.3468 | W088.15345 | before 80 |
| Chelydra serpentina | 07/17/07 | Coles | N39.48687 | W088.21008 | before 80 |
| Chelydra serpentina | 06/21/07 | Lake | N42.55889 | W088.39639 | before 80 |
| Chelydra serpentina | 09/11/07 | Champaign | N40.18200 | W088.43488 | before 80 |
| Chelydra serpentina | 07/12/05 | Mason | N40.06571 | W090.26353 | before 80 |
| Chelydra serpentina | 07/11/07 | Pike | N39.52898 | W091.07769 | before 80 |
| Chelydra serpentina | 08/16/07 | Champaign | N40.25694 | W088.54750 | before 80 |
| Chelydra serpentina | 09/08/06 | Jefferson | N38.19922 | W088.75587 | before 80 |
| Chelydra serpentina | 04/22/05 | Cass | N39.99617 | W090.08246 | new |
| Chelydra serpentina | 06/05/07 | Franklin | N38.18944 | W089.02972 | new |
| Chelydra serpentina | 07/26/07 | Montgomery | N39.21590 | W089.55712 | new |
| Chelydra serpentina | 06/08/06 | Montgomery | N39.13872 | W089.58075 | new |
| Chelydra serpentina | 07/13/05 | Menard | N39.95584 | W089.72773 | new |
| Chelydra serpentina | 08/23/06 | Menard | N39.91391 | W089.76891 | new (dup 05 06) |
| Chelydra serpentina | 06/09/06 | Montgomery | N39.14463 | W089.58483 | new (dup 06) |
| Chelydra serpentina | 05/18/07 | Menard | N40.06855 | W089.83062 | new (dup 06) |
| Chelydra serpentina | 05/10/07 | Menard | N39.96319 | W089.79522 | new (dup 06) |
| Chelydra serpentina | 06/29/06 | Menard | N39.96824 | W089.81551 | new (dup 06) |
| Chrysemys picta | 07/11/06 | Iroquois | N40.67369 | W088.01139 | after 80 |
| Chrysemys picta | 09/13/05 | Morgan | N39.81308 | W090.37770 | after 80 |
| Chrysemys picta | 08/02/06 | Fayette | N38.83282 | W089.21203 | after 80 |

Appendix II. Reptile and amphibian records for Illinois, 2005-2007.

| Scientific name | Date | County | Location | | Last record |
|---|---|---|---|---|---|
| Turtles | | | | | |
| Chrysemys picta | 07/25/07 | Clark | N39.39250 | W087.66972 | after 80 |
| Chrysemys picta | 07/11/06 | Champaign | N40.36917 | W088.38032 | after 80 |
| Chrysemys picta | 08/23/06 | Sangamon | N39.91443 | W089.76765 | after 80 |
| Chrysemys picta | 05/16/07 | Kane | N41.83096 | W088.38333 | after 80 |
| Chrysemys picta | 08/03/06 | Christian | N39.60294 | W089.44751 | after 80 |
| Chrysemys picta | 06/14/06 | Macoupin | N39.2118 | W089.97785 | after 80 |
| Chrysemys picta | 07/25/06 | Madison | N38.86136 | W090.11080 | after 80 |
| Chrysemys picta | 04/25/07 | Pope | N37.29361 | W088.54687 | after 80 |
| Chrysemys picta | 08/22/06 | Champaign | N40.19763 | W088.3664 | after 80 |
| Chrysemys picta | 06/01/07 | Will | N41.330541 | W088.181476 | after 80 |
| Chrysemys picta | 05/19/06 | Pulaski | N37.29467 | W089.89523 | after 80 |
| Chrysemys picta | 05/09/06 | Alexander | N37.155 | W089.33967 | after 80 |
| Chrysemys picta | 07/26/05 | Sangamon | N39.83835 | W089.64787 | after 80 |
| Chrysemys picta | 05/16/06 | Alexander | N37.09917 | W089.24961 | after 80 |
| Chrysemys picta | 08/23/05 | Alexander | N37.11378 | W089.32473 | after 80 |
| Chrysemys picta | 04/19/05 | Cass | N39.95229 | W090.06485 | before 80 |
| Chrysemys picta | 07/12/05 | Mason | N40.06603 | W090.26256 | before 80 |
| Chrysemys picta | 09/14/07 | Jefferson | N38.2353 | W088.71218 | before 80 |
| Chrysemys picta | 08/16/07 | Bond | N38.95385 | W089.37427 | before 80 |
| Chrysemys picta | 07/25/07 | Montgomery | N39.26119 | W089.45158 | before 80 |
| Chrysemys picta | 06/21/07 | Lake | N42.52917 | W088.21972 | before 80 |
| Chrysemys picta | 06/13/06 | Kendall | N41.62238 | W088.52443 | before 80 |
| Chrysemys picta | 04/25/06 | Massac | N37.26798 | W088.85271 | before 80 |
| Chrysemys picta | 05/10/06 | Cumberland | N39.3468 | W088.15345 | before 80 |
| Chrysemys picta | 05/31/07 | Cass | N40.06575 | W090.26662 | before 80 |
| Chrysemys picta | 06/08/06 | Montgomery | N39.13773 | W089.59207 | before 80 |
| Chrysemys picta | 06/06/07 | Franklin | N38.35222 | W088.93639 | before 80 |
| Chrysemys picta | 04/17/07 | Peoria | N40.53931 | W089.83474 | before 80 |
| Chrysemys picta | 07/11/07 | Pike | N39.53550 | W091.08577 | before 80 |
| Chrysemys picta | 05/18/07 | Menard | N40.07377 | W089.82824 | before 80 |
| Chrysemys picta | 06/01/06 | Menard | N40.03260 | W089.83689 | new |
| Chrysemys picta | 08/10/05 | Christian | N39.61517 | W089.44624 | new |
| Chrysemys picta | 07/12/07 | Moultrie | N39.57611 | W088.54488 | new |
| Chrysemys picta | 05/11/07 | Menard | N39.98824 | W089.83468 | new (dup 06) |
| Chrysemys picta | 09/06/06 | Menard | N39.93811 | W089.78070 | new (dup 06) |
| Chrysemys picta | 06/29/06 | Menard | N39.96918 | W089.80551 | new (dup 06) |
| Emydoidea blandingii | 05/30/07 | Lake | N42.71278 | W088.28611 | after 80 |
| Graptemys ouachitensis | 06/06/06 | Jackson | N37.64311 | W089.41834 | after 80 |
| Graptemys ouachitensis | 05/31/07 | Cass | N40.06575 | W090.26662 | after 80 |
| Graptemys ouachitensis | 04/30/06 | Alexander | N37.26867 | W089.50317 | new |
| Graptemys ouachitensis | 05/31/06 | Menard | N40.02533 | W089.84053 | new |
| Graptemys ouachitensis | 05/10/07 | Menard | N39.95657 | W089.78422 | new (dup 06) |
| Graptemys pseudogeographica | 06/06/06 | Jackson | N37.63979 | W089.43626 | after 80 |
| Graptemys pseudogeographica | 04/30/06 | Alexander | N37.30833 | W089.477 | after 80 |

Appendix II. Reptile and amphibian records for Illinois, 2005-2007.

| Scientific name | Date | County | Location | | Last record |
|---|---|---|---|---|---|
| Turtles | | | | | |
| Graptemys pseudogeographica | 06/04/06 | Union | N37.36967 | W089.35983 | New |
| Graptemys pseudogeographica | 06/07/06 | Union | N37.5676 | W089.49058 | new (dup 06) |
| Graptemys pseudogeographica | 06/07/06 | Union | N37.5682 | W089.45962 | new (dup 06) |
| Sternotherus odoratus | 08/23/05 | Alexander | N37.13713 | W089.31674 | after 80 |
| Sternotherus odoratus | 04/28/05 | Pope | N37.42123 | W088.66731 | after 80 |
| Sternotherus odoratus | 05/17/06 | Alexander | N37.09374 | W089.23901 | after 80 |
| Sternotherus odoratus | 09/27/05 | Union | N37.40767 | W089.35471 | after 80 |
| Sternotherus odoratus | 06/06/06 | Union | N37.58377 | W089.4401 | after 80 |
| Sternotherus odoratus | 08/16/07 | Bond | N38.95385 | W089.37427 | before 80 |
| Sternotherus odoratus | 07/12/05 | Mason | N40.06606 | W090.26962 | before 80 |
| Sternotherus odoratus | 07/25/07 | Montgomery | N39.16665 | W089.46453 | new |
| Terrapene carolina | 09/28/05 | Union | N37.50902 | W089.32060 | after 80 |
| Terrapene carolina | 08/21/06 | Jersey | N39.04652 | W090.53962 | after 80 |
| Terrapene carolina | 07/18/06 | Coles | N39.47562 | W088.1705 | before 80 |
| Terrapene carolina | 07/27/06 | Montgomery | N39.20272 | W089.49274 | before 80 |
| Terrapene carolina | 08/14/06 | Montgomery | N39.13831 | W089.59226 | before 80 |
| Terrapene carolina | 07/26/07 | Montgomery | N39.13764 | W089.59963 | before 80 |
| Terrapene carolina | 09/12/06 | Cumberland | N39.30222 | W088.41453 | before 80 |
| Terrapene carolina | 06/05/06 | Cumberland | N39.35363 | W088.1967 | before 80 |
| Terrapene carolina | 07/18/07 | Macoupin | N39.12911 | W089.89197 | before 80 |
| Terrapene carolina | 08/21/06 | Montgomery | N39.15356 | W089.63626 | before 80 |
| Terrapene carolina | 08/22/07 | Sangamon | N39.85978 | W089.65473 | new |
| Trachemys scripta | 04/28/05 | Pope | N37.43962 | W088.65835 | after 80 |
| Trachemys scripta | 06/06/06 | Union | N37.5655 | W089.44055 | after 80 |
| Trachemys scripta | 07/25/07 | Montgomery | N39.24662 | W089.45750 | after 80 |
| Trachemys scripta | 05/16/07 | Kane | N41.83108 | W088.38269 | after 80 |
| Trachemys scripta | 07/25/06 | Madison | N38.80576 | W090.10568 | after 80 |
| Trachemys scripta | 04/24/07 | Pope | N37.40298 | W088.67230 | after 80 |
| Trachemys scripta | 07/25/07 | Clark | N39.56028 | W087.68083 | after 80 |
| Trachemys scripta | 07/25/06 | Madison | N38.86136 | W090.11080 | after 80 |
| Trachemys scripta | 06/08/06 | Montgomery | N39.13773 | W089.59207 | after 80 |
| Trachemys scripta | 07/12/05 | Mason | N40.06635 | W090.26026 | after 80 |
| Trachemys scripta | 05/19/06 | Pulaski | N37.30767 | W089.02 | after 80 |
| Trachemys scripta | 08/02/06 | Fayette | N38.83420 | W089.19226 | after 80 |
| Trachemys scripta | 08/03/06 | Christian | N39.60294 | W089.44751 | after 80 |
| Trachemys scripta | 08/24/05 | Alexander | N37.13069 | W089.36142 | after 80 |
| Trachemys scripta | 04/30/06 | Alexander | N37.30833 | W089.477 | after 80 |
| Trachemys scripta | 05/09/06 | Alexander | N37.11017 | W089.32617 | after 80 |
| Trachemys scripta | 05/31/07 | Cass | N40.06575 | W090.26662 | after 80 |
| Trachemys scripta | 06/01/07 | Will | N41.331936 | W088.1794 | after 80 |
| Trachemys scripta | 06/04/06 | Union | N37.36967 | W089.35983 | after 80 |
| Trachemys scripta | 05/19/06 | Jefferson | N38.24022 | W088.87418 | after 80 |
| Trachemys scripta | 04/24/07 | Pope | N37.28772 | W088.54112 | after 80 |
| Trachemys scripta | 05/16/06 | Alexander | N37.11776 | W089.30694 | after 80 |

Appendix II. Reptile and amphibian records for Illinois, 2005-2007.

| Scientific name | Date | County | Location | | Last record |
|---|---|---|---|---|---|
| Turtles | | | | | |
| Trachemys scripta | 09/27/05 | Union | N37.40670 | W089.35403 | after 80 |
| Trachemys scripta | 06/06/06 | Jackson | N37.63979 | W089.43626 | after 80 |
| Trachemys scripta | 08/28/07 | St Clair | N38.31944 | W089.85833 | after 80 |
| Trachemys scripta | 05/16/06 | Alexander | N37.23093 | W089.25992 | after 80 |
| Trachemys scripta | 05/16/06 | Alexander | N37.09253 | W089.23843 | after 80 |
| Trachemys scripta | 09/13/05 | Morgan | N39.81216 | W090.35836 | after 80 |
| Trachemys scripta | 07/11/07 | Pike | N39.52898 | W091.07769 | before 80 |
| Trachemys scripta | 08/23/06 | Sangamon | N39.91563 | W089.75270 | before 80 |
| Trachemys scripta | 08/28/06 | Champaign | N40.19763 | W088.3664 | before 80 |
| Trachemys scripta | 07/03/07 | Cumberland | N39.59556 | W088.29861 | before 80 |
| Trachemys scripta | 04/25/06 | Massac | N37.27020 | W088.85119 | before 80 |
| Trachemys scripta | 05/08/06 | Cumberland | N39.3468 | W088.15345 | before 80 |
| Trachemys scripta | 08/28/06 | Randolph | N38.014405 | W89.961483 | before 80 |
| Trachemys scripta | 05/10/07 | Menard | N39.98824 | W089.83468 | before 80 |
| Trachemys scripta | 06/13/06 | Macoupin | N39.2162 | W090.01155 | before 80 |
| Trachemys scripta | 04/18/06 | Menard | N39.96505 | W089.74668 | new |
| Trachemys scripta | 06/05/07 | Franklin | N38.35222 | W088.93639 | new |
| Trachemys scripta | 07/12/07 | Moultrie | N39.57581 | W088.52773 | new |
| Trachemys scripta | 06/13/06 | Kendall | N41.62238 | W088.52443 | new |
| Trachemys scripta | 05/31/06 | Menard | N40.02533 | W089.84053 | new (dup 06) |
| Trachemys scripta | 05/18/07 | Menard | N40.06855 | W089.83062 | new (dup 06) |
| Trachemys scripta | 06/29/06 | Menard | N39.96918 | W089.80551 | new (dup 06) |

Appendix III. Herpetofauna observed at or adjacent to Cypress Pond State Natural Area, from August through November 2007. Asterisk = photo voucher obtained.

| SPECIES | Observed on CPSNA | Observed adjacent to CPSNA |
|---|---|---|
| Salamanders | | |
| Ambystoma opacum* | X | |
| Ambystoma talpoideum* | X | |
| Ambystoma texanum* | X | |
| Eurycea lucifuga | | X |
| Plethodon glutinosus* | X | |
| Frogs | | |
| Acris crepitans* | X | |
| Bufo fowleri* | X | |
| Hyla avivoca | X voice only | |
| Hyla chrysoscelis* | X | |
| Hyla cinerea* | X | |
| Pseudacris crucifer | X voice only | |
| Pseudacris feriarum | X voice only | |
| Rana catesbeiana* | X | |
| Rana clamitans* | X | |
| Rana sphenocephala* | X | |
| Turtles | | |
| Apalone spinifera | X | |
| Chelydra serpentina * | X | |
| Chrysemys picta* | X | |
| Terrapene carolina* | X | |
| Trachemys scripta* | X | |
| Lizards | | |
| Scincella lateralis | X | |
| Snakes | | |
| Agkistrodon piscivorus* | | X |
| Coluber constrictor | X shed skin | |
| Elaphe obsoleta* | | X |
| Nerodia erythrogaster | X | |
| Nerodia sipedon | X | |