Assessment of Herpetological Species in Greatest Conservation Need (SGCN) in Illinois Bottomland Forests and Swamps

SWG Project T-112-R-1

FINAL GRANT REPORT

April 16, 2021

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Executive Summary

Approximately 220 million acres of wetlands are estimated to have existed in the continental U.S. before 1700. Since, over half of the original wetlands have been drained and converted to other uses. This form of habitat loss has played a large role in the current biodiversity crisis that has received a great deal of attention over the past two decades. Extinction rates for plants and animals are estimated to be 1,000 times higher than background rates from the fossil record. Of the vertebrate groups completely evaluated (birds, mammals, and amphibians), the International Union for the Conservation of Nature (IUCN) found that 12% of all bird species, 21% of all mammal species, and 30% of all amphibian species were at risk of extinction. Further, while the assessment has only recently begun, it is believed an even greater percentage of reptiles are at risk of extinction. Although multiple factors have contributed to these declines, it is widely accepted the primary threat facing wildlife is habitat loss and degradation.

Animals such as amphibians and semi-aquatic reptiles depend on wetlands for all or part of their life cycle, meaning their survival is directly linked to the presence and ecological health of wetlands. In Illinois, 32 of the 41 amphibians and 47 of the 61 reptiles are wetland-dependent species. While the U.S. loses approximately 60,000 acres of wetlands annually, more than 90% of original wetlands in Illinois have been lost for various land uses and most remaining wetlands have been degraded; therefore inventory, ecological assessment, and protection of wetlands is a high priority within the state of Illinois. Wooded wetlands (bottomland forest ponds and swamps) are a critical ecological habitat concentrated in southern Illinois and are important to many species. Amphibians and reptiles play critical roles in both aquatic and terrestrial habitats, reach their highest diversities in the wooded wetlands of southern Illinois and serve as important ecological indicators of overall wooded wetland health and function. However, the distribution, abundance, and population trends of most amphibian and reptile Species in Greatest Conservation Need (SGCN) are poorly understood, and data are lacking to quantify any potential declines in Illinois. Additionally, rigorous and repeatable sampling methods have not been developed for most amphibian and reptile SGCN. If the primary goals of the Illinois wildlife action plan (IWAP) are to be achieved, then a field-based assessment of amphibian and reptile SGCN status and distribution is a crucial first step in developing long-term conservation plans for these taxa. Further, an updated inventory of wetland habitat is needed, as well as additional research on the ecological aspects of high-quality wetland sites.

The purpose of this project was to provide current information on the status of amphibian and reptile SGCN in southern Illinois bottomland forests and swamps within three Conservation Opportunity Areas (29 – LaRue-Pine Hills COA; 30 – Eastern Shawnee COA; 31 – Cache River-Cypress Creek COA). We sampled 77 bottomland forest pond and swamp sites across the three COAs during the first three year of this project (n = ~25 sites per year). We replicated sites within properties to minimize species going undetected due to fine scale habitat differences within sampled properties. Each property had 2 to 4 sampling sites. Most sites were located on public lands; we anticipated sampling a subset of sites in 2020 (~20 sites) located on private lands to provide a comparative assessment of site types (public vs. private lands). However, the COVID-19 pandemic prevented all field work in 2020. At each site, sampling surveys were conducted during three separate seasonal periods (Early Spring – March/April; Early Summer – May/June; Fall – September/October) to increase the probability of species detection due to variation in circannual activity cycles. All sites were sampled using passive sampling techniques to eliminate observer bias and aid in the standardization of a sampling protocol which can be

repeated by future researchers. Each site was sampled with three trap types: 1) unbaited minnow traps; 2) baited hoop traps; and 3) arboreal pipe traps. At each site, we deployed 12 minnow traps and 8 turtle traps. We also installed 15 arboreal pipe traps (Johnson 2005) within 25 m of the wetland edge. All amphibians (adult and larvae) and reptiles (adult and juvenile) captured were identified to species and assigned an age-class before being released at the point of capture. We recorded the number of individuals per species captured during each sampling event.

Across the 77 sampling sites, we documented the presence of *Ambystoma talpoideum* at 30 sites (39%), *Notophthalmus viridescens* at 37 sites (48%), *Siren intermedia* at 41 sites (53%), and *Hyla avivoca* at 44 sites (57%). Given our first sampling period always occurred in early April, we likely missed breeding migrations of *A. talpoideum* and our data underestimates their true distribution across our sampling area. While *A. talpoideum* has a restricted range in Illinois, the species appears to be relatively widespread and abundant in southern Illinois. Likewise, both *N. viridescens* and *S. intermedia* were encountered at approximately 50% of our sampling sites and appear to be widespread and stable in southern Illinois. Surprisingly, *H. avivoca* was encountered at 57% of our sampling sites. However, there was wide variation in the number of initial captures (and recaptures) amongst sites. It appears *H. avivoca* requires higher quality swamps, but more detailed habitat use and demographic data are needed. Further, given the species reliance on high-quality swamps, they can serve as an indicator of water quality and ecosystem health (as well as an indicator of swamp restoration success).

We documented the presence of *Thamnophis sauritus* at one site (1%), *Nerodia cyclopion* at three sites (4%), *Farancia abacura* at eight sites (10%), *Nerodia erythrogaster neglecta* at 12 sites (16%), *Terrapene carolina* at 17 sites (22%), and *Kinosternon subrubrum* at 18 sites (23%). Given the single capture of *T. sauritus* and all encounters of *T, carolina* were observations (and we would not expect to otherwise capture either species using our swamp sampling methodology), the data we present almost certainly represents an underestimation of their status in southern Illinois. Unsurprisingly, *N. cyclopion* was encountered at only three sites within LaRue-Pine Hills Ecological Research Area; it appears this is the last remaining site for the species in Illinois. Also of note, despite relatively intensive sampling over many sites in southern Illinois, we did not encounter *Nerodia fasciata*. To more rigorously assess whether the species is extant in Illinois, we would recommend a focused sampling effort in the swamps of Massac County. We captured *F. abacura* at approximately 10% of our sites, which we considered good considering the species' secretive nature that makes them notoriously difficult to sample. Baited turtle traps (using sardines) were especially effective for capturing them. Lastly, we encountered *K. subrubrum* at approximately 25% of our sites; most encounters were at higher quality wetlands and abundances were low across all sites. *Kinosternon subrubrum* was listed as a SGCN in the original Illinois wildlife action plan (IDNR 2005) but removed from the list in the second version of the wildlife action plan (IDNR 2015). Given the relatively low number of sites where the species was present, in addition to low capture numbers across these sites, we would recommend *K. subrubrum* be restored to the Illinois wildlife action plan SGCN list as soon as logistically possible. Additionally, more targeted surveys and demographic information are needed for this species.

Introduction

The U.S. Clean Water Act mandates protection of the physical, chemical, and biological integrity of wetlands. Despite the attention given to the "no net loss" of wetland acreage (quantity), much less political and management attention has focused on the ecological integrity (quality) of wetlands even though the wetland protection program requires measurable ecological performance goals as opposed to measuring acres of wetlands restored (NAS 2001; Mack 2007). The organisms inhabiting a natural ecosystem, both individually and as communities, are indicators of the actual conditions in that system since they are subject to the physical and chemical properties of the system and natural and human-caused variation (Ohio EPA 1988; Ohio EPA 1989).

Approximately 220 million acres of wetlands are estimated to have existed in the continental U.S. before 1700 (U.S. EPA 2003). Since, over half of the original wetlands have been drained and converted to other uses. This form of habitat loss has played a large role in the current biodiversity crisis that has received a great deal of attention over the past two decades. Extinction rates for plants and animals are estimated to be 1,000 times higher than background rates from the fossil record (Baillie et al. 2004). Of the vertebrate groups completely evaluated (birds, mammals, and amphibians), the International Union for the Conservation of Nature (IUCN) found that 12% of all bird species, 21% of all mammal species, and 30% of all amphibian species were at risk of extinction (IUCN 2009). Further, while the assessment has only recently begun, it is believed an even greater percentage of reptiles are at risk of extinction (Gibbons et al. 2000; IUCN 2009). Although multiple factors have contributed to these declines, it is widely accepted the primary threat facing wildlife is habitat loss and degradation (Cushman 2006).

Amphibian and semi-aquatic reptile (i.e., turtles and snakes that are wetland-dependent) assemblages comprise critical ecological components of many wetland ecosystems. Amphibians play a significant role in food webs as both predators of invertebrates and prey of larger vertebrates (Davic and Welsh 2004), and they often exceed the combined biomass of other terrestrial vertebrates within the system (Burton and Likens 1975; Peterman et. al 2008). Due to their unique life history cycle, amphibians can potentially supply a large proportion of the energy transfer between aquatic and terrestrial habitats (Gibbons et al. 2006). Within wetland ecosystems, many semi-aquatic reptiles are top predators, and therefore, a decline in their numbers can have severe consequences on ecosystem function (Reading et al. 2010). Additionally, amphibians and semi-aquatic reptiles can serve as bioindicators of environmental change because they are sensitive to various forms of environmental and habitat alteration (Storfer 2003; Gardner et al. 2007). Due to their importance in wetland ecosystems and their status as indicator taxa, amphibians and semi-aquatic reptiles can serve as models for understanding the roles that seasonal and semi-permanent wetlands play in ecosystem function.

Animals such as amphibians and semi-aquatic reptiles depend on wetlands for all or part of their life cycle, meaning their survival is directly linked to the presence and ecological health of wetlands. In Illinois, 32 of the 41 amphibians and 47 of the 61 reptiles are wetland-dependent species (Phillips et al. 1999; U.S. EPA 2003). While the U.S. loses approximately 60,000 acres of wetlands each year (U.S. EPA 2004), more than 90% of original wetlands in Illinois have been lost for various land uses and most remaining wetlands have been degraded (Suloway and Hubbell 1994; IDNR 2005 - IWAP III. E.); therefore inventory, ecological assessment, and protection of wetlands is a high priority within the state (IDNR 2005). Wooded wetlands

(bottomland forest ponds and swamps) are a critical ecological habitat concentrated in southern Illinois (IDNR 2005 - IWAP Fig. 14) and are essential to many species (IDNR 2005 - IWAP III. E. and F.). Amphibians and reptiles play critical roles in both aquatic and terrestrial habitats, reach their highest diversities in the wooded wetlands of southern Illinois (IDNR 2005 - IWAP III. B.) and serve as important ecological indicators of overall wooded wetland health and function. However, the distribution, abundance, and population trends of most amphibian and reptile SGCN are poorly understood, and data are lacking to quantify any potential declines in Illinois (IDNR 2005 - IWAP III. F.). Additionally, rigorous and repeatable sampling methods have not been developed for most amphibian and reptile SGCN (IDNR 2005 - IWAP III. F.). If the primary goals of the IWAP are to be achieved, then a field-based assessment of amphibian and reptile SGCN status and distribution is a crucial first step in developing long-term conservation plans for these taxa (IDNR 2005 - IWAP III. E. Wetlands Actions 1h, 3e, and III. F.). Further, an updated inventory of wetland habitat is needed (IDNR 2005 - IWAP III. E. Wetlands Action 3b), as well as additional research on the ecological aspects of high-quality wetland sites (IDNR 2005 - IWAP III. E. Wetlands Action 3c).

Objectives

The purpose of this project was to provide current information on the status of amphibian and reptile Species in Greatest Conservation Need (SGCN) in southern Illinois bottomland forests and swamps within three Conservation Opportunity Areas (29 – LaRue-Pine Hills COA; 30 – Eastern Shawnee COA; 31 – Cache River-Cypress Creek COA). Funds approved for this grant were used to:

1) Provide an ecological assessment of bottomland forest ponds and swamps in southern Illinois Conservation Opportunity Areas;
2) Provide updated status assessments of amphibian and reptile SGCN in southern Illinois Conservation Opportunity Areas;
3) Provide a comparative status assessment of amphibian and reptile SGCN on private lands in southern Illinois Conservation Opportunity Areas; and
4) Write and disseminate a final report for this project.

It is important to note Objective 3 was added to the grant in Fall of 2019 as a no-cost extension item. However, due to the COVID-19 pandemic, we were not able to conduct any fieldwork in calendar year 2020 to address Objective 3 because of the Illinois Governor's stay-at-home order earlier in 2020 (first two sampling periods) and Lewis & Clark Community College's ban on out-of-district and overnight travel through the end of 2020 (third and final sampling period).

Methods

To assess and evaluate the current distribution and status of amphibian and reptile SGNC in southern Illinois, we sampled in three Conservation Opportunity Areas (COA). The 3 COAs sampled were: #29 (LaRue-Pine Hills), #30 (Eastern Shawnee), and #31 (Cache River-Cypress Creek). We sampled 77 bottomland forest pond and swamp sites across the three COAs during the first three year of this project (n = ~25 sites per year; Figs. 1, 2, & 3). We replicated sites within properties to minimize species going undetected due to fine scale habitat differences within sampled properties. Each property had 2 to 4 sampling sites. Most sites were located on

public lands; we anticipated sampling a subset of sites in 2020 (~20 sites) located on private lands to provide a comparative assessment of site types (public vs. private lands). However, as mentioned in the Objectives section, the COVID-19 pandemic prevented all field work in 2020.

At each site, sampling surveys were conducted during three separate seasonal periods (Early Spring – March/April; Early Summer – May/June; Fall – September/October) to increase the probability of species detection due to variation in circannual activity cycles. Additionally, due to fluctuations in population sizes and suspected detection rates between taxonomic groups (i.e., rare species have lower detection rates than common species), sites were sampled for three nights per period (n = 9 samples per site). All sites were sampled using passive sampling techniques to eliminate observer bias and aid in the standardization of a sampling protocol future researchers can repeat. Each site was sampled with three trap types: 1) unbaited minnow traps; 2) baited hoop traps; and 3) arboreal pipe traps. At each site, we deployed 12 minnow traps and 8 turtle traps. We also installed 15 arboreal pipe traps (Johnson 2005) within 25 m of the wetland edge. All amphibians (adult and larvae) and reptiles (adult and juvenile) captured were identified to species and assigned an age-class before being released at the point of capture. We recorded the number of individuals per species captured during each sampling event.

In addition to the biotic data collected at each wetland site, we also recorded the following onsite environmental metrics: site coordinates, fish presence/absence, and approximate hydroperiod (semi-permanent or permanent; Table 1). Wetland viability was assessed using landscape habitat metrics (Table 2) in conjunction with the herpetological diversity metrics from each wetland site (i.e., species richness.). Terrestrial land use/land cover metrics were calculated in ArcGIS using a 1000 m buffer around the center point of each site. Specifically, we calculated the percentage of each habitat type in the 1000 m buffer: 1) Developed Land; 2) Forest Cover; 3) Grassland; and 4) Agriculture. Using a general linear model, we assessed the effects of each of the four landscape metrics above on wetland viability (as indicated by herpetological species richness).

To meet the four objectives of the project proposal, we had eight jobs:

1) Objective 1, Job 1a – Complete an inventory update of bottomland forest and swamp habitat in southern Illinois.
2) Objective 1, Job 1b – Assess wetland site quality via herpetological diversity metrics.
3) Objective 1, Job 1c – Evaluate the viability of wetlands via local and landscape habitat metrics.
4) Objective 2, Job 2a – Develop and implement a sampling protocol for bottomland forest and swamp and reptile species.
5) Objective 2, Job 2b – Quantify the status and distribution of amphibian and reptile SGCN in southern Illinois COAs on public lands.
6) Objective 2, Job 2c – Identify priority areas for continued monitoring of amphibian and reptile SGCN in southern Illinois COAs on public lands.
7) Objective 3, Job 3a – Quantify the status and distribution of amphibian and reptile SGCN in southern Illinois COAs on private lands.
8) Objective 4, Job 4a – Prepare a final report providing information for incorporation into wildlife action plan updates and to help guide future management decisions.

Results

Objective 1, Job 1a – Complete an inventory update of bottomland forest and swamp habitat in southern Illinois.

COMPLETED.

From 2017–2019, we sampled 77 sites distributed across 23 different properties (Figs. 1, 2, & 3). Thirty-seven sites were located on Illinois Department of Natural Resources (IDNR) land, 20 sites were located on U.S. Forest Service (USFS) land, 10 sites were located on U.S. Fish and Wildlife Service (USFWS) land, nine sites were located on Illinois Department of Corrections (IDOC) land, and 1 site was located on land owned by Southern Illinois University Carbondale (SIUC; Table 1). We collected both onsite and GIS data at each site (Tables 1 & 2).

During the 2017 field season, we sampled 25 sites distributed across 9 properties (Tables 1 & 2). Species occurrence and relative abundance for each site (separated by capture method) can be found in Supplemental Tables 1–25. For observations, an X denotes species was observed at the site outside of the trapping methods detailed above. United States Forest Service (USFS) properties are highlighted in blue; United States Fish and Wildlife Service (USFWS) properties are highlighted in yellow; and Illinois Department of Natural Resources (IDNR) properties are highlighted in gray. In each table, amphibian species names are followed with an A or L to denote adult and larval captures. We captured three species (*Ambystoma talpoideum*, *Kinosternon subrubrum*, and *Nerodia erythrogaster neglecta*) listed as SGCN in the 2005 Wildlife Action Plan; three species (*Notophthalmus viridescens*, *Siren intermedia*, and *Terrapene carolina*) listed as SGCN in the 2015 Wildlife Action Plan; and three species (*Hyla avivoca*, *Farancia abacura*, and *Thamnophis sauritus*) listed as SGCN in both Wildlife Action Plans (two of which are also listed as state threatened species – *Hyla avivoca* and *Thamnophis sauritus*). A summary of site occurrences and the properties that each SGCN was captured at can be found in Table 3.

During the 2018 field season, we sampled 25 sites distributed across 10 properties (Tables 1 & 2). Species occurrence and relative abundance for each site (separated by capture method) can be found in Supplemental Tables 26–50. For observations, an X denotes species was observed at the site outside of the trapping methods detailed above. United States Forest Service (USFS) properties are highlighted in blue (as well as one site that is located on Southern Illinois University Carbondale property); United States Fish and Wildlife Service (USFWS) properties are highlighted in yellow; and Illinois Department of Natural Resources (IDNR) properties are highlighted in gray. In each table, amphibian species names are followed with an A or L to denote adult and larval captures. We captured two species (*Ambystoma talpoideum* and *Nerodia erythrogaster neglecta*) listed as SGCN in the 2005 Wildlife Action Plan; three species (*Notophthalmus viridescens*, *Siren intermedia*, and *Terrapene carolina*) listed as SGCN in the 2015 Wildlife Action Plan; and three species (*Hyla avivoca*, *Farancia abacura*, and *Nerodia cyclopion*) listed as SGCN in both Wildlife Action Plans (two of which are also listed as state threatened or endangered species – *Hyla avivoca*, threatened; and *Nerodia cyclopion*, endangered). A summary of site occurrences and the properties that each SGCN was captured at can be found in Table 4.

During the 2019 field season, we sampled 27 sites distributed across 7 properties (Tables 1 & 2). Species occurrence and relative abundance for each site (separated by capture method) can be found in Supplemental Tables 51–77. For observations, an X denotes species was observed at the site outside of the trapping methods detailed above. United States Forest Service

(USFS) properties are highlighted in blue; United States Fish and Wildlife Service (USFWS) properties are highlighted in yellow; Illinois Department of Natural Resources (IDNR) properties are highlighted in gray; Illinois Department of Corrections (IDOC) properties are highlighted in green. In each table, amphibian species names are followed with an A or L to denote adult and larval captures. We captured three species (*Ambystoma talpoideum*, *Kinosternon subrubrum*, and *Nerodia erythrogaster neglecta*) listed as SGCN in the 2005 Wildlife Action Plan; three species (*Notophthalmus viridescens*, *Siren intermedia*, and *Terrapene carolina*) listed as SGCN in the 2015 Wildlife Action Plan; and two species (*Hyla avivoca* and *Farancia abacura*) listed as SGCN in both Wildlife Action Plans (one of which is also listed as state threatened species – *Hyla avivoca*, threatened). A summary of site occurrences and the properties where each SGCN was captured can be found in Table 5.

Objective 1, Job 1b – Assess wetland site quality via herpetological diversity metrics.

COMPLETED.

To yield insight into the distribution of higher quality wetlands for amphibians and reptiles in the three southern Illinois COAs, we assessed wetland site quality by the total number of SGCN captured (using both the 2005 and 2015 lists). Specifically, sites with three or more SGCNs captured were ranked 'higher quality', sites with 2 SGCNs were ranked 'intermediate quality', and sites with one or fewer SGCNs were ranked 'lower quality'. For overall herpetological species richness, the top 25 sites were ranked 'higher quality', the next 25 sites were ranked 'intermediate quality', and the lowest 27 sites were ranked 'lower quality'. Rankings for the 2005 SGCNs, 2015 SGCNs, and overall herpetological species richness can be found in Tables 6–8, respectively. Given the lower numbers of SGCNs captured, the wetland rankings for herpetological species richness likely provide the best measure (i.e., ranking) of site quality.

Objective 1, Job 1c – Evaluate the viability of wetlands via local and landscape habitat metrics.

COMPLETED.

We assessed wetland viability using landscape habitat metrics in conjunction with the herpetological diversity metrics from each wetland site (see results from Job 1b.). We then calculated the percentage of each habitat type in the 1000 m buffer surrounding the center point of each site: 1) Developed Land; 2) Forest Cover; 3) Grassland; and 4) Agriculture. Using a simple linear model (landscape metrics were the predictor variables), we found that the amount of developed land, grasslands, and agriculture were uninformative in predicting 2005 SGCN richness, 2015 SGCN richness, or overall herpetological species richness. Developed land metric – 2005 SGCN richness $R^2 = 0.047$; 2015 SGCN richness $R^2 = 0.053$; and Overall richness $R^2 = 0.009$. Grasslands metric – 2005 SGCN richness $R^2 = 0.005$; 2015 SGCN richness $R^2 = 0.016$; and Overall richness $R^2 = 0.001$. Agriculture metric – 2005 SGCN richness $R^2 = 0.015$; 2015 SGCN richness $R^2 = 0.005$; and Overall richness $R^2 = 0.011$. The forest cover habitat metric was moderately informative in predicting 2005 SGCN richness ($R^2 = 0.219$; Fig. 4), 2015 SGCN richness ($R^2 = 0.251$; Fig. 5), and overall herpetological richness ($R^2 = 0.248$; Fig. 6).

Objective 2, Job 2a – Develop and implement a sampling protocol for bottomland forest and swamp and reptile species.

COMPLETED.

We sampled all sites using passive sampling techniques to eliminate observer bias and aid in the standardization of a sampling protocol that can be repeated by future researchers. Each site was sampled with three trap types: 1) unbaited minnow traps (n=12); 2) baited hoop traps (n=8); and 3) arboreal pipe traps (n=15). Arboreal pipe traps were attached to woody vegetation (with adjustable bungee cords) within 25 m of the wetland. All amphibians (adult, juvenile, and larvae) and reptiles (adult and juvenile) were identified to species and assigned an age-class before being released at the point of capture. We recorded the number of individuals per species captured in each sampling event.

Objective 2, Job 2b – Quantify the status and distribution of amphibian and reptile SGCN in southern Illinois COAs on public lands.

COMPLETED.

To provide a status assessment of amphibian and reptile SGCN, we documented site presence for each species at the 77 wetland sites we sampled in southern Illinois (Tables 9 & 10). Based on our sampling, we generated species presence maps (from only the sites sampled in this project) for *Ambystoma talpoideum* (2005; Fig. 7), *Hyla avivoca* (2005, 2015; Fig. 8), *Notophthalmus viridescens* (2015; Fig. 9), *Siren intermedia* (2015; Fig. 10), *Farancia abacura* (2005, 2015; Fig. 11), *Kinosternon subrubrum* (2005; Fig. 12), *Nerodia cyclopion* (2005, 2015; Fig. 13), *Nerodia erythrogaster neglecta* (2005; Fig. 14), *Terrapene carolina* (2015; Fig. 15), and *Thamnophis sauritus* (2005, 2015; Fig. 16). The year in parentheses represents the IWAP list that includes each species. *Hyla avivoca*, *Nerodia cyclopion*, and *Thamnophis sauritus* are all state-listed species. As such, all capture data was sent to the Illinois Natural Heritage database at the end of each field season (Table 11).

Objective 2, Job 2c – Identify priority areas for continued monitoring of amphibian and reptile SGCN in southern Illinois COAs on public lands.

COMPLETED.

Our status assessments of amphibian and reptile SGCN (see Job 2b.) were used to determine SGCN priority monitoring sites. Based on our sampling, we recommend 10 of our 77 sites be used for long-term monitoring (which can be used for status and trends assessments). We chose the top 10 sites (Table 12) using 2015 SGCN presence data (Table 7). At the top five sites, we documented 4 or more SGCN. The next five sites were originally in a group of 20 sites, all of which had 3 documented SGCN. From this group of 20 sites, we chose the top five sites based on total herpetological species richness (Table 8).

In lieu of monitoring specific sites, we also provide amphibian and reptile 2015 SGCN and total richness values for replicate sites in a property (Table 13). The richness values at the sub-property level are more robust against the likelihood of species going undetected at the site

level due to random chance and fine scale habitat differences between sites, while also taking into account differences in swamps within properties. For this reason, we would recommend using the top sites at the sub-property level for setting up a monitoring program (Table 13). When examined at this spatial level, we documented 5 SGCN at the top four properties and the next five properties each had 4 SGCN.

Objective 3, Job 3a – Quantify the status and distribution of amphibian and reptile SGCN in southern Illinois COAs on private lands.

NOT COMPLETED.

Objective 3 was added to the grant in Fall of 2019 as a no-cost extension item. However, due to the COVID-19 pandemic, we were not able to conduct any fieldwork in calendar year 2020 to address Objective 3 because of the Illinois Governor's stay-at-home order (first two sampling periods) and Lewis & Clark Community College's ban on out-of-district and overnight travel through the end of 2020 (third and final sampling period). Funds that were allocated to this portion of the grant were not spent and reverted back to the Illinois Department of Natural Resources.

Objective 4, Job 4a – Prepare a final report providing information for incorporation into wildlife action plan updates and to help guide future management decisions.

COMPLETED.

This final report provides information that can be used to update the Illinois wildlife action plan and provides guidance for future management decisions.

Summary Conclusions and Recommendations

Sampling Methodology

In addition to typical herpetological trapping methods (unbaited minnow traps and baited hoop traps), we used both aquatic trash can traps (Luhring and Jennison 2008) and arboreal PVC pipe traps during the 2017 field season. The aquatic trash can traps did not capture any novel species (when compared to minnow and hoop traps) and yielded low capture numbers. This was a somewhat surprising result since Luhring and Jennison (2008) had success using these types of traps in swamp habitats, particularly for fully aquatic salamanders such as amphiuma and siren. However, most of their captures were the large fully aquatic salamanders Amphiuma and Greater Siren (as opposed to the smaller Lesser Siren in Illinois), so size may play some role in capture success. Given our lack of success with the trash can traps, we discontinued their use to streamline sampling efforts.

The arboreal pipe traps were highly effective in sampling for treefrogs, specifically the state-threatened Bird-voiced Treefrog (*Hyla avivoca*). In 2017, we detected Bird-voiced Treefrog at 23 of the 25 sampling sites and captured 273 Bird-voiced Treefrog in the pipe traps (151 individuals and 122 recaptures). As such, we continued to deploy arboreal pipe traps (along with minnow and hoop traps) for swamp sampling in 2018 and 2019. With such high capture and

recapture success in limited sampling, pipe traps offer an effective way to census Bird-voiced Treefrog populations with minimal effort once pipe traps are deployed.

We designed a sampling methodology that relied on passive sampling techniques (minnow traps, turtle traps, and pipe traps) only so that future researchers could easily replicate our work or employ the methodology at new sites. However, we should note some of our captures that were included in the wetland site species lists (Supplemental Tables 1–77) were incidental observations while checking passive traps. While these incidental observations were haphazard (and time spent on incidental observations was not highly variable across sites), they are an important data source that warranted inclusion in our analyses and report. To better standardize the collection and use of such data, we would recommend future surveys include both our passive trapping methods and a standardized visual encounter search transect that is either area- or time-constrained.

Land Use

Of the four landscape habitat categories we estimated (developed land, forest cover, grasslands, and agriculture), only the amount of forest cover within a 1000 m buffer positively influenced both SGCN and overall herpetological species richness. This is an unsurprising result because our target species group relies on high-quality aquatic and terrestrial habitats. Of greater interest is that agriculture had no apparent detrimental effects on species richness despite its prevalence on the landscape. However, it should be cautioned that agricultural effects usually manifest themselves in reduced and eliminated connectivity which is important for rescue-recolonization dynamics and gene flow. Further, a 1000 m buffer may not be the appropriate scale to test for these effects. More targeted studies of agricultural effects on swamp-dependent species are needed to better understand these population dynamics (as well as help target new land for conservation initiatives such as habitat acquisition and restoration).

To investigate the importance of private lands in conserving swamp-dependent amphibian and reptile species, we added an additional no-cost objective to the study that was to begin in 2020. Using the sampling methodology described in Job 2a (see results section), SGCN distribution and status were to be quantified for each species by site presence/absence across approximately 20 swamp sites on private lands. We anticipated generating presence/absence distribution maps for SGCN and compare herpetological diversity on public and private lands in southern Illinois. Unfortunately, due to the COVID-19 pandemic, we were not able to conduct any fieldwork in calendar year 2020 to address objective because of the Illinois Governor's stay-at-home order earlier in 2020 (first two sampling periods) and Lewis & Clark Community College's ban on out-of-district and overnight travel through the end of 2020 (third and final sampling period). Funds allocated to this portion of the grant were not spent and reverted to the Illinois Department of Natural Resources. As such, we would encourage a future study to compare private swamp sites with public swamp sites to better understand the status of SGCN in southern Illinois and identify potential conservation opportunities (land acquisitions, conservation easements, etc.).

Amphibian and Reptile SGCN

Across the 77 sampling sites, we documented the presence of *Ambystoma talpoideum* at 30 sites (39%), *Notophthalmus viridescens* at 37 sites (48%), *Siren intermedia* at 41 sites (53%), and

Hyla avivoca at 44 sites (57%). Given our first sampling period always occurred in early April, we likely missed breeding migrations of *A. talpoideum* and our data underestimates their true distribution across our sampling area. While *A. talpoideum* has a restricted range in Illinois, it appears to be relatively widespread and abundant in southern Illinois. Likewise, both *N. viridescens* and *S. intermedia* were encountered at approximately 50% of our sampling sites and appear to be widespread and stable in southern Illinois. Surprisingly, *H. avivoca* was encountered at 57% of our sampling sites. However, there was wide variation in the number of initial captures (and recaptures) amongst sites (see Supplemental Tables 1–77 for individual site capture numbers). It appears that *H. avivoca* requires higher quality swamps, but more detailed habitat use and demographic data are needed. Further, given the species reliance on high-quality swamps, they can serve as an indicator of water quality and ecosystem health (as well as an indicator of swamp restoration success).

We documented the presence of *Thamnophis sauritus* at one site (1%), *Nerodia cyclopion* at three sites (4%), *Farancia abacura* at eight sites (10%), *Nerodia erythrogaster neglecta* at 12 sites (16%), *Terrapene carolina* at 17 sites (22%), and *Kinosternon subrubrum* at 18 sites (23%). Given the single capture of *T. sauritus* and all encounters of *T, carolina* were observations (and we would not expect to otherwise capture either species using our swamp sampling methodology), the data we present on both species almost certainly represents an underestimation of their statuses in southern Illinois. Unsurprisingly, *N. cyclopion* was encountered at only three sites within LaRue-Pine Hills Ecological Research Area; it appears this is the last remaining site for this species in Illinois. Also of note, despite relatively intensive sampling over many sites in southern Illinois, we did not encounter *Nerodia fasciata*. To more rigorously assess whether the species is extant in Illinois, we would recommend a focused sampling effort in the swamps of Massac County. We captured *F. abacura* at approximately 10% of our sites, which we considered quite good considering the species' secretive nature that makes them notoriously difficult to sample. Baited turtle traps (using sardines) were especially effective for capturing them. Lastly, we encountered *K. subrubrum* at approximately 25% of our sites; most encounters were at higher quality wetlands, and abundances were low across all sites (see Supplemental Tables 1–77 for individual site capture numbers). *Kinosternon subrubrum* was listed as a SGCN in the original Illinois wildlife action plan (IDNR 2005) but removed from the list in the second version of the wildlife action plan (IDNR 2015). Given the relatively low number of sites where the species was present, its absence from our western sampling sites, and low capture numbers across these sites, we would recommend that *K. subrubrum* be restored to the Illinois wildlife action plan SGCN list as soon as logistically possible. Additionally, more targeted surveys and demographic information are needed for this species.

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Tables

Table 1. Environmental metrics recorded at 77 swamp sites in southern Illinois (2017–2019). For fish, 0 = absent, 1 = present. For the hydroperiod assessment, sites were visited in late fall to determine if they still held water. If water was present, a swamp was classified as permanent; if water was absent, a swamp was classified as semi-permanent.

Site Number	Site Name	Property Type	Year Sampled	Latitude	Longitude	Fish	Hydroperiod
1	Grantsburg North Swamp	USFS	2017	37.40627	-88.74111	1	Permanent
2	Grantsburg North Swamp	USFS	2017	37.40645	-88.74034	1	Permanent
3	Grantsburg South Swamp	USFS	2017	37.38980	-88.73080	1	Permanent
4	Grantsburg South Swamp	USFS	2017	37.39039	-88.72879	1	Permanent
5	Grantsburg South Swamp	USFS	2017	37.39091	-88.72660	1	Permanent
6	Renshaw Swamp	USFS	2017	37.35540	-88.69106	1	Permanent
7	Renshaw Swamp	USFS	2017	37.35537	-88.68877	1	Permanent
8	Sugar Bottoms Swamp	USFS	2017	37.34349	-88.70156	0	Semi-permanent
9	Sugar Bottoms Swamp	USFS	2017	37.34357	-88.70040	0	Semi-permanent
10	Thorn Pond	IDNR	2017	37.33707	-88.92447	0	Semi-permanent
11	Thorn Pond	IDNR	2017	37.33755	-88.92535	0	Semi-permanent
12	Little Black Slough - West	IDNR	2017	37.35424	-89.01071	1	Permanent
13	Little Black Slough - West	IDNR	2017	37.35486	-89.01102	1	Permanent
14	Hogan's Bottoms - South	USFWS	2017	37.36335	-89.07008	1	Permanent
15	Hogan's Bottoms - North	USFWS	2017	37.37217	-89.07656	1	Permanent
16	Hogan's Bottoms - North	USFWS	2017	37.37318	-89.07643	1	Permanent
17	Hogan's Bottoms - North	USFWS	2017	37.37370	-89.07563	1	Permanent
18	Watson Pond	IDNR	2017	37.37422	-88.93023	1	Permanent
19	Watson Pond	IDNR	2017	37.37414	-88.92839	1	Permanent
20	Little Black Slough - North	IDNR	2017	37.36911	-88.98293	1	Permanent
21	Little Black Slough - North	IDNR	2017	37.36993	-88.98081	1	Permanent
22	Fain Cemetery Swamp	IDNR	2017	37.39195	-88.98436	0	Semi-permanent

23	Fain Cemetery Swamp	IDNR	2017	37.39378	-88.98402	0	Semi-permanent
24	Deer Pond	IDNR	2017	37.42936	-88.93701	0	Semi-permanent
25	Deer Pond	IDNR	2017	37.43037	-88.93647	0	Semi-permanent
26	Mudline Flatwoods	USFWS	2018	37.09618	-89.25242	0	Semi-permanent
27	Mudline Slough	USFWS	2018	37.10202	-89.24835	1	Permanent
28	Unity INAI	IDNR	2018	37.12675	-89.29386	1	Permanent
29	Unity INAI	IDNR	2018	37.12757	-89.29196	1	Permanent
30	Horseshoe Ditch	IDNR	2018	37.13319	-89.29253	1	Permanent
31	Horseshoe Ditch	IDNR	2018	37.13315	-89.29070	1	Permanent
32	Cache Bend Slough	USFWS	2018	37.19951	-89.25282	1	Permanent
33	Cache Bend Slough	USFWS	2018	37.19773	-89.25259	1	Permanent
34	Tamms Pumphouse	USFWS	2018	37.23166	-89.26023	0	Semi-permanent
35	Tamms Pumphouse	USFWS	2018	37.23191	-89.26043	0	Semi-permanent
36	Clear Creek South	USFS	2018	37.28902	-89.41749	1	Permanent
37	Clear Creek South	USFS	2018	37.28940	-89.41696	1	Permanent
38	Clear Creek North	USFS	2018	37.29524	-89.41182	1	Permanent
39	Clear Creek North	USFS	2018	37.29699	-89.41058	1	Permanent
40	Clear Creek North	USFS	2018	37.29828	-89.40971	1	Permanent
41	Union County Conservation Area	IDNR	2018	37.40904	-89.38266	0	Semi-permanent
42	Union County Conservation Area	IDNR	2018	37.40918	-89.38320	0	Semi-permanent
43	Union County Conservation Area	IDNR	2018	37.42237	-89.35632	0	Semi-permanent
44	LaRue Pine Hills - Otter Pond	SIUC	2018	37.54039	-89.43859	1	Permanent
45	LaRue Pine Hills - Otter Pond	USFS	2018	37.54141	-89.43934	1	Permanent
46	LaRue Pine Hills - Otter Pond	USFS	2018	37.54604	-89.44009	1	Permanent
47	LaRue Pine Hills - Winters Pond	USFS	2018	37.58100	-89.44968	1	Permanent
48	LaRue Pine Hills - Winters Pond	USFS	2018	37.58089	-89.45035	1	Permanent
49	LaRue Pine Hills - Winters Pond	USFS	2018	37.58108	-89.45077	1	Permanent
50	LaRue Pine Hills - Winters Pond	USFS	2018	37.58464	-89.44142	1	Permanent
51	Cache Wetlands Center	IDNR	2019	37.31290	-89.01829	1	Permanent

52	Cache Wetlands Center	IDNR	2019	37.31290	-89.01678	1	Permanent
53	Little Black Slough – Eden	IDNR	2019	37.33870	-88.96978	1	Permanent
54	Little Black Slough – Eden	IDNR	2019	37.33753	-88.96827	1	Permanent
55	Little Black Slough – Eden	IDNR	2019	37.33946	-88.96785	1	Permanent
56	Little Black Slough – Belknap	IDNR	2019	37.34730	-88.95883	1	Permanent
57	Little Black Slough – Belknap	IDNR	2019	37.34623	-88.95735	1	Permanent
58	Little Black Slough – Belknap	IDNR	2019	37.34749	-88.95650	1	Permanent
59	Tunnel Hill	IDNR	2019	37.30515	-88.96388	0	Semi-permanent
60	Tunnel Hill	IDNR	2019	37.30562	-88.96399	0	Semi-permanent
61	Mermet Swamp	IDNR	2019	37.24831	-88.82981	0	Semi-permanent
62	Mermet Swamp	IDNR	2019	37.24909	-88.82758	0	Semi-permanent
63	Mermet Swamp	IDNR	2019	37.26139	-88.84395	0	Semi-permanent
64	Mermet Swamp	IDNR	2019	37.26917	-88.84764	0	Semi-permanent
65	Mermet Swamp	IDNR	2019	37.26884	-88.85720	0	Semi-permanent
66	Mermet Swamp	IDNR	2019	37.26830	-88.85603	0	Semi-permanent
67	Big Cypress	IDNR	2019	37.31444	-88.98829	0	Semi-permanent
68	Big Cypress	IDNR	2019	37.31392	-88.98571	0	Semi-permanent
69	Vienna Correctional Center	IDOC	2019	37.40526	-88.75666	0	Semi-permanent
70	Vienna Correctional Center	IDOC	2019	37.40646	-88.75776	0	Semi-permanent
71	Vienna Correctional Center	IDOC	2019	37.40666	-88.76017	0	Semi-permanent
72	Vienna Correctional Center	IDOC	2019	37.41666	-88.77059	1	Permanent
73	Vienna Correctional Center	IDOC	2019	37.41680	-88.76853	1	Permanent
74	Vienna Correctional Center	IDOC	2019	37.41672	-88.76519	1	Permanent
75	Vienna Correctional Center	IDOC	2019	37.43592	-88.76419	0	Semi-permanent
77	Vienna Correctional Center	IDOC	2019	37.40722	-88.75382	1	Permanent
78	Vienna Correctional Center	IDOC	2019	37.40889	-88.75440	1	Permanent

Table 2. Landscape metrics generated via ArcGIS analyses for 77 swamp sites in southern Illinois (2017–2019). Each of the six metrics represents a percent contribution to total land/water surrounding the central location out to 1000 m in all directions.

Site Number	Site Name	Property Type	Year Sampled	Developed Land	Forest Cover	Grassland	Agriculture
1	Grantsburg North Swamp	USFS	2017	2.70	48.34	0.00	21.77
2	Grantsburg North Swamp	USFS	2017	2.73	49.35	0.00	22.36
3	Grantsburg South Swamp	USFS	2017	4.33	21.60	3.66	26.35
4	Grantsburg South Swamp	USFS	2017	4.92	25.48	3.46	27.79
5	Grantsburg South Swamp	USFS	2017	5.60	31.19	3.18	28.18
6	Renshaw Swamp	USFS	2017	1.80	41.27	0.03	32.50
7	Renshaw Swamp	USFS	2017	4.41	43.02	0.06	29.80
8	Sugar Bottoms Swamp	USFS	2017	2.33	46.16	0.00	19.88
9	Sugar Bottoms Swamp	USFS	2017	2.50	49.40	0.00	19.74
10	Thorn Pond	IDNR	2017	3.38	58.22	0.00	10.24
11	Thorn Pond	IDNR	2017	3.29	60.66	0.00	8.64
12	Little Black Slough - West	IDNR	2017	7.20	40.38	0.00	32.30
13	Little Black Slough - West	IDNR	2017	8.36	38.72	0.00	33.20
14	Hogan's Bottoms - South	USFWS	2017	2.45	25.01	0.06	14.32
15	Hogan's Bottoms - North	USFWS	2017	4.36	42.71	0.08	27.74
16	Hogan's Bottoms - North	USFWS	2017	4.02	43.13	0.20	27.69
17	Hogan's Bottoms - North	USFWS	2017	3.97	43.44	0.14	27.74
18	Watson Pond	IDNR	2017	1.63	60.66	2.05	0.59
19	Watson Pond	IDNR	2017	1.63	60.44	2.05	0.82
20	Little Black Slough - North	IDNR	2017	2.98	39.90	0.08	26.08
21	Little Black Slough - North	IDNR	2017	3.12	40.43	0.00	25.58
22	Fain Cemetery Swamp	IDNR	2017	2.81	26.98	0.00	17.39
23	Fain Cemetery Swamp	IDNR	2017	3.32	33.79	0.00	11.42
24	Deer Pond	IDNR	2017	3.88	18.43	0.23	52.08

25	Deer Pond	IDNR	2017	2.70	17.84	0.34	53.38
26	Mudline Flatwoods	USFWS	2018	5.94	13.11	0.76	20.09
27	Mudline Slough	USFWS	2018	4.19	30.47	0.53	20.77
28	Unity INAI	IDNR	2018	4.95	0.03	0.59	5.35
29	Unity INAI	IDNR	2018	4.67	0.03	0.68	10.61
30	Horseshoe Ditch	IDNR	2018	4.50	0.03	0.45	4.31
31	Horseshoe Ditch	IDNR	2018	3.69	0.03	0.51	8.50
32	Cache Bend Slough	USFWS	2018	3.26	13.11	0.00	39.36
33	Cache Bend Slough	USFWS	2018	3.18	13.25	0.00	35.82
34	Tamms Pumphouse	USFWS	2018	25.80	3.07	0.00	9.06
35	Tamms Pumphouse	USFWS	2018	26.03	3.12	0.00	10.07
36	Clear Creek South	USFS	2018	3.91	31.88	0.37	12.67
37	Clear Creek South	USFS	2018	3.89	32.55	0.37	10.22
38	Clear Creek North	USFS	2018	2.59	33.54	0.03	5.29
39	Clear Creek North	USFS	2018	2.59	30.92	0.00	7.43
40	Clear Creek North	USFS	2018	3.60	29.23	0.00	10.25
41	Union County Conservation Area	IDNR	2018	5.97	1.07	0.00	46.82
42	Union County Conservation Area	IDNR	2018	6.00	1.07	0.00	46.40
43	Union County Conservation Area	IDNR	2018	4.82	6.36	0.03	18.25
44	LaRue Pine Hills - Otter Pond	SIUC	2018	3.77	48.96	0.00	0.00
45	LaRue Pine Hills - Otter Pond	USFS	2018	3.92	46.14	0.00	0.25
46	LaRue Pine Hills - Otter Pond	USFS	2018	4.84	45.16	0.00	3.97
47	LaRue Pine Hills - Winters Pond	USFS	2018	5.55	8.68	2.76	2.43
48	LaRue Pine Hills - Winters Pond	USFS	2018	5.35	7.75	3.01	2.90
49	LaRue Pine Hills - Winters Pond	USFS	2018	5.13	8.14	3.13	3.55
50	LaRue Pine Hills - Winters Pond	USFS	2018	6.39	40.20	0.11	4.31
51	Cache Wetlands Center	IDNR	2019	4.05	18.80	0.62	23.13
52	Cache Wetlands Center	IDNR	2019	3.91	18.49	0.31	22.12
53	Little Black Slough – Eden	IDNR	2019	3.66	22.45	0.23	61.76

54	Little Black Slough – Eden	IDNR	2019	3.40	18.63	0.23	67.64
55	Little Black Slough – Eden	IDNR	2019	2.87	25.55	0.28	58.55
56	Little Black Slough – Belknap	IDNR	2019	0.59	37.99	0.11	28.36
57	Little Black Slough – Belknap	IDNR	2019	1.21	42.01	0.23	33.77
58	Little Black Slough – Belknap	IDNR	2019	0.84	42.18	0.00	30.28
59	Tunnel Hill	IDNR	2019	2.93	18.80	0.03	19.13
60	Tunnel Hill	IDNR	2019	2.65	19.33	0.03	20.88
61	Mermet Swamp	IDNR	2019	6.69	2.45	0.06	52.47
62	Mermet Swamp	IDNR	2019	6.22	2.11	0.06	59.11
63	Mermet Swamp	IDNR	2019	7.40	1.86	0.70	18.22
64	Mermet Swamp	IDNR	2019	11.33	2.87	0.51	30.44
65	Mermet Swamp	IDNR	2019	4.81	1.58	0.45	12.57
66	Mermet Swamp	IDNR	2019	5.34	2.31	0.53	12.83
67	Big Cypress	IDNR	2019	1.89	20.74	0.03	22.03
68	Big Cypress	IDNR	2019	2.00	23.97	0.00	24.34
69	Vienna Correctional Center	IDOC	2019	3.57	44.57	0.08	9.17
70	Vienna Correctional Center	IDOC	2019	4.47	42.66	0.14	12.35
71	Vienna Correctional Center	IDOC	2019	9.28	40.07	0.14	14.74
72	Vienna Correctional Center	IDOC	2019	5.23	25.06	0.14	34.03
73	Vienna Correctional Center	IDOC	2019	5.79	21.43	0.17	31.92
74	Vienna Correctional Center	IDOC	2019	5.17	19.83	0.17	23.12
75	Vienna Correctional Center	IDOC	2019	0.00	23.54	0.00	21.93
77	Vienna Correctional Center	IDOC	2019	2.87	38.81	0.08	9.31
78	Vienna Correctional Center	IDOC	2019	3.18	38.39	0.14	12.35

Table 3. **2017 capture summary of SGCN across the nine properties (25 sites) sampled in southern Illinois.**

Species	SGNC Status	No. of Sites	No. of Properties*
Ambystoma talpoideum	2005	15	8 (G, R, S, T, L, H, F, D)
Hyla avivoca	2005, 2015	23	9 (G, R, S, T, L, H, W, F, D)
Notophthalmus viridescens	2015	16	6 (G, R, S, T, L, W)
Siren intermedia	2015	16	7 (G, R, S, L, H, W, F)
Farancia abacura	2005, 2015	2	2 (H, W)
Kinosternon subrubrum	2005	15	7 (G, S, T, L, H, F, D)
Nerodia cyclopion	2005, 2015	0	None
Nerodia erythrogaster neglecta	2005	4	4 (R, H, W, F)
Terrapene carolina	2015	6	6 (R, H, S, W, F, D)
Thamnophis sauritus	2005, 2015	1	1 (R)

*G = Grantsburg Swamp; R = Renshaw Swamp; S = Sugar Bottoms Swamp; T = Thorn Pond; L = Little Black Slough; H = Hogan's Bottoms; W = Watson Pond; F = Fain Cemetery Swamp; and D = Deer Pond.

Table 4. **2018 capture summary of SGCN across the 10 properties (25 sites) sampled in southern Illinois.**

Species	SGCN Status	No. of Sites	No. of Properties*
Ambystoma talpoideum	2005	1	1 (M)
Hyla avivoca	2005, 2015	6	2 (LOP, LWP)
Notophthalmus viridescens	2015	10	3 (UC, LOP, LWP)
Siren intermedia	2015	13	7 (M, T, CS, CN, UC, LOP, LWP)
Farancia abacura	2005, 2015	4	4 (H, T, CN, LOP)
Kinosternon subrubrum	2005	0	None
Nerodia cyclopion	2005, 2015	3	2 (LOP, LWP)
Nerodia erythrogaster neglecta	2005	2	2 (M, CS)
Terrapene carolina	2015	2	1 (M)
Thamnophis sauritus	2005, 2015	0	None

*M = Mudline Swamp; U = Unity INAI Swamp; H = Horseshoe Lake Ditch; C = Cache Bend Slough; T = Tamms Pumphouse Swamp; CS = Clear Creek South Swamp; CN = Clear Creek North Swamp; UC = Union County Conservation Area; LOP = LaRue-Pine Hills (Otter Pond); LWP = LaRue-Pine Hills (Winters Pond).

Table 5. **2019 capture summary of SGCN across the seven properties (27 sites) sampled in southern Illinois.**

Species	SGCN Status	No. of Sites	No. of Properties*
Ambystoma talpoideum	2005	12	5 (LBSE, LBSB, MS, BC, VCC)
Hyla avivoca	2005, 2015	15	4 (LBSE, LBSB, BC, VCC)
Notophthalmus viridescens	2015	12	4 (LBSE, LBSB, BC, VCC)
Siren intermedia	2015	12	5 (LBSB, TH, MS, BC, VCC)
Farancia abacura	2005, 2015	2	2 (MS, VCC)
Kinosternon subrubrum	2005	3	3 (LBSE, LBSB, MS)
Nerodia cyclopion	2005, 2015	0	None
Nerodia erythrogaster neglecta	2005	6	3 (LBSB, MS, VCC)
Terrapene carolina	2015	9	3 (MS, BC, VCC)
Thamnophis sauritus	2005, 2015	0	None

*CW = Cache Wetlands Center; LBSE = Little Black Slough – Eden; LBSB = Little Black Slough – Belknap; TH = Tunnel Hill; MS = Mermet Swamp; BC = Big Cypress; VCC = Vienna Correctional Center.

Table 6. **SGCNs (2005 list) captured across 77 sampling sites in southern Illinois. Sites with three or more SGCNs captured were ranked 'higher quality', sites with 2 SGCNs were ranked 'intermediate quality', and sites with one or fewer SGCNs were ranked 'lower quality'.**

Site Number	Site Name	Property Type	Year Sampled	2005 SGCN Richness	Wetland Ranking
14	Hogan's Bottoms - South	USFWS	2017	5	Higher Quality
22	Fain Cemetery Swamp	IDNR	2017	4	Higher Quality
57	Little Black Slough – Belknap	IDNR	2019	4	Higher Quality
6	Renshaw Swamp	USFS	2017	3	Higher Quality
8	Sugar Bottoms Swamp	USFS	2017	3	Higher Quality
9	Sugar Bottoms Swamp	USFS	2017	3	Higher Quality
10	Thorn Pond	IDNR	2017	3	Higher Quality
13	Little Black Slough - West	IDNR	2017	3	Higher Quality
16	Hogan's Bottoms - North	USFWS	2017	3	Higher Quality
18	Watson Pond	IDNR	2017	3	Higher Quality
20	Little Black Slough - North	IDNR	2017	3	Higher Quality
25	Deer Pond	IDNR	2017	3	Higher Quality
44	LaRue Pine Hills - Otter Pond	SIUC	2018	3	Higher Quality
54	Little Black Slough – Eden	IDNR	2019	3	Higher Quality
74	Vienna Correctional Center	IDOC	2019	3	Higher Quality
75	Vienna Correctional Center	IDOC	2019	3	Higher Quality
1	Grantsburg North Swamp	USFS	2017	2	Intermediate Quality
2	Grantsburg North Swamp	USFS	2017	2	Intermediate Quality
5	Grantsburg South Swamp	USFS	2017	2	Intermediate Quality
7	Renshaw Swamp	USFS	2017	2	Intermediate Quality
11	Thorn Pond	IDNR	2017	2	Intermediate Quality
12	Little Black Slough - West	IDNR	2017	2	Intermediate Quality
15	Hogan's Bottoms - North	USFWS	2017	2	Intermediate Quality

17	Hogan's Bottoms - North	USFWS	2017	2	Intermediate Quality
23	Fain Cemetery Swamp	IDNR	2017	2	Intermediate Quality
24	Deer Pond	IDNR	2017	2	Intermediate Quality
26	Mudline Flatwoods	USFWS	2018	2	Intermediate Quality
45	LaRue Pine Hills - Otter Pond	USFS	2018	2	Intermediate Quality
46	LaRue Pine Hills - Otter Pond	USFS	2018	2	Intermediate Quality
47	LaRue Pine Hills - Winters Pond	USFS	2018	2	Intermediate Quality
53	Little Black Slough – Eden	IDNR	2019	2	Intermediate Quality
55	Little Black Slough – Eden	IDNR	2019	2	Intermediate Quality
58	Little Black Slough – Belknap	IDNR	2019	2	Intermediate Quality
64	Mermet Swamp	IDNR	2019	2	Intermediate Quality
68	Big Cypress	IDNR	2019	2	Intermediate Quality
69	Vienna Correctional Center	IDOC	2019	2	Intermediate Quality
72	Vienna Correctional Center	IDOC	2019	2	Intermediate Quality
73	Vienna Correctional Center	IDOC	2019	2	Intermediate Quality
77	Vienna Correctional Center	IDOC	2019	2	Intermediate Quality
3	Grantsburg South Swamp	USFS	2017	1	Lower Quality
4	Grantsburg South Swamp	USFS	2017	1	Lower Quality
19	Watson Pond	IDNR	2017	1	Lower Quality
21	Little Black Slough - North	IDNR	2017	1	Lower Quality
30	Horseshoe Ditch	IDNR	2018	1	Lower Quality
35	Tamms Pumphouse	USFWS	2018	1	Lower Quality
37	Clear Creek South	USFS	2018	1	Lower Quality
40	Clear Creek North	USFS	2018	1	Lower Quality
43	Union County Conservation Area	IDNR	2018	1	Lower Quality
48	LaRue Pine Hills - Winters Pond	USFS	2018	1	Lower Quality
49	LaRue Pine Hills - Winters Pond	USFS	2018	1	Lower Quality
56	Little Black Slough – Belknap	IDNR	2019	1	Lower Quality
62	Mermet Swamp	IDNR	2019	1	Lower Quality

63	Mermet Swamp	IDNR	2019	1	Lower Quality
66	Mermet Swamp	IDNR	2019	1	Lower Quality
70	Vienna Correctional Center	IDOC	2019	1	Lower Quality
71	Vienna Correctional Center	IDOC	2019	1	Lower Quality
78	Vienna Correctional Center	IDOC	2019	1	Lower Quality
27	Mudline Slough	USFWS	2018	0	Lower Quality
28	Unity INAI	IDNR	2018	0	Lower Quality
29	Unity INAI	IDNR	2018	0	Lower Quality
31	Horseshoe Ditch	IDNR	2018	0	Lower Quality
32	Cache Bend Slough	USFWS	2018	0	Lower Quality
33	Cache Bend Slough	USFWS	2018	0	Lower Quality
34	Tamms Pumphouse	USFWS	2018	0	Lower Quality
36	Clear Creek South	USFS	2018	0	Lower Quality
38	Clear Creek North	USFS	2018	0	Lower Quality
39	Clear Creek North	USFS	2018	0	Lower Quality
41	Union County Conservation Area	IDNR	2018	0	Lower Quality
42	Union County Conservation Area	IDNR	2018	0	Lower Quality
50	LaRue Pine Hills - Winters Pond	USFS	2018	0	Lower Quality
51	Cache Wetlands Center	IDNR	2019	0	Lower Quality
52	Cache Wetlands Center	IDNR	2019	0	Lower Quality
59	Tunnel Hill	IDNR	2019	0	Lower Quality
60	Tunnel Hill	IDNR	2019	0	Lower Quality
61	Mermet Swamp	IDNR	2019	0	Lower Quality
65	Mermet Swamp	IDNR	2019	0	Lower Quality
67	Big Cypress	IDNR	2019	0	Lower Quality

Table 7. **SGCNs (2015 list) captured across 77 sampling sites in southern Illinois. Sites with three or more SGCNs captured were ranked 'higher quality', sites with 2 SGCNs were ranked 'intermediate quality', and sites with one or fewer SGCNs were ranked 'lower quality'.**

Site Number	Site Name	Property Type	Year Sampled	2015 SGCN Richness	Wetland Ranking
18	Watson Pond	IDNR	2017	5	Higher Quality
6	Renshaw Swamp	USFS	2017	4	Higher Quality
8	Sugar Bottoms Swamp	USFS	2017	4	Higher Quality
14	Hogan's Bottoms - South	USFWS	2017	4	Higher Quality
75	Vienna Correctional Center	IDOC	2019	4	Higher Quality
2	Grantsburg North Swamp	USFS	2017	3	Higher Quality
5	Grantsburg South Swamp	USFS	2017	3	Higher Quality
7	Renshaw Swamp	USFS	2017	3	Higher Quality
9	Sugar Bottoms Swamp	USFS	2017	3	Higher Quality
13	Little Black Slough - West	IDNR	2017	3	Higher Quality
19	Watson Pond	IDNR	2017	3	Higher Quality
21	Little Black Slough - North	IDNR	2017	3	Higher Quality
22	Fain Cemetery Swamp	IDNR	2017	3	Higher Quality
44	LaRue Pine Hills - Otter Pond	SIUC	2018	3	Higher Quality
45	LaRue Pine Hills - Otter Pond	USFS	2018	3	Higher Quality
46	LaRue Pine Hills - Otter Pond	USFS	2018	3	Higher Quality
47	LaRue Pine Hills - Winters Pond	USFS	2018	3	Higher Quality
49	LaRue Pine Hills - Winters Pond	USFS	2018	3	Higher Quality
58	Little Black Slough – Belknap	IDNR	2019	3	Higher Quality
68	Big Cypress	IDNR	2019	3	Higher Quality
70	Vienna Correctional Center	IDOC	2019	3	Higher Quality
72	Vienna Correctional Center	IDOC	2019	3	Higher Quality
74	Vienna Correctional Center	IDOC	2019	3	Higher Quality

77	Vienna Correctional Center	IDOC	2019	3	Higher Quality
78	Vienna Correctional Center	IDOC	2019	3	Higher Quality
1	Grantsburg North Swamp	USFS	2017	2	Intermediate Quality
3	Grantsburg South Swamp	USFS	2017	2	Intermediate Quality
4	Grantsburg South Swamp	USFS	2017	2	Intermediate Quality
10	Thorn Pond	IDNR	2017	2	Intermediate Quality
12	Little Black Slough - West	IDNR	2017	2	Intermediate Quality
15	Hogan's Bottoms - North	USFWS	2017	2	Intermediate Quality
16	Hogan's Bottoms - North	USFWS	2017	2	Intermediate Quality
17	Hogan's Bottoms - North	USFWS	2017	2	Intermediate Quality
20	Little Black Slough - North	IDNR	2017	2	Intermediate Quality
23	Fain Cemetery Swamp	IDNR	2017	2	Intermediate Quality
25	Deer Pond	IDNR	2017	2	Intermediate Quality
26	Mudline Flatwoods	USFWS	2018	2	Intermediate Quality
35	Tamms Pumphouse	USFWS	2018	2	Intermediate Quality
40	Clear Creek North	USFS	2018	2	Intermediate Quality
41	Union County Conservation Area	IDNR	2018	2	Intermediate Quality
42	Union County Conservation Area	IDNR	2018	2	Intermediate Quality
43	Union County Conservation Area	IDNR	2018	2	Intermediate Quality
48	LaRue Pine Hills - Winters Pond	USFS	2018	2	Intermediate Quality
50	LaRue Pine Hills - Winters Pond	USFS	2018	2	Intermediate Quality
53	Little Black Slough – Eden	IDNR	2019	2	Intermediate Quality
54	Little Black Slough – Eden	IDNR	2019	2	Intermediate Quality
55	Little Black Slough – Eden	IDNR	2019	2	Intermediate Quality
56	Little Black Slough – Belknap	IDNR	2019	2	Intermediate Quality
57	Little Black Slough – Belknap	IDNR	2019	2	Intermediate Quality
62	Mermet Swamp	IDNR	2019	2	Intermediate Quality
63	Mermet Swamp	IDNR	2019	2	Intermediate Quality
67	Big Cypress	IDNR	2019	2	Intermediate Quality

69	Vienna Correctional Center	IDOC	2019	2	Intermediate Quality
73	Vienna Correctional Center	IDOC	2019	2	Intermediate Quality
11	Thorn Pond	IDNR	2017	1	Lower Quality
27	Mudline Slough	USFWS	2018	1	Lower Quality
30	Horseshoe Ditch	IDNR	2018	1	Lower Quality
36	Clear Creek South	USFS	2018	1	Lower Quality
37	Clear Creek South	USFS	2018	1	Lower Quality
38	Clear Creek North	USFS	2018	1	Lower Quality
39	Clear Creek North	USFS	2018	1	Lower Quality
59	Tunnel Hill	IDNR	2019	1	Lower Quality
61	Mermet Swamp	IDNR	2019	1	Lower Quality
64	Mermet Swamp	IDNR	2019	1	Lower Quality
66	Mermet Swamp	IDNR	2019	1	Lower Quality
71	Vienna Correctional Center	IDOC	2019	1	Lower Quality
24	Deer Pond	IDNR	2017	0	Lower Quality
28	Unity INAI	IDNR	2018	0	Lower Quality
29	Unity INAI	IDNR	2018	0	Lower Quality
31	Horseshoe Ditch	IDNR	2018	0	Lower Quality
32	Cache Bend Slough	USFWS	2018	0	Lower Quality
33	Cache Bend Slough	USFWS	2018	0	Lower Quality
34	Tamms Pumphouse	USFWS	2018	0	Lower Quality
51	Cache Wetlands Center	IDNR	2019	0	Lower Quality
52	Cache Wetlands Center	IDNR	2019	0	Lower Quality
60	Tunnel Hill	IDNR	2019	0	Lower Quality
65	Mermet Swamp	IDNR	2019	0	Lower Quality

Table 8. **Overall herpetological species richness across 77 sampling sites in southern Illinois. The top 25 sites were ranked 'higher quality', the next 25 sites were ranked 'intermediate quality', and the lowest 27 sites were ranked 'lower quality'.**

Site Number	Site Name	Property Type	Year Sampled	Total Richness	Wetland Ranking
1	Grantsburg North Swamp	USFS	2017	20	Higher Quality
2	Grantsburg North Swamp	USFS	2017	19	Higher Quality
18	Watson Pond	IDNR	2017	19	Higher Quality
13	Little Black Slough - West	IDNR	2017	18	Higher Quality
57	Little Black Slough – Belknap	IDNR	2019	18	Higher Quality
14	Hogan's Bottoms - South	USFWS	2017	17	Higher Quality
71	Vienna Correctional Center	IDOC	2019	17	Higher Quality
75	Vienna Correctional Center	IDOC	2019	17	Higher Quality
5	Grantsburg South Swamp	USFS	2017	16	Higher Quality
8	Sugar Bottoms Swamp	USFS	2017	16	Higher Quality
12	Little Black Slough - West	IDNR	2017	16	Higher Quality
22	Fain Cemetery Swamp	IDNR	2017	16	Higher Quality
6	Renshaw Swamp	USFS	2017	15	Higher Quality
9	Sugar Bottoms Swamp	USFS	2017	15	Higher Quality
23	Fain Cemetery Swamp	IDNR	2017	15	Higher Quality
53	Little Black Slough – Eden	IDNR	2019	15	Higher Quality
68	Big Cypress	IDNR	2019	15	Higher Quality
74	Vienna Correctional Center	IDOC	2019	15	Higher Quality
78	Vienna Correctional Center	IDOC	2019	15	Higher Quality
4	Grantsburg South Swamp	USFS	2017	14	Higher Quality
7	Renshaw Swamp	USFS	2017	14	Higher Quality
17	Hogan's Bottoms - North	USFWS	2017	14	Higher Quality
26	Mudline Flatwoods	USFWS	2018	14	Higher Quality
54	Little Black Slough – Eden	IDNR	2019	14	Higher Quality

72	Vienna Correctional Center	IDOC	2019	14	Higher Quality
77	Vienna Correctional Center	IDOC	2019	14	Intermediate Quality
10	Thorn Pond	IDNR	2017	13	Intermediate Quality
11	Thorn Pond	IDNR	2017	13	Intermediate Quality
16	Hogan's Bottoms - North	USFWS	2017	13	Intermediate Quality
19	Watson Pond	IDNR	2017	13	Intermediate Quality
20	Little Black Slough - North	IDNR	2017	13	Intermediate Quality
25	Deer Pond	IDNR	2017	13	Intermediate Quality
43	Union County Conservation Area	IDNR	2018	13	Intermediate Quality
58	Little Black Slough – Belknap	IDNR	2019	13	Intermediate Quality
64	Mermet Swamp	IDNR	2019	13	Intermediate Quality
69	Vienna Correctional Center	IDOC	2019	13	Intermediate Quality
70	Vienna Correctional Center	IDOC	2019	13	Intermediate Quality
73	Vienna Correctional Center	IDOC	2019	13	Intermediate Quality
3	Grantsburg South Swamp	USFS	2017	12	Intermediate Quality
21	Little Black Slough - North	IDNR	2017	12	Intermediate Quality
35	Tamms Pumphouse	USFWS	2018	12	Intermediate Quality
41	Union County Conservation Area	IDNR	2018	12	Intermediate Quality
42	Union County Conservation Area	IDNR	2018	12	Intermediate Quality
44	LaRue Pine Hills - Otter Pond	SIUC	2018	12	Intermediate Quality
45	LaRue Pine Hills - Otter Pond	USFS	2018	12	Intermediate Quality
55	Little Black Slough – Eden	IDNR	2019	12	Intermediate Quality
66	Mermet Swamp	IDNR	2019	12	Intermediate Quality
46	LaRue Pine Hills - Otter Pond	USFS	2018	11	Intermediate Quality
47	LaRue Pine Hills - Winters Pond	USFS	2018	11	Intermediate Quality
62	Mermet Swamp	IDNR	2019	11	Intermediate Quality
29	Unity INAI	IDNR	2018	10	Lower Quality
36	Clear Creek South	USFS	2018	10	Lower Quality
37	Clear Creek South	USFS	2018	10	Lower Quality

39	Clear Creek North	USFS	2018	10	Lower Quality
50	LaRue Pine Hills - Winters Pond	USFS	2018	10	Lower Quality
63	Mermet Swamp	IDNR	2019	10	Lower Quality
15	Hogan's Bottoms - North	USFWS	2017	9	Lower Quality
24	Deer Pond	IDNR	2017	9	Lower Quality
27	Mudline Slough	USFWS	2018	9	Lower Quality
28	Unity INAI	IDNR	2018	9	Lower Quality
34	Tamms Pumphouse	USFWS	2018	9	Lower Quality
48	LaRue Pine Hills - Winters Pond	USFS	2018	9	Lower Quality
49	LaRue Pine Hills - Winters Pond	USFS	2018	9	Lower Quality
59	Tunnel Hill	IDNR	2019	9	Lower Quality
32	Cache Bend Slough	USFWS	2018	8	Lower Quality
38	Clear Creek North	USFS	2018	8	Lower Quality
40	Clear Creek North	USFS	2018	8	Lower Quality
51	Cache Wetlands Center	IDNR	2019	8	Lower Quality
52	Cache Wetlands Center	IDNR	2019	8	Lower Quality
56	Little Black Slough – Belknap	IDNR	2019	8	Lower Quality
61	Mermet Swamp	IDNR	2019	8	Lower Quality
30	Horseshoe Ditch	IDNR	2018	7	Lower Quality
31	Horseshoe Ditch	IDNR	2018	7	Lower Quality
60	Tunnel Hill	IDNR	2019	7	Lower Quality
65	Mermet Swamp	IDNR	2019	7	Lower Quality
33	Cache Bend Slough	USFWS	2018	6	Lower Quality
67	Big Cypress	IDNR	2019	6	Lower Quality

Table 9. Amphibian SGCN presence at sampling sites in southern Illinois (2017–2019).

Site Number	Site Name	*A. talpoideum*	*H. avivoca*	*N. viridescens*	*S. intermedia*
1	Grantsburg North Swamp	1	1	1	0
2	Grantsburg North Swamp	1	1	1	1
3	Grantsburg South Swamp	0	1	1	0
4	Grantsburg South Swamp	0	1	1	0
5	Grantsburg South Swamp	0	1	1	1
6	Renshaw Swamp	0	1	1	0
7	Renshaw Swamp	1	1	1	1
8	Sugar Bottoms Swamp	1	1	1	1
9	Sugar Bottoms Swamp	1	1	1	1
10	Thorn Pond	1	1	1	0
11	Thorn Pond	1	0	1	0
12	Little Black Slough - West	1	1	1	0
13	Little Black Slough - West	1	1	1	1
14	Hogan's Bottoms - South	1	1	0	1
15	Hogan's Bottoms - North	0	1	0	1
16	Hogan's Bottoms - North	1	1	0	1
17	Hogan's Bottoms - North	0	1	0	1
18	Watson Pond	0	1	1	1
19	Watson Pond	0	1	1	1
20	Little Black Slough - North	1	1	0	1
21	Little Black Slough - North	0	1	1	1
22	Fain Cemetery Swamp	1	1	0	1
23	Fain Cemetery Swamp	0	1	0	1
24	Deer Pond	1	0	0	0
25	Deer Pond	1	1	0	0
26	Mudline Flatwoods	1	0	0	1

27	Mudline Slough	0	0	0	0
28	Unity INAI	0	0	0	0
29	Unity INAI	0	0	0	0
30	Horseshoe Ditch	0	0	0	0
31	Horseshoe Ditch	0	0	0	0
32	Cache Bend Slough	0	0	0	0
33	Cache Bend Slough	0	0	0	0
34	Tamms Pumphouse	0	0	0	0
35	Tamms Pumphouse	0	0	0	1
36	Clear Creek South	0	0	0	1
37	Clear Creek South	0	0	0	1
38	Clear Creek North	0	0	0	1
39	Clear Creek North	0	0	0	1
40	Clear Creek North	0	0	0	1
41	Union County Conservation Area	0	0	1	1
42	Union County Conservation Area	0	0	1	1
43	Union County Conservation Area	1	0	1	1
44	LaRue Pine Hills - Otter Pond	1	1	0	1
45	LaRue Pine Hills - Otter Pond	0	1	1	0
46	LaRue Pine Hills - Otter Pond	0	1	1	0
47	LaRue Pine Hills - Winters Pond	0	1	1	0
48	LaRue Pine Hills - Winters Pond	0	1	1	0
49	LaRue Pine Hills - Winters Pond	0	1	1	1
50	LaRue Pine Hills - Winters Pond	0	0	1	1
51	Cache Wetlands Center	0	0	0	0
52	Cache Wetlands Center	0	0	0	0
53	Little Black Slough – Eden	1	1	1	0
54	Little Black Slough – Eden	1	1	1	0
55	Little Black Slough – Eden	1	1	1	0

56	Little Black Slough – Belknap	0	1	1	0
57	Little Black Slough – Belknap	1	1	1	0
58	Little Black Slough – Belknap	0	1	1	1
59	Tunnel Hill	0	0	0	1
60	Tunnel Hill	0	0	0	0
61	Mermet Flatwoods	0	0	0	1
62	Mermet Flatwoods	1	0	0	1
63	Mermet Swamp – NP	0	0	0	1
64	Mermet Swamp – NP	0	0	0	1
65	Mermet Swamp	0	0	0	0
66	Mermet Swamp	1	0	0	0
67	Big Cypress	0	0	0	1
68	Big Cypress	1	1	1	1
69	Vienna Correctional Center	0	1	1	0
70	Vienna Correctional Center	0	1	1	0
71	Vienna Correctional Center	1	0	0	0
72	Vienna Correctional Center	1	1	1	0
73	Vienna Correctional Center	1	1	0	1
74	Vienna Correctional Center	1	1	0	1
75	Vienna Correctional Center	1	1	1	1
77	Vienna Correctional Center	0	1	0	0
78	Vienna Correctional Center	0	1	1	1

Table 10. Reptile SGCN presence at sampling sites in southern Illinois (2017–2019).

Site Number	Site Name	*F. abacura*	*K. subrubrum*	*N. cyclopion*	*N. e. neglecta*	*T. carolina*	*T. sauritus*
1	Grantsburg North Swamp	0	0	0	0	0	0
2	Grantsburg North Swamp	0	0	0	0	0	0
3	Grantsburg South Swamp	0	0	0	0	0	0
4	Grantsburg South Swamp	0	0	0	0	0	0
5	Grantsburg South Swamp	0	1	0	0	0	0
6	Renshaw Swamp	0	0	0	1	1	1
7	Renshaw Swamp	0	0	0	0	0	0
8	Sugar Bottoms Swamp	0	1	0	0	1	0
9	Sugar Bottoms Swamp	0	1	0	0	0	0
10	Thorn Pond	0	1	0	0	0	0
11	Thorn Pond	0	1	0	0	0	0
12	Little Black Slough - West	0	0	0	0	0	0
13	Little Black Slough - West	0	1	0	0	0	0
14	Hogan's Bottoms - South	1	1	0	1	1	0
15	Hogan's Bottoms - North	0	1	0	0	0	0
16	Hogan's Bottoms - North	0	1	0	0	0	0
17	Hogan's Bottoms - North	0	1	0	0	0	0
18	Watson Pond	1	0	0	1	1	0
19	Watson Pond	0	0	0	0	0	0
20	Little Black Slough - North	0	1	0	0	0	0
21	Little Black Slough - North	0	0	0	0	0	0
22	Fain Cemetery Swamp	0	1	0	1	1	0
23	Fain Cemetery Swamp	0	1	0	0	0	0
24	Deer Pond	0	1	0	0	0	0
25	Deer Pond	0	1	0	0	1	0
26	Mudline Flatwoods	0	0	0	1	1	0

27	Mudline Slough	0	0	0	0	1	0
28	Unity INAI	0	0	0	0	0	0
29	Unity INAI	0	0	0	0	0	0
30	Horseshoe Ditch	1	0	0	0	0	0
31	Horseshoe Ditch	0	0	0	0	0	0
32	Cache Bend Slough	0	0	0	0	0	0
33	Cache Bend Slough	0	0	0	0	0	0
34	Tamms Pumphouse	0	0	0	0	0	0
35	Tamms Pumphouse	1	0	0	0	0	0
36	Clear Creek South	0	0	0	0	0	0
37	Clear Creek South	0	0	0	1	0	0
38	Clear Creek North	0	0	0	0	0	0
39	Clear Creek North	0	0	0	0	0	0
40	Clear Creek North	1	0	0	0	0	0
41	Union County Conservation Area	0	0	0	0	0	0
42	Union County Conservation Area	0	0	0	0	0	0
43	Union County Conservation Area	0	0	0	0	0	0
44	LaRue Pine Hills - Otter Pond	0	0	1	0	0	0
45	LaRue Pine Hills - Otter Pond	1	0	0	0	0	0
46	LaRue Pine Hills - Otter Pond	0	0	1	0	0	0
47	LaRue Pine Hills - Winters Pond	0	0	1	0	0	0
48	LaRue Pine Hills - Winters Pond	0	0	0	0	0	0
49	LaRue Pine Hills - Winters Pond	0	0	0	0	0	0
50	LaRue Pine Hills - Winters Pond	0	0	0	0	0	0
51	Cache Wetlands Center	0	0	0	0	0	0
52	Cache Wetlands Center	0	0	0	0	0	0
53	Little Black Slough – Eden	0	0	0	0	0	0
54	Little Black Slough – Eden	0	1	0	0	0	0
55	Little Black Slough – Eden	0	0	0	0	0	0

56	Little Black Slough – Belknap	0	0	0	0	0	0
57	Little Black Slough – Belknap	0	1	0	1	0	0
58	Little Black Slough – Belknap	0	0	0	1	0	0
59	Tunnel Hill	0	0	0	0	0	0
60	Tunnel Hill	0	0	0	0	0	0
61	Mermet Swamp	0	0	0	0	0	0
62	Mermet Swamp	0	0	0	0	1	0
63	Mermet Swamp	1	0	0	0	0	0
64	Mermet Swamp	0	1	0	1	0	0
65	Mermet Swamp	0	0	0	0	0	0
66	Mermet Swamp	0	0	0	0	1	0
67	Big Cypress	0	0	0	0	1	0
68	Big Cypress	0	0	0	0	0	0
69	Vienna Correctional Center	0	0	0	1	0	0
70	Vienna Correctional Center	0	0	0	0	1	0
71	Vienna Correctional Center	0	0	0	0	1	0
72	Vienna Correctional Center	0	0	0	0	1	0
73	Vienna Correctional Center	0	0	0	0	0	0
74	Vienna Correctional Center	0	0	0	1	1	0
75	Vienna Correctional Center	0	0	0	1	1	0
77	Vienna Correctional Center	1	0	0	0	1	0
78	Vienna Correctional Center	0	0	0	0	0	0

Table 11. Capture data summary for all endangered and threatened species encountered during site sampling in southern Illinois (2017–2019).

Site Number	Latitude	Longitude	Species	Minnow Trap	Turtle Trap	Observation	Pipe Trap New	Pipe Trap Recap
1	37.40627	-88.74111	*Hyla avivoca*			Calling	26	17
2	37.40645	-88.74034	*Hyla avivoca*				12	11
3	37.38980	-88.73080	*Hyla avivoca*			Calling	4	5
4	37.39039	-88.72879	*Hyla avivoca*				3	5
5	37.39091	-88.72660	*Hyla avivoca*			Calling	14	9
6	37.35540	-88.69106	*Hyla avivoca*			Calling	8	7
6	37.35540	-88.69106	*Thamnophis sauritus*			1		
7	37.35537	-88.68877	*Hyla avivoca*			Calling	10	7
8	37.34349	-88.70156	*Hyla avivoca*				4	4
9	37.34357	-88.70040	*Hyla avivoca*			Calling	8	5
10	37.33707	-88.92447	*Hyla avivoca*				1	0
12	37.35424	-89.01071	*Hyla avivoca*			Calling	8	7
13	37.35486	-89.01102	*Hyla avivoca*				10	10
14	37.36335	-89.07008	*Hyla avivoca*				8	4
15	37.37217	-89.07656	*Hyla avivoca*			Calling	8	7
16	37.37318	-89.07643	*Hyla avivoca*				6	5
17	37.37370	-89.07563	*Hyla avivoca*				3	6
18	37.37422	-88.93023	*Hyla avivoca*			Calling	3	3
19	37.37414	-88.92839	*Hyla avivoca*			Calling	6	3
20	37.36911	-88.98293	*Hyla avivoca*			Calling	5	4
21	37.36993	-88.98081	*Hyla avivoca*			Calling	2	1
22	37.39195	-88.98436	*Hyla avivoca*			Calling	1	1
23	37.39378	-88.98402	*Hyla avivoca*			Calling	1	1
25	37.43037	-88.93647	*Hyla avivoca*			Calling	0	0

44	37.54039	-89.43859	*Hyla avivoca*				3	0
44	37.54039	-89.43859	*Nerodia cyclopion*		2			
45	37.54141	-89.43934	*Hyla avivoca*				2	1
46	37.54604	-89.44009	*Nerodia cyclopion*	1	2			
46	37.54604	-89.44009	*Hyla avivoca*				3	3
47	37.58100	-89.44968	*Nerodia cyclopion*		1			
47	37.58100	-89.44968	*Hyla avivoca*				7	8
48	37.58089	-89.45035	*Hyla avivoca*				9	6
49	37.58108	-89.45077	*Hyla avivoca*				4	3
53	37.33870	-88.96978	*Hyla avivoca*			Calling	12	19
54	37.33753	-88.96827	*Hyla avivoca*				16	19
55	37.33946	-88.96785	*Hyla avivoca*				8	6
56	37.34730	-88.95883	*Hyla avivoca*			Calling	9	11
57	37.34623	-88.95735	*Hyla avivoca*			Calling	7	7
58	37.34749	-88.95650	*Hyla avivoca*				8	6
68	37.31392	-88.98571	*Hyla avivoca*				1	1
69	37.40526	-88.75666	*Hyla avivoca*				11	10
70	37.40646	-88.75776	*Hyla avivoca*				2	2
72	37.41666	-88.77059	*Hyla avivoca*			Calling	4	5
73	37.41680	-88.76853	*Hyla avivoca*	1			4	3
74	37.41672	-88.76519	*Hyla avivoca*				6	1
75	37.43592	-88.76419	*Hyla avivoca*				1	0
77	37.40722	-88.75382	*Hyla avivoca*			Calling	14	15
78	37.40889	-88.75440	*Hyla avivoca*			Calling	23	23

Table 12. Recommended priority monitoring sites for amphibian and reptile SGCN in southern Illinois swamps.

Site Number	Site Name	Property Type	Year Sampled	Latitude	Longitude	2015 SGCN Richness	Total Richness
18	Watson Pond	IDNR	2017	37.37422	-88.93023	5	19
6	Renshaw Swamp	USFS	2017	37.35540	-88.69106	4	15
8	Sugar Bottoms Swamp	USFS	2017	37.34349	-88.70156	4	16
14	Hogan's Bottoms - South	USFWS	2017	37.36335	-89.07008	4	17
75	Vienna Correctional Center	IDOC	2019	37.43592	-88.76419	4	17
2	Grantsburg North Swamp	USFS	2017	37.40645	-88.74034	3	19
13	Little Black Slough - West	IDNR	2017	37.35486	-89.01102	3	18
5	Grantsburg South Swamp	USFS	2017	37.39091	-88.72660	3	16
22	Fain Cemetery Swamp	IDNR	2017	37.39195	-88.98436	3	16
68	Big Cypress	IDNR	2019	37.31392	-88.98571	3	15

Table 13. Amphibian and reptile SGCN (2015) and total richness of replicated sites in southern Illinois swamps.

Site Name	Sites	Property Type	Year Sampled	2015 SGCN Richness	Total Richness
Renshaw Swamp	6, 7	USFS	2017	5	18
LaRue Pine Hills - Otter Pond	44, 45, 46	USFS/SIUC	2018	5	17
Vienna Correctional Center – West	77, 78	IDOC	2019	5	20
Watson Pond	18, 19	IDNR	2017	5	22
Hogan's Bottoms	14, 15, 16, 17	USFWS	2017	4	23
Sugar Bottoms Swamp	8, 9	USFS	2017	4	18
Vienna Correctional Center – Tupelo	72, 73, 74, 75	IDOC	2019	4	23
Big Cypress	67 , 68	IDNR	2019	4	17
LaRue Pine Hills – Winters Pond	47, 48, 49, 50	USFS	2018	4	14
Fain Cemetery Swamp	22 23	IDNR	2017	3	19
Little Black Slough – Belknap	56, 57, 58	IDNR	2019	3	21
Little Black Slough - North	20, 21	IDNR	2017	3	16
Little Black Slough -West	12 , 13	IDNR	2017	3	22
Vienna Correctional Center – South	68, 69, 70	IDOC	2019	3	26
Grantsburg North Swamp	1, 2	USFS	2017	3	23
Grantsburg South Swamp	3, 4, 5	USFS	2017	3	19
Deer Pond	24, 25	IDNR	2017	2	13
Little Black Slough – Eden	53, 54, 55	IDNR	2019	2	18
Mermet Swamp – NP	63, 64	IDNR	2019	2	12
Mudline Swamp	26, 27	USFWS	2018	2	14
Thorn Pond	10, 11	IDNR	2017	2	14
Mermet Swamp – Flatwoods	61, 62	IDNR	2019	2	12
Union County Conservation Area	41, 43	IDNR	2018	2	17
Clear Creek North	38, 39, 40	USFS	2018	2	13
Tamms Pumphouse	34, 35	USFWS	2018	2	12

Clear Creek South	36, 37	USFS	2018	1	13
Mermet Swamp	65, 66	IDNR	2019	1	15
Horseshoe Ditch	30, 31	IDNR	2018	1	10
Tunnel Hill	59, 60	IDNR	2019	1	10
Cache Bend Slough	32, 33	USFWS	2018	0	8
Cache Wetlands Center	51, 52	IDNR	2019	0	8
Unity INAI	28, 29	IDNR	2018	0	12

Figures

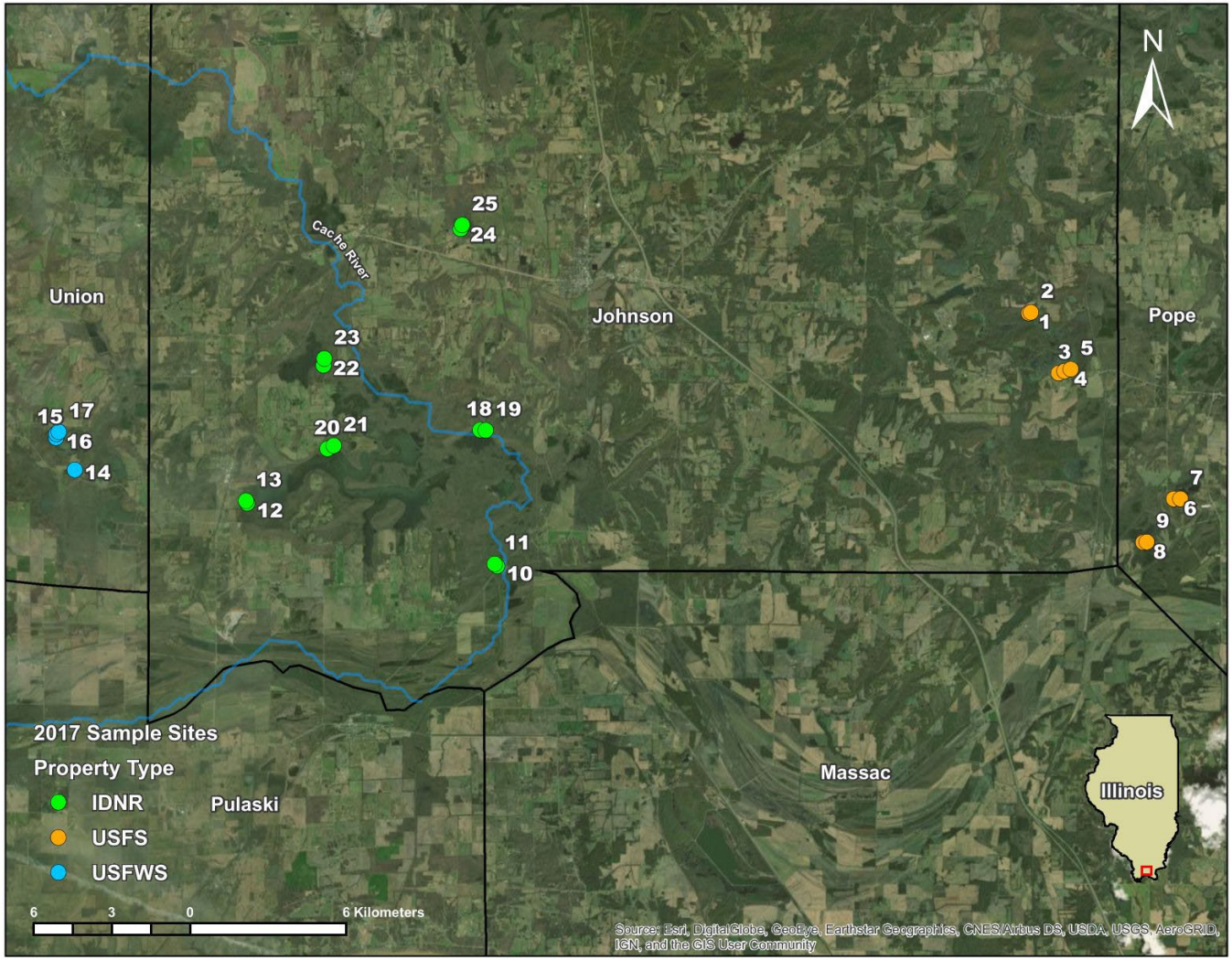

Figure 1. **2017 swamp sampling sites in southern Illinois; 25 sites sampled across nine properties. Numbers correspond to site location numbers in Table 1.**

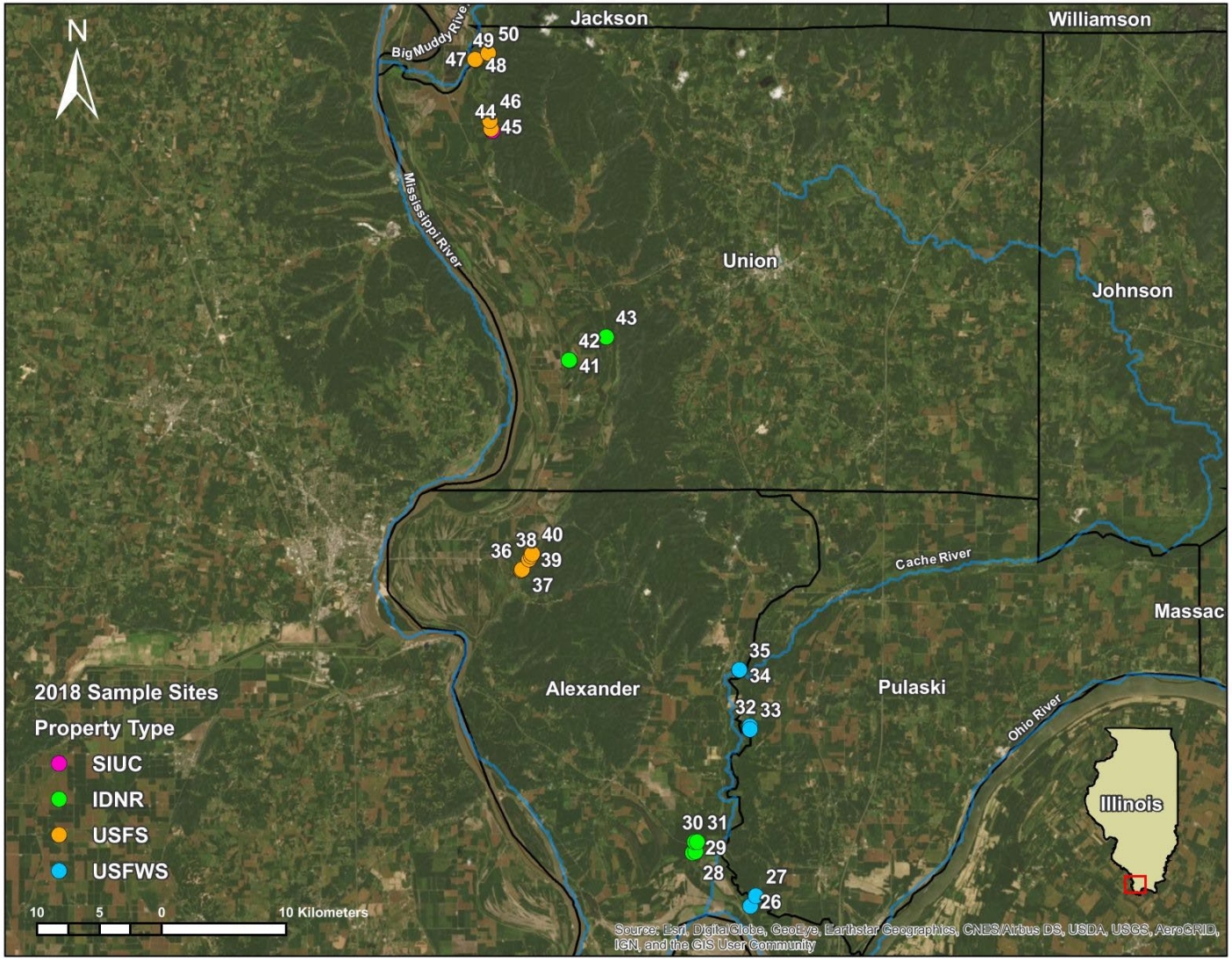

Figure 2. **2018 swamp sampling sites in southern Illinois; 25 sites sampled across 10 properties. Numbers correspond to site location numbers in Table 1.**

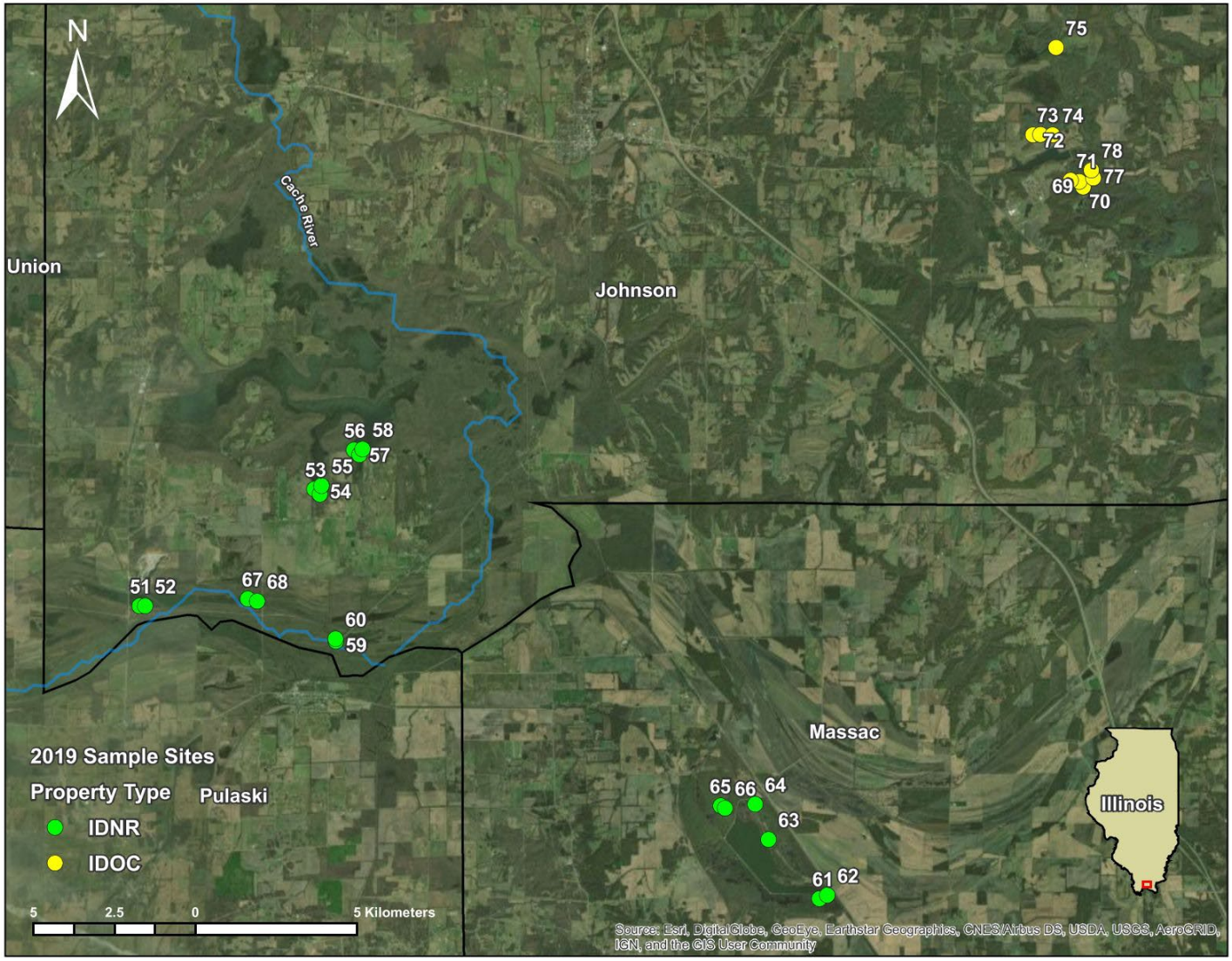

Figure 3. **2019 swamp sampling sites in southern Illinois; 27 sites sampled across seven properties. Numbers correspond to site location numbers in Table 1.**

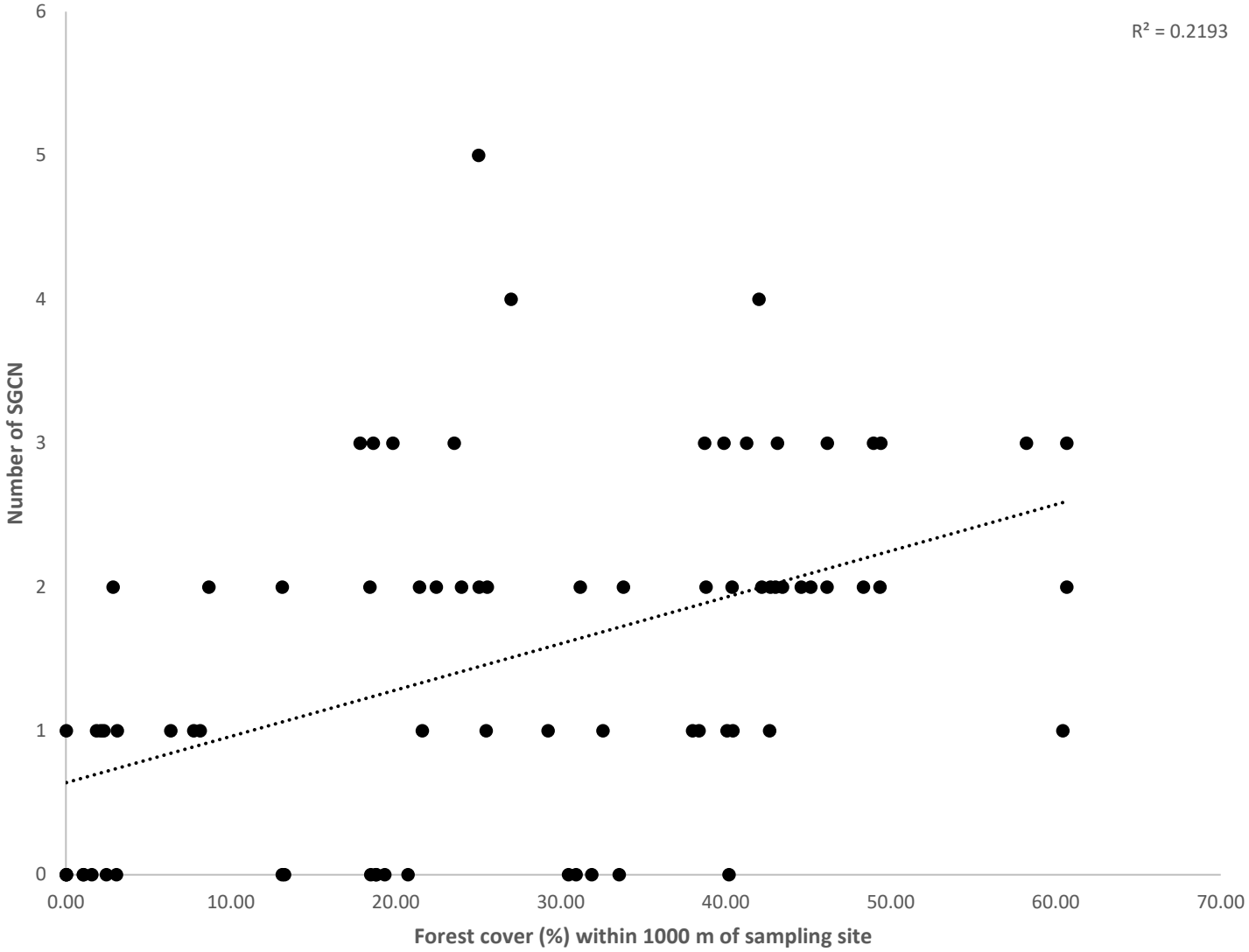

Figure 4. **Effect of forest cover on the number of SGCN (2005 list) found at sampling sites in southern Illinois.**

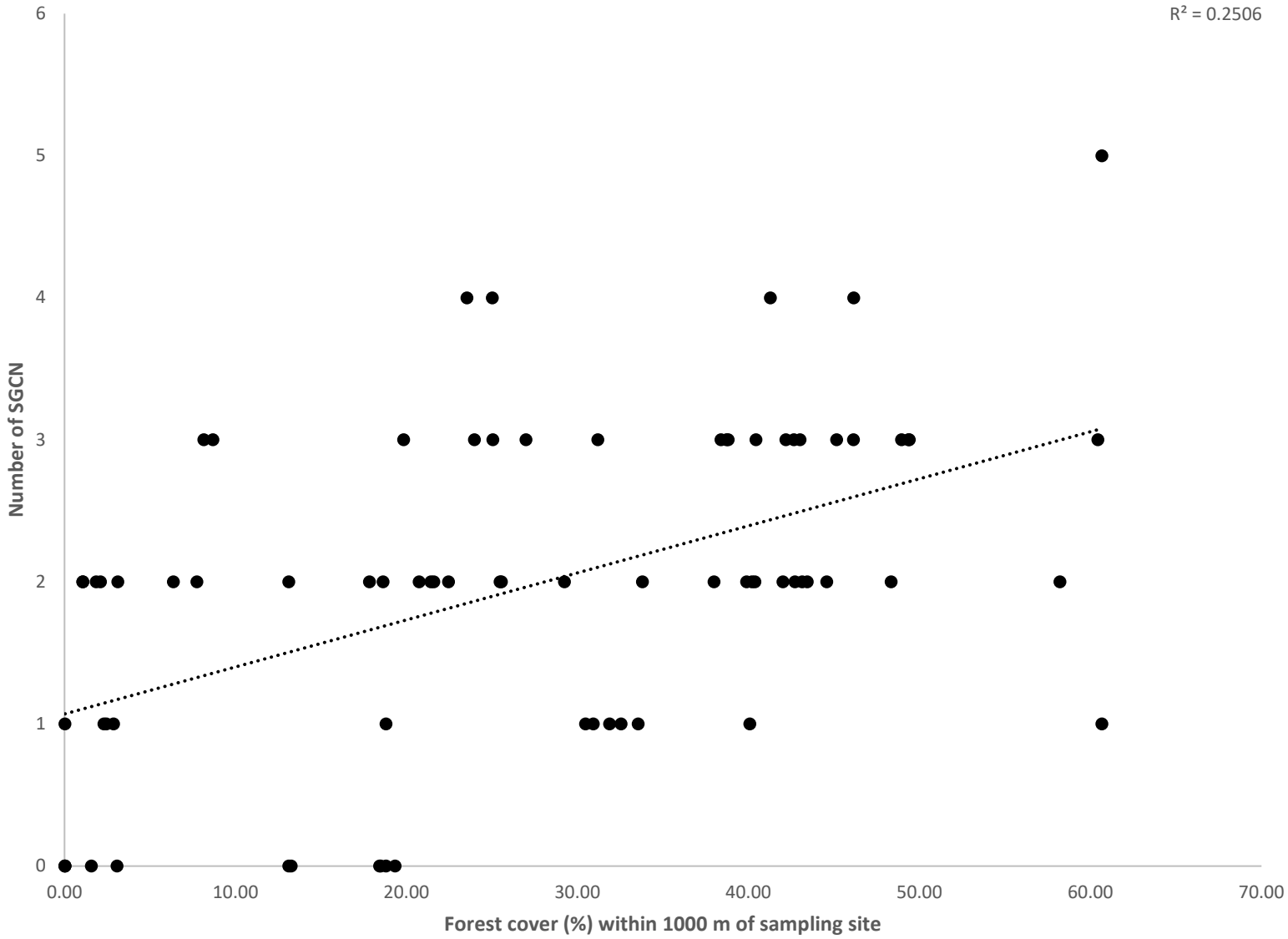

Figure 5. Effect of forest cover on the number of SGCN (2015 list) found at sampling sites in southern Illinois.

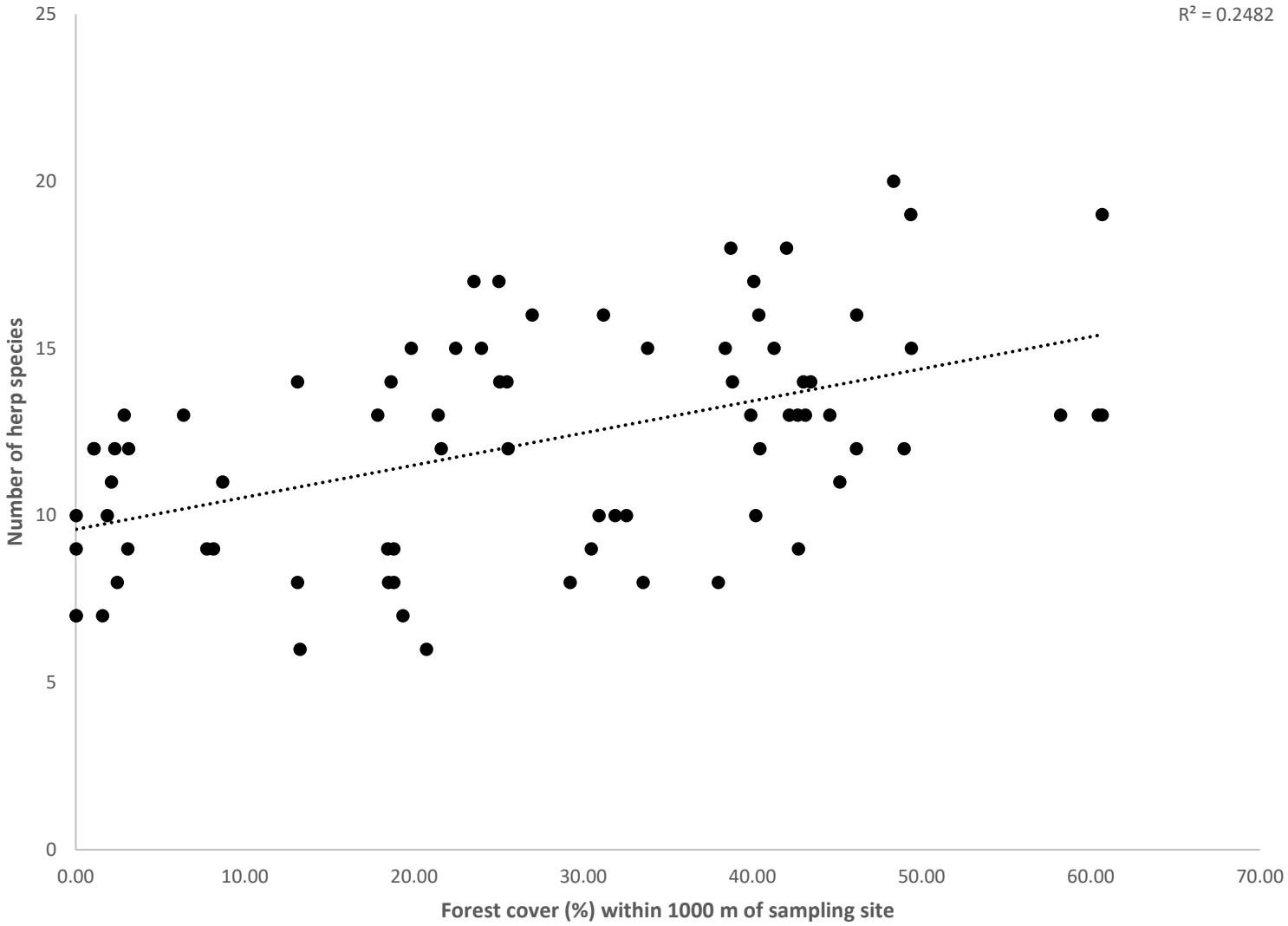

Figure 6. **Effect of forest cover on the total number of herp species found at sampling sites in southern Illinois.**

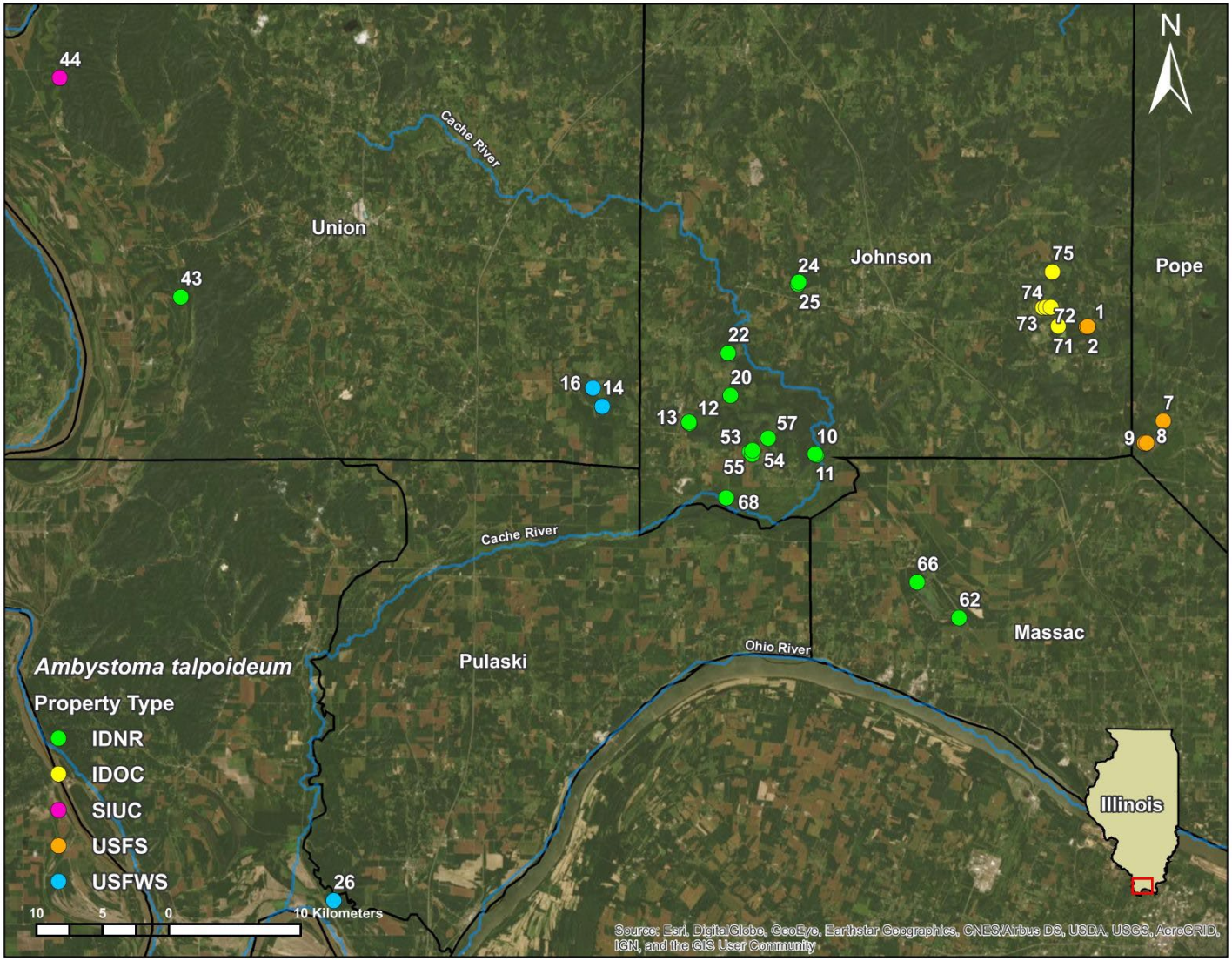

Figure 7. **Species presence map for *Ambystoma talpoideum* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

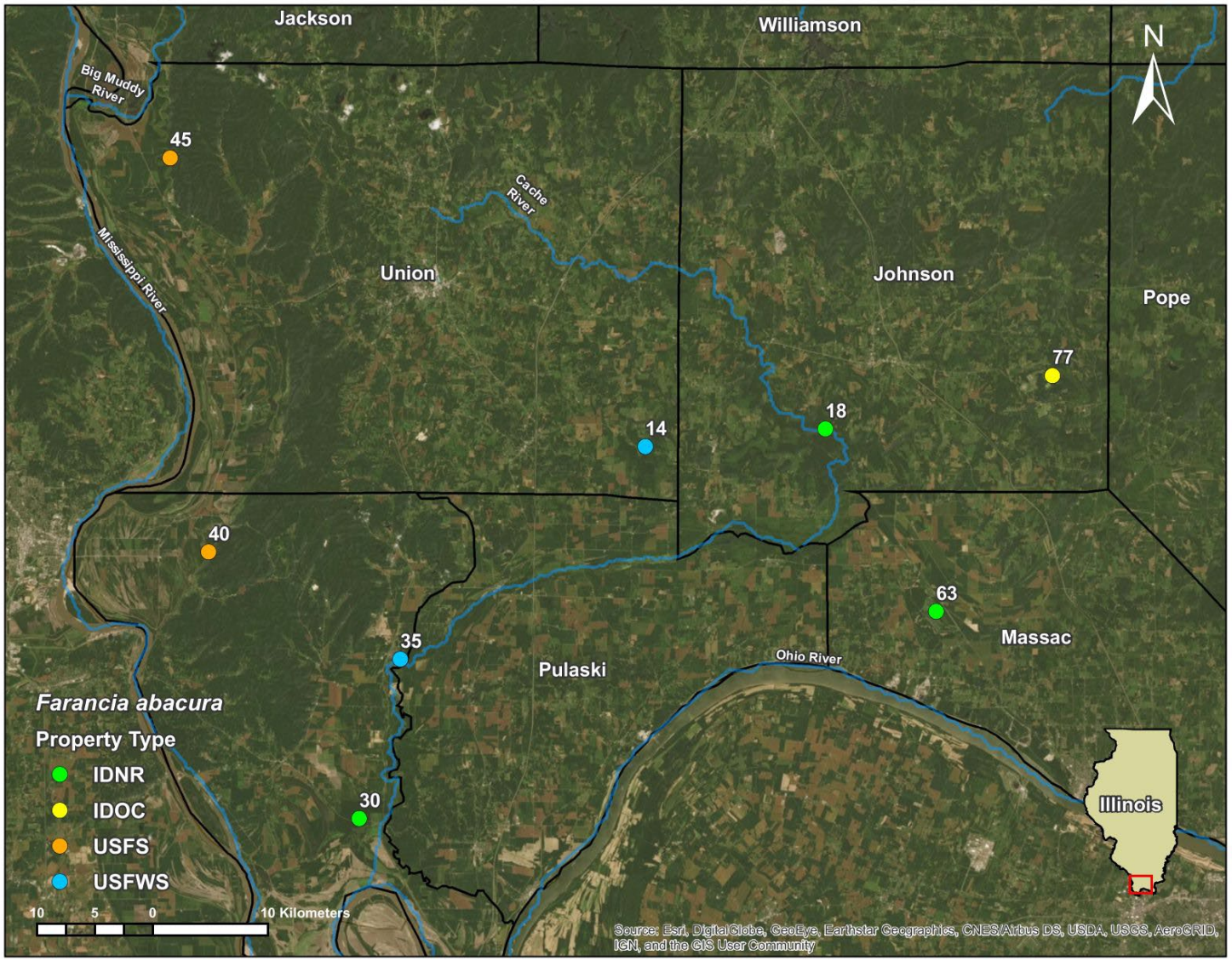

Figure 8. **Species presence map for *Farancia abacura* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

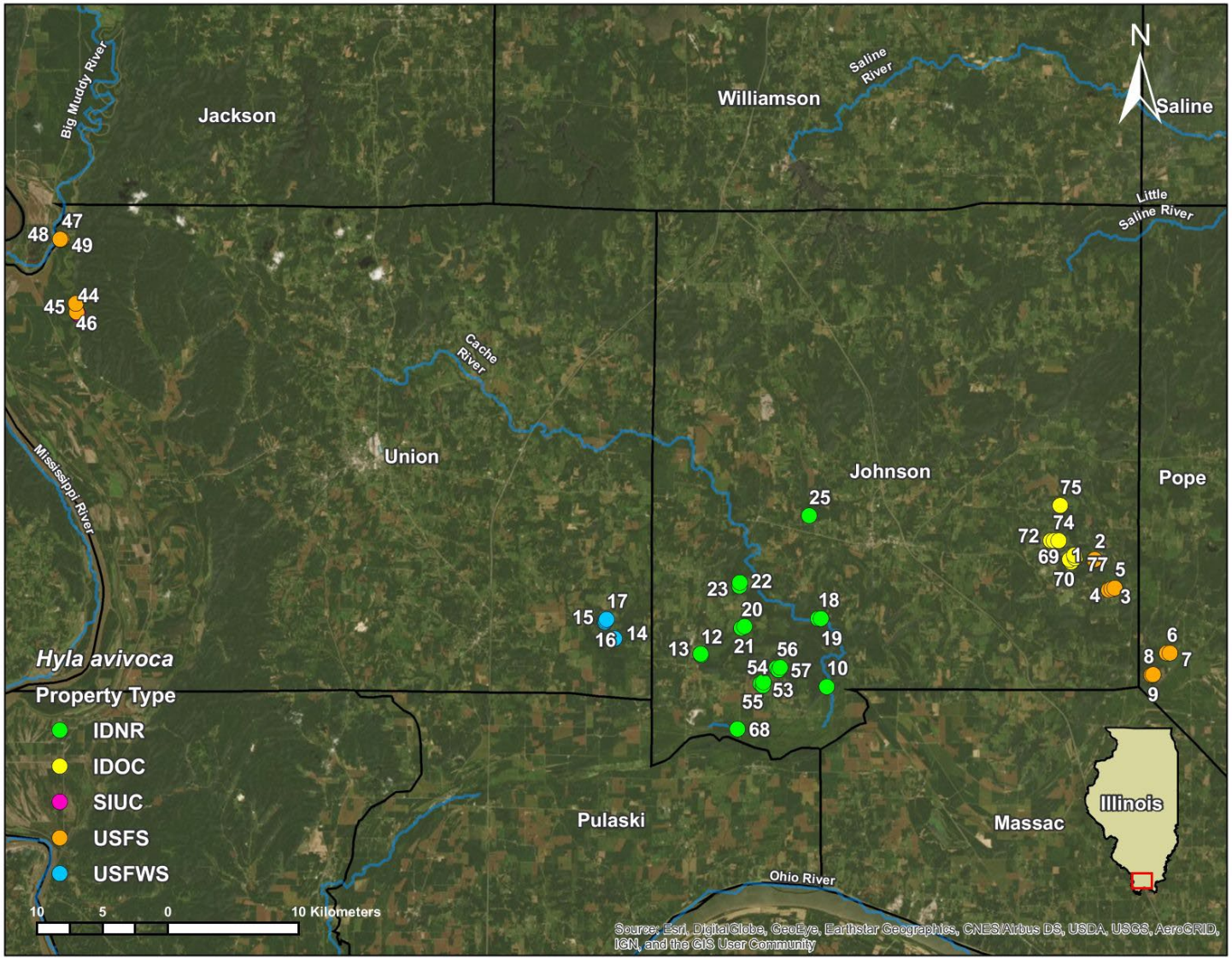

Figure 9. **Species presence map for *Hyla avivoca* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

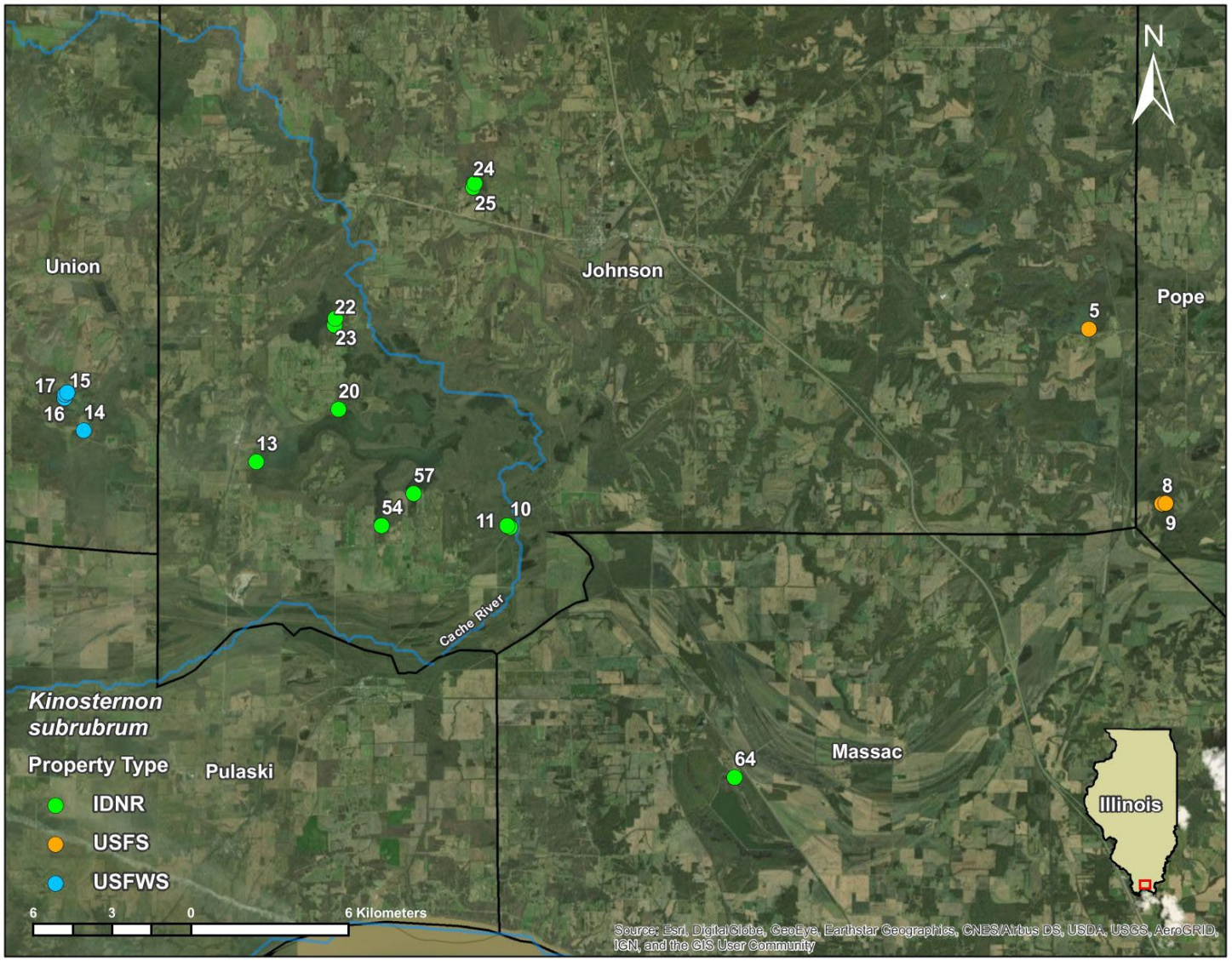

Figure 10. **Species presence map for *Kinosternon subrubrum* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

Figure 11. **Species presence map for *Nerodia cyclopion* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

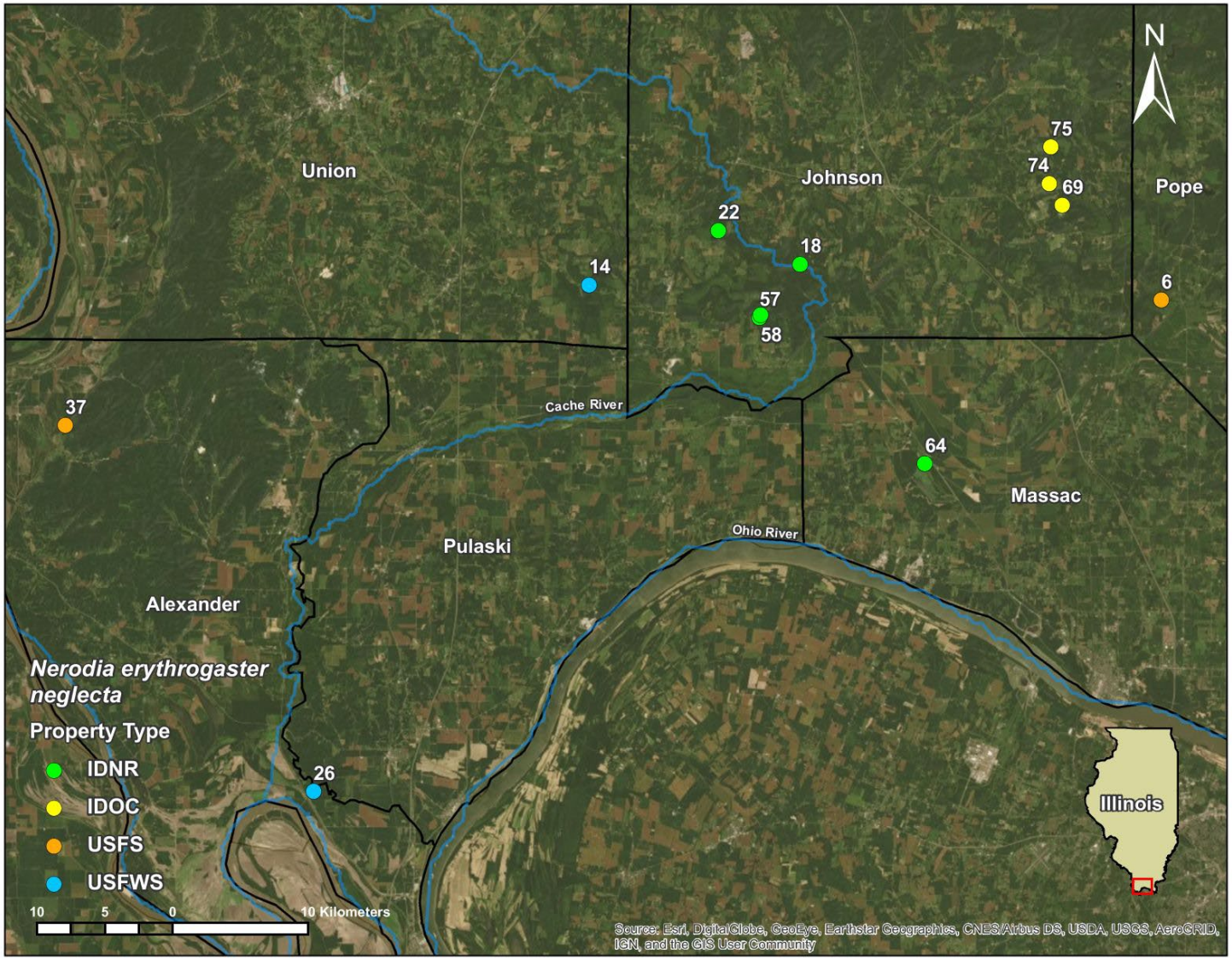

Figure 12. **Species presence map for *Nerodia erythrogaster neglecta* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

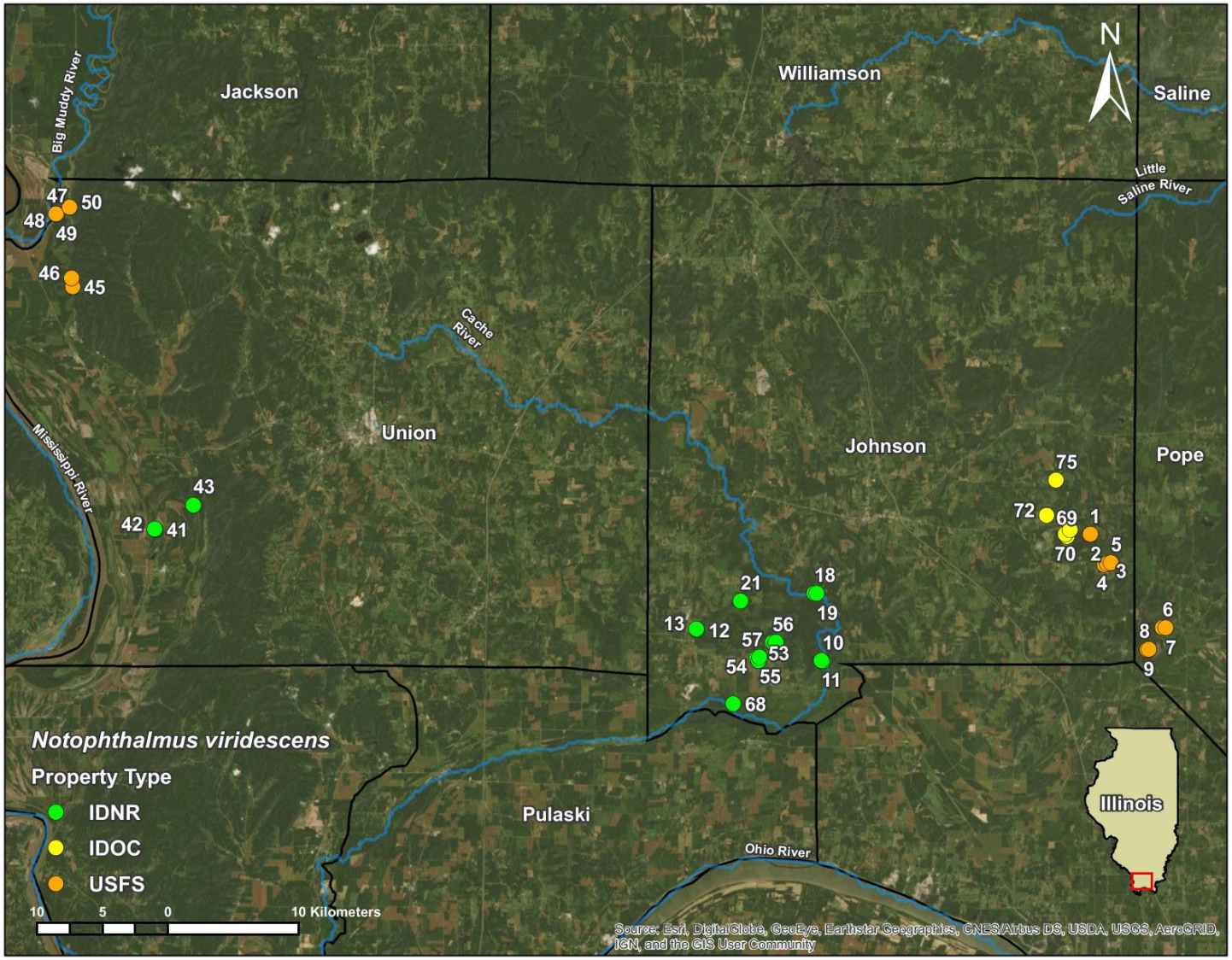

Figure 13. **Species presence map for *Notophthalmus viridescens* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

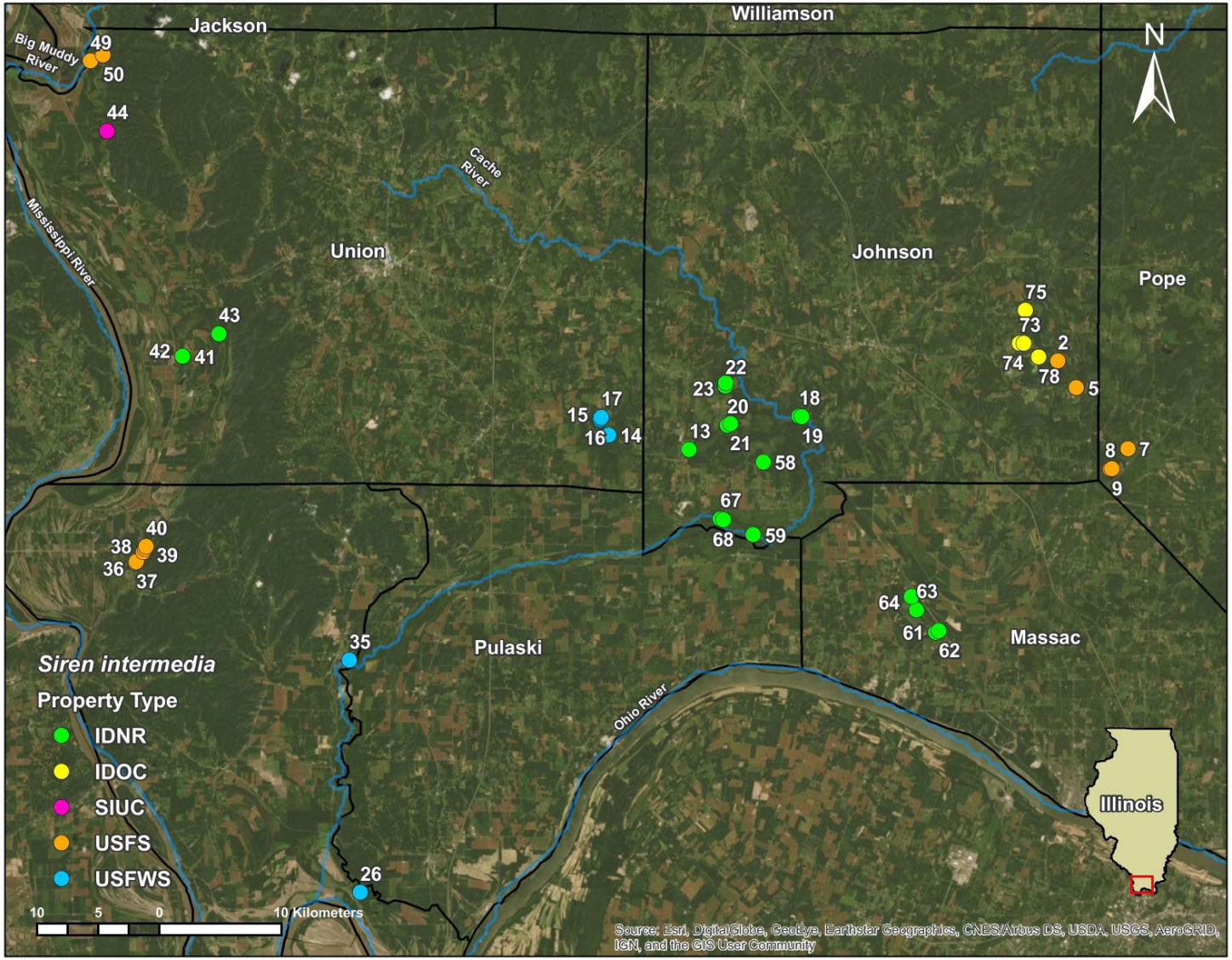

Figure 14. **Species presence map for *Siren intermedia* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

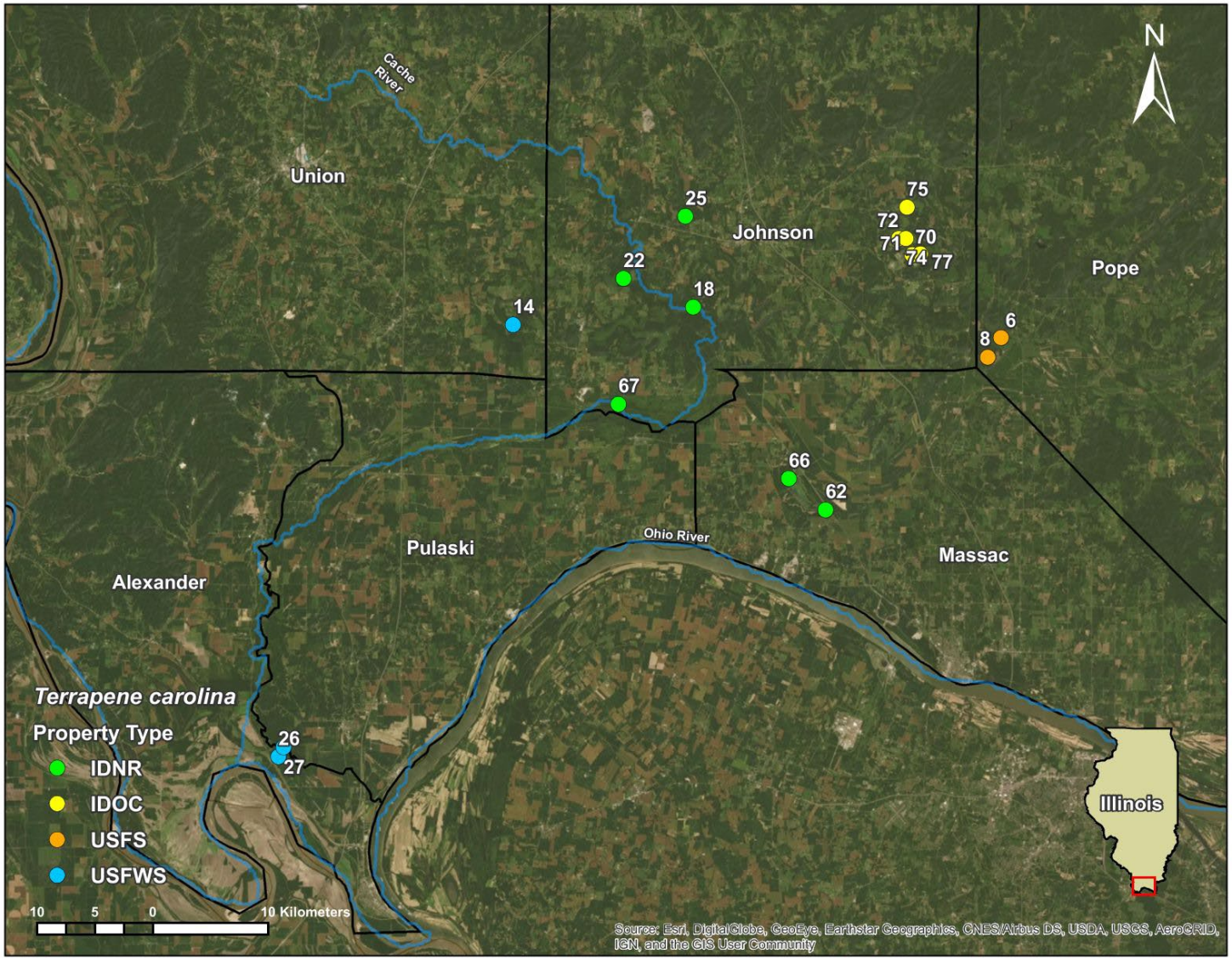

Figure 15. **Species presence map for *Terrapene carolina* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

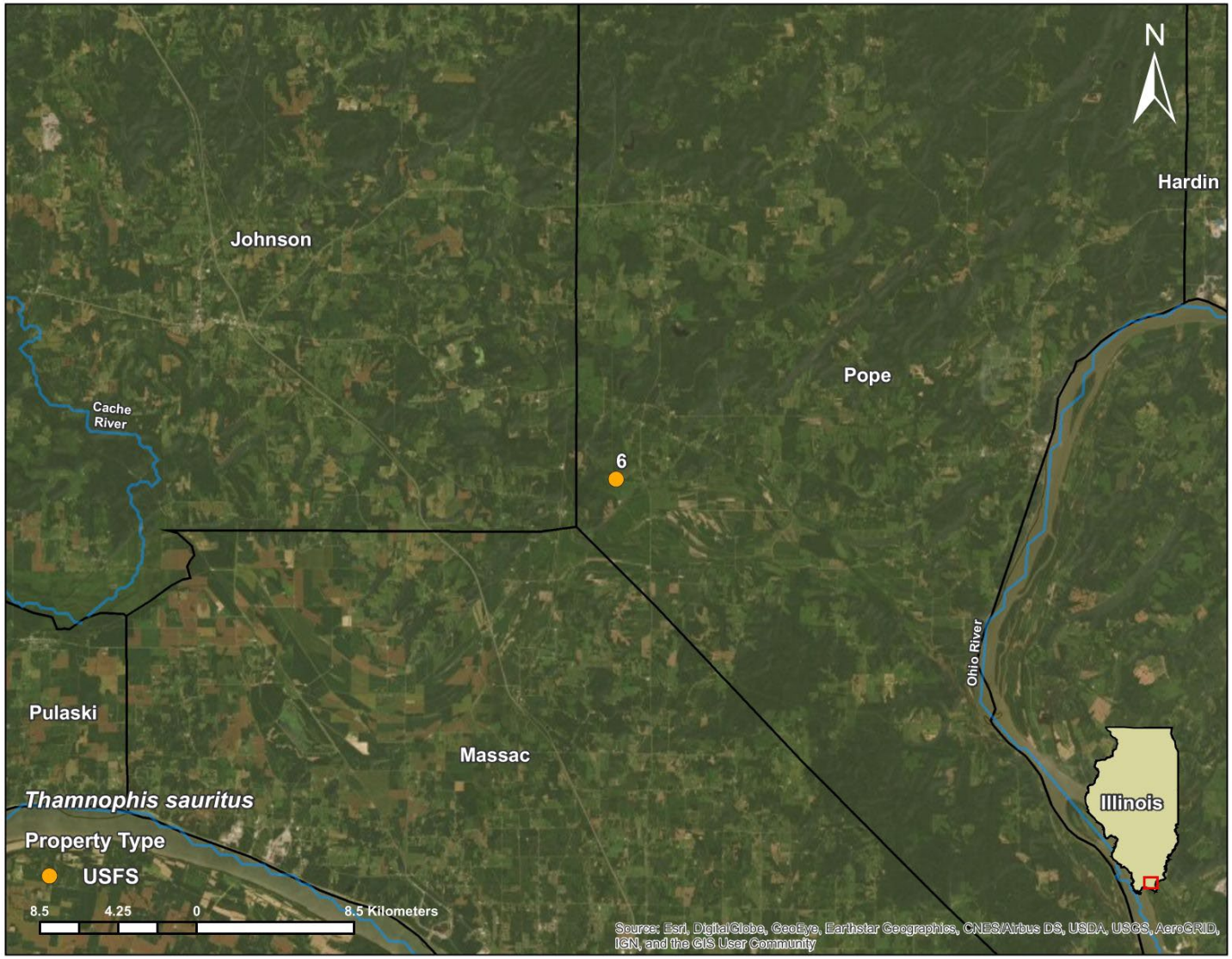

Figure 16. **Species presence map for *Thamnophis sauritus* from sampling sites in southern Illinois (2017–2019). Numbers correspond to site location numbers in Table 1.**

Appendix 1.

Supplemental Tables 1–77. Species occurrence and relative abundance for each site (separated by capture method). For observations, an X denotes species was observed at the site outside of the trapping methods detailed above. United States Forest Service (USFS) properties are highlighted in blue; United States Fish and Wildlife Service (USFWS) properties are highlighted in yellow; Illinois Department of Natural Resources (IDNR) properties are highlighted in gray; Illinois Department of Corrections (IDOC) properties are highlighted in green. In each table, amphibian species names are followed with an A or L to denote adult and larval captures.

Table 1. Grantsburg North (USFS) - Site 1

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Notophthalmus viridescens (A)	7					
Pseudacris crucifer (L)	2					
Rana catesbeiana (A)	7	2		X		
Rana catesbeiana (L)		2				
Rana clamitans (A)				X		
Rana clamitans (L)	17	15				
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	17	2				
Chelydra serpentina		1				
Agkistrodon piscivorus		8		X		
Acris blanchardi (A)				X		
Ambystoma opacum (A)				X		
Eurycea lucifuga (A)				X		
Hyla avivoca (A)				X	26	17
Hyla cinerea (A)				X	13	9
Hyla versicolor-chrysoscelis (A)				X	7	1
Plestiodon fasciatus				X		
Plethodon glutinosus (A)				X		
Ambystoma talpoideum (A)				X		

Ambystoma maculatum (A)	X
Sternotherus odoratus	X
Scincella barbouri	X
Pantherophis spiloides	X

Table 2. Grantsburg North (USFS) - Site 2

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Notophthalmus viridescens (A)	3					
Pseudacris crucifer (L)	2					
Rana clamitans (A)	12	2		X		
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	3					
Siren intermedia (A)	2	1				
Sternotherus odoratus	2			X		
Rana catesbeiana (A)		4		X		
Acris blanchardi (A)				X		
Ambystoma maculatum (A)				X		
Agkistrodon piscivorus				X		
Ambystoma talpoideum (A)				X		
Hyla avivoca (A)					12	11
Hyla cinerea (A)					11	12
Hyla versicolor-chrysoscelis (A)					4	4
Plethodon glutinosus (A)				X		
Scincella barbouri				X		
Sceloporus undulatus				X		
Trachemys scripta				X		
Chelydra serpentina				X		

Table 3. Grantsburg South (USFS) - Site 3

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Notophthalmus viridescens (A)	4					
Rana catesbeiana (A)	1	1		X		
Rana catesbeiana (L)	2		3			
Rana sphenocephala (A)		1		X		
Rana sphenocephala (L)	7	1				
Rana clamitans (A)				X		
Rana clamitans (L)		3				
Acris blanchardi (A)				X		
Agkistrodon piscivorus				X		
Chrysemys picta				X		
Hyla avivoca (A)				X	4	5
Hyla cinerea (A)				X	1	2
Hyla versicolor-chrysoscelis (A)				X	2	4
Eurycea lucifuga (A)				X		
Plethodon glutinosus (A)				X		

Table 4. Grantsburg South (USFS) - Site 4

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Notophthalmus viridescens (A)	1		1	X		
Rana catesbeiana (A)		1		X		
Rana catesbeiana (L)	9	1	1			
Rana clamitans (A)		1		X		
Rana clamitans (L)	6	5	4			
Rana sphenocephala (A)				X		
Acris blanchardi (A)				X		
Chelydra serpentina				X		
Eurycea lucifuga (A)				X		
Hyla avivoca (A)					3	5
Hyla cinerea (A)				X	4	3
Hyla versicolor-chrysoscelis (A)					5	2
Plethodon glutinosus (A)				X		
Plestiodon laticeps				X		
Ambystoma opacum (A)				X		
Agkistrodon piscivorus				X		

Table 5. Grantsburg South (USFS) - Site 5

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Acris blanchardi (A)	1			X		
Rana catesbeiana (L)	1	5	1			
Rana clamitans (A)	1	2		X		
Rana clamitans (L)	10	11	2			
Rana sphenocephala (A)	1			X		
Rana sphenocephala (L)	8	6				
Kinosternon subrubrum		1				
Siren intermedia (A)		1				
Agkistrodon piscivorus		1		X		
Coluber constrictor				X		
Eurycea lucifuga (A)				X		
Hyla avivoca (A)				X	14	9
Hyla cinerea (A)				X	1	1
Hyla versicolor-chrysoscelis (A)					8	4
Plethodon glutinosus (A)				X		
Sternotherus odoratus				X		
Notophthalmus viridescens (A)				X		
Ambystoma opacum (A)				X		

Table 6. Renshaw (USFS) - Site 6

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Notophthalmus viridescens (A)	3					
Rana catesbeiana (A)	4	12	2	X		
Rana catesbeiana (L)	17	43	2			
Rana clamitans (A)		4		X		
Rana clamitans (L)	44	13	4			
Rana sphenocephala (A)	1	1		X		
Rana sphenocephala (L)	43					
Nerodia erythrogaster neglecta	1	1				
Sternotherus odoratus		1		X		
Agkistrodon piscivorus		1		X		
Nerodia rhombifer		1				
Acris blanchardi (A)				X		
Anaxyrus americanus (A)				X		
Hyla avivoca (A)				X	8	7
Hyla cinerea (A)				X	0	0
Hyla versicolor-chrysoscelis (A)					9	1
Terrapene carolina				X		
Thamnophis sauritus				X		

Table 7. Renshaw (USFS) - Site 7

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (L)	1					
Notophthalmus viridescens (A)	5					
Rana catesbeiana (A)	17	11		X		
Rana catesbeiana (L)	23	59				
Rana clamitans (A)	1			X		
Rana clamitans (L)	37	51				
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	42					
Siren intermedia (A)	2					
Hyla avivoca (L)	1					
Hyla avivoca (A)				X	10	7
Hyla cinerea (A)				X	4	0
Hyla versicolor-chrysoscelis (A)					4	2
Nerodia erythrogaster	1					
Agkistrodon piscivorus		2				
Acris blanchardi (A)				X		
Anaxyrus americanus (A)				X		
Sternotherus odoratus				X		

Table 8. Sugar Bottoms (USFS) - Site 8

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	7					
Notophthalmus viridescens (A)	1			X		
Rana catesbeiana (A)	2			X		
Rana catesbeiana (L)	1	1				
Rana clamitans (A)	3	2		X		
Rana clamitans (L)	1	5				
Rana sphenocephala (A)	1	1		X		
Rana sphenocephala (L)	24	14				
Kinosternon subrubrum		4				
Siren intermedia (A)		6				
Agkistrodon piscivorus		1		X		
Agkistrodon contortrix				X		
Acris blanchardi (A)				X		
Plethodon glutinosus (A)				X		
Terrapene carolina				X		
Ambystoma opacum (A)				X		
Hyla avivoca (A)					4	4
Hyla cinerea (A)					4	3
Hyla versicolor-chrysoscelis (A)					7	4

Table 9. Sugar Bottoms (USFS) - Site 9

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	1					
Notophthalmus viridescens (A)	2			X		
Rana catesbeiana (A)	2	1				
Rana clamitans (A)				X		
Rana clamitans (L)	7	15				
Rana sphenocephala (A)	1			X		
Rana sphenocephala (L)	32	13				
Kinosternon subrubrum		5		X		
Siren intermedia (A)		2				
Agkistrodon piscivorus		4				
Acris blanchardi (A)				X		
Hyla avivoca (A)				X	8	5
Hyla cinerea (A)					1	2
Hyla versicolor-chrysoscelis (A)					7	4
Pseudacris crucifer (A)				X		
Ambystoma opacum (A)				X		
Pseudacris triseriata (A)				X		

Table 10. Thorn Pond (IDNR) - Site 10

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma maculatum (A)				X		
Ambystoma maculatum (L)	3					
Ambystoma opacum (A)				X		
Ambystoma opacum (L)	9					
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	4					
Notophthalmus viridescens (A)	3					
Rana catesbeiana (A)	2	3				
Rana catesbeiana (L)	58	46				
Rana clamitans (A)				X		
Rana clamitans (L)	14	15				
Rana sphenocephala (A)	1			X		
Chelydra serpentina	2					
Agkistrodon piscivorus		1				
Acris blanchardi (A)				X		
Kinosternon subrubrum				X		
Hyla avivoca (A)					1	0
Hyla versicolor-chrysoscelis (A)					4	0

Table 11. Thorn Pond (IDNR) - Site 11

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma maculatum (A)				X		
Ambystoma maculatum (L)	10					
Ambystoma opacum (A)				X		
Ambystoma opacum (L)	3					
Ambystoma talpoideum (A)	1					
Ambystoma talpoideum (L)	4					
Notophthalmus viridescens (A)	1		1			
Pseudacris crucifer (A)				X		
Pseudacris crucifer (L)	13					
Rana catesbeiana (A)	3	1				
Rana catesbeiana (L)	46	66				
Rana clamitans (L)	12	11				
Rana sphenocephala (A)				X		
Chelydra serpentina		1				
Kinosternon subrubrum		2				
Acris blanchardi (A)				X		
Agkistrodon piscivorus				X		
Hyla versicolor-chrysoscelis				X	3	4

Table 12. Little Black Slough West (IDNR) - Site 12

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	1		1			
Notophthalmus viridescens (A)	1					
Rana catesbeiana (A)	2	2				
Rana catesbeiana (L)	1		2			
Rana clamitans (A)	4					
Rana clamitans (L)	79	56				
Rana sphenocephala (A)		1		X		
Rana sphenocephala (L)	3					
Hyla avivoca (L)	2					
Hyla avivoca (A)				X	8	7
Hyla cinerea (A)				X	0	0
Hyla chrysoscelis-versicolor (A)					3	2
Nerodia rhombifer	1					
Acris blanchardi (A)				X		
Agkistrodon piscivorus				X		
Coluber constrictor				X		
Plethodon glutinosus (A)				X		
Anaxyrus americanus (A)				X		
Trachemys scripta				X		
Chrysemys picta				X		

Table 13. Little Black Slough West (IDNR) - Site 13

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma opacum (A)				X		
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	1					
Notophthalmus viridescens (A)	8					
Anaxyrus americanus (L)	1					
Pseudacris crucifer (L)	2					
Rana catesbeiana (A)	2	3				
Rana catesbeiana (L)	8	4	27			
Rana clamitans (A)	1	1		X		
Rana clamitans (L)	139	43				
Rana sphenocephala (A)	1			X		
Rana sphenocephala (L)	40	1				
Siren intermedia (A)	1					
Agkistrodon piscivorus		2		X		
Chelydra serpentina		1		X		
Kinosternon subrubrum		4				
Sternotherus odoratus		1				
Acris blanchardi (A)				X		
Chrysemys picta				X		
Hyla avivoca (A)					10	10
Hyla cinerea (A)				X	1	0
Hyla versicolor-chrysoscelis (A)					2	1

Table 14. Hogan's Bottoms South (USFWS) - Site 14

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (L)	2					
Pseudacris crucifer (L)	12					
Rana catesbeiana (A)	1	3		X		
Rana catesbeiana (L)	1	2				
Rana clamitans (A)	1	4		X		
Rana clamitans (L)	18	12	2			
Rana sphenocephala (A)	3			X		
Rana sphenocephala (L)	1					
Farancia abacura	1	1				
Siren intermedia (A)			1			
Chelydra serpentina		1				
Kinosternon subrubrum		1				
Nerodia erythrogaster neglecta		1				
Acris blanchardi (A)				X		
Hyla avivoca (A)					8	4
Hyla cinerea (A)				X	14	7
Hyla versicolor-chrysoscelis (A)				X	13	3
Terrapene carolina				X		
Trachemys scripta				X		
Ambystoma opacum (A)				X		

Table 15. Hogan's Bottoms North (USFWS) - Site 15

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Rana catesbeiana (A)	6	3		X		
Rana catesbeiana (L)	6	8				
Rana clamitans (A)	5	1		X		
Rana clamitans (L)	20	12				
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	7					
Siren intermedia (A)	2	6				
Kinosternon subrubrum		1				
Acris blanchardi (A)				X		
Hyla avivoca (A)				X	8	7
Hyla cinerea (A)				X	15	11
Hyla versicolor-chrysoscelis (A)					5	2

Table 16. Hogan's Bottoms North (USFWS) - Site 16

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (L)	1					
Rana catesbeiana (A)	4	3		X		
Rana catesbeiana (L)	3	1				
Rana clamitans (A)	1			X		
Rana clamitans (L)	15	5				
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	2					
Siren intermedia (A)	1					
Kinosternon subrubrum		2				
Acris blanchardi (A)				X		
Agkistrodon piscivorus				X		
Hyla avivoca (A)					6	5
Hyla cinerea (A)				X	11	7
Hyla versicolor-chrysoscelis (A)					5	3
Trachemys scripta				X		
Plestiodon fasciatus				X		

Table 17. Hogan's Bottoms North (USFWS) - Site 17

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Acris blanchardi (A)	2			X		
Rana catesbeiana (A)		5				
Rana catesbeiana (L)	7					
Rana clamitans (A)	1	1				
Rana clamitans (L)	20	18	2			
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	12					
Sternotherus odoratus	1					
Siren intermedia (A)		5	1			
Kinosternon subrubrum		1				
Agkistrodon piscivorus				X		
Anaxyrus americanus (A)				X		
Hyla avivoca (A)					3	6
Hyla cinerea (A)				X	29	10
Hyla versicolor-chrysoscelis (A)	1				4	3
Nerodia erythrogaster				X		
Pseudacris crucifer					1	0

Table 18. Watson Pond (IDNR) - Site 18

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Notophthalmus viridescens (A)	5					
Pseudacris crucifer (L)	1					
Siren intermedia (L)	1					
Farancia abacura	1					
Nerodia erythrogaster neglecta		1		X		
Acris blanchardi (A)				X		
Ambystoma opacum (A)				X		
Agkistrodon piscivorus				X		
Carphophis amoenus				X		
Eurycea lucifuga (A)				X		
Hyla avivoca (A)				X	3	3
Hyla cinerea (A)				X	0	0
Hyla versicolor-chrysoscelis (A)				X	1	1
Rana catesbeiana (A)				X		
Rana clamitans (A)				X		
Rana sphenocephala (A)				X		
Scincella barbouri				X		
Storeria occipitomaculata				X		
Terrapene carolina				X		

Table 19. Watson Pond (IDNR) - Site 19

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Notophthalmus viridescens (A)	2					
Rana catesbeiana (A)	1	2		X		
Rana catesbeiana (L)		3				
Rana clamitans (A)				X		
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	2					
Sternotherus odoratus	1	1				
Siren intermedia (A)			1			
Agkistrodon piscivorus		1		X		
Nerodia sipedon		1				
Acris blanchardi (A)				X		
Ambystoma opacum (A)				X		
Hyla avivoca (A)				X	6	3
Hyla versicolor-chrysoscelis (A)				X	2	0
Trachemys scripta				X		

Table 20. Little Black Slough North (IDNR) - Site 20

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	2					
Ambystoma texanum (A)				X		
Pseudacris crucifer (L)	2					
Rana catesbeiana (A)	2	4	1	X		
Rana catesbeiana (L)	6	11				
Rana clamitans (A)				X		
Rana clamitans (L)	6	7	1			
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	3					
Kinosternon subrubrum		1				
Siren intermedia (A)		3				
Agkistrodon piscivorus		1		X		
Nerodia rhombifer		1				
Acris blanchardi (A)				X		
Hyla avivoca (A)				X	5	4
Hyla versicolor-chrysoscelis (A)					2	0

Table 21. Little Black Slough North (IDNR) - Site 21

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Rana catesbeiana (A)	1	4		X		
Rana catesbeiana (L)	3	8				
Rana clamitans (A)	1	2		X		
Rana clamitans (L)	9	3				
Rana sphenocephala (A)		1		X		
Rana sphenocephala (L)	10	1				
Chelydra serpentina		2				
Siren intermedia (A)		2				
Acris blanchardi (A)				X		
Agkistrodon piscivorus				X		
Hyla avivoca (A)				X	2	1
Hyla cinerea (A)					1	0
Hyla versicolor-chrysoscelis (A)				X	2	1
Pseudacris crucifer (A)				X		
Notophthalmus viridescens (A)				X		

Table 22. Fain Cemetery (IDNR) - Site 22

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	2					
Ambystoma opacum (A)				X		
Pseudacris crucifer (L)	2					
Rana catesbeiana (A)	1	1		X		
Rana catesbeiana (L)	8	4				
Rana clamitans (A)	2	1		X		
Rana clamitans (L)	15	11				
Rana sphenocephala (A)		2		X		
Rana sphenocephala (L)	57	2				
Siren intermedia (A)	1	2				
Kinosternon subrubrum		1				
Acris blanchardi (A)				X		
Agkistrodon piscivorus				X		
Hyla avivoca (A)				X	1	1
Hyla cinerea (A)				X	1	1
Hyla versicolor-chrysoscelis (A)				X	0	0
Hyla versicolor-chrysoscelis (L)	10					
Nerodia erythrogaster neglecta				X		
Terrapene carolina				X		

Table 23. Fain Cemetery (IDNR) - Site 23

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Pseudacris crucifer (L)	10					
Rana catesbeiana (A)	1		3	X		
Rana catesbeiana (L)	1		1			
Rana clamitans (A)	2		2	X		
Rana clamitans (L)	10		11			
Rana sphenocephala (A)	3		1	X		
Rana sphenocephala (L)	83		1			
Chrysemys picta		1				
Chelydra serpentina		1				
Kinosternon subrubrum		2				
Siren intermedia (A)		2				
Acris blanchardi (A)				X		
Agkistrodon piscivorus				X		
Hyla avivoca (A)				X	1	1
Hyla cinerea (A)				X	2	1
Hyla versicolor-chrysoscelis (A)				X	3	0
Hyla versicolor-chrysoscelis (L)	12					
Plethodon glutinosus (A)				X		
Ambystoma texanum (A)				X		

Table 24. Deer Pond (IDNR) - Site 24

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma opacum (A)				X		
Ambystoma opacum (L)	7					
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	6					
Pseudacris triseriata (A)				X		
Pseudacris crucifer (L)	15					
Rana catesbeiana (A)	1	2				
Rana clamitans (A)				X		
Rana sphenocephala (A)				X		
Rana sphenocephala (L)	3					
Kinosternon subrubrum		5				
Hyla versicolor-chrysoscelis (A)				X	13	9

Table 25. Deer Pond (IDNR) - Site 25

Species	Minnow	Turtle	Trash Can	Observations	Pipe Trap New	Pipe Trap Recapture
Ambystoma talpoideum (A)				X		
Ambystoma talpoideum (L)	193					
Ambystoma opacum (A)				X		
Pseudacris triseriata (A)				X		
Pseudacris crucifer (L)	4					
Rana catesbeiana (A)	4	2				
Rana clamitans (A)	1					
Rana clamitans (L)	1	1				
Rana sphenocephala (A)		1		X		
Rana sphenocephala (L)	993	85				
Chelydra serpentina		1				
Kinosternon subrubrum		7				
Nerodia sipedon		3				
Hyla avivoca (A)				X	0	0
Hyla versicolor-chrysoscelis (A)	1			X	9	2
Terrapene carolina				X		

Table 26. Mudline Flatwoods (USFWS) - Station 26

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma opacum (L)	35				
Ambystoma talpoideum (L)	7				
Pseudacris crucifer (L)	5				
Rana catesbeiana (A)	2	1			
Rana sphenocephala (L)	190	29			
Nerodia erythrogaster neglecta	1				
Hyla cinerea (A)				11	10
Hyla versicolor-chrysoscelis (A)			X	2	2
Ambystoma maculatum (A)			X		
Terrapene carolina			X		
Ambystoma opacum (A)			X		
Pseudacris feriarum (A)			X		
Acris blanchardi (A)			X		
Siren intermedia (A)		1			

Table 27. Mudline Slough (USFWS) - Station 27

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	1	7	X		
Rana clamitans (A)	1		X		
Rana clamitans (L)	1				
Rana sphenocephala (L)	23	1			
Hyla cinerea (A)				7	8
Hyla versicolor-chrysoscelis (A)			X	9	2
Ambystoma maculatum (A)			X		
Acris blanchardi (A)			X		
Rana sphenocephala (A)			X		
Terrapene carolina			X		

Table 28. Unity INAI (IDNR) - Station 28

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Hyla cinerea (A)			X	17	6
Nerodia erythrogaster		1	X		
Thamnophis proximus			X		
Acris blanchardi (A)			X		
Rana catesbeiana (A)			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Sternotherus odoratus			X		
Trachemys scripta					

Table 29. Unity INAI (IDNR) - Station 29

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana sphenocephala (L)	2				
Nerodia rhombifer	1				
Hyla cinerea (A)			X	16	4
Acris blanchardi (A)			X		
Chrysemys picta			X		
Rana catesbeiana (A)			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Trachemys scripta		8	X		
Nerodia sipedon		1			

Table 30. Horseshoe Ditch (IDNR) - Station 30

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Pseudacris triseriata (L)	1				
Hyla cinerea (A)				9	7
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Thamnophis proximus			X		
Trachemys scripta			X		
Farancia abacura		1			

Table 31. Horseshoe Ditch (IDNR) - Station 31

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana sphenocephala (L)	2				
Hyla cinerea (A)				12	5
Acris blanchardi (A)			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Trachemys scripta			X		
Chelydra serpentina		1			
Nerodia erythrogaster		1			

Table 32. Cache Bend Slough (USFWS) - Station 32

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Acris blanchardi (A)	1		X		
Rana clamitans (L)	1				
Rana sphenocephala (L)	4				
Hyla cinerea (A)			X	9	0
Hyla versicolor-chrysoscelis (A)				9	1
Anaxyrus americanus			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Trachemys scripta		6			
Chelydra serpentina			X		

Table 33. Cache Bend Slough (USFWS) - Station 33

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana sphenocephala (L)	3				
Hyla cinerea (A)			X	4	6
Hyla versicolor-chrysoscelis (A)			X	8	5
Acris blanchardi (A)			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Trachemys scripta		7			
Rana clamitans (L)		2			

Table 34. Tamms Pumphouse (USFWS) - Station 34

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana clamitans (L)	2				
Rana sphenocephala (L)	10	1			
Hyla cinerea (A)				21	10
Hyla versicolor-chrysoscelis (A)				5	3
Acris blanchardi (A)			X		
Nerodia erythrogaster			X		
Rana catesbeiana (A)		1	X		
Rana clamitans (A)		2	X		
Trachemys scripta		13	X		
Chrysemys picta		3			

Table 35. Tamms Pumphouse (USFWS) - Station 35

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (L)	2				
Rana clamitans (L)	12	2			
Rana sphenocephala (L)	21	3			
Siren intermedia (A)	1				
Hyla cinerea (A)			X	27	14
Hyla versicolor-chrysoscelis (A)				3	1
Acris blanchardi (A)			X		
Nerodia erythrogaster			X		
Rana clamitans (A)		1	X		
Chrysemys picta		1			
Rana catesbeiana (A)		1			
Sternotherus odoratus		2			
Trachemys scripta		3			
Farancia abacura		2			

Table 36. Clear Creek South (USFS) - Station 36

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	4	2			
Rana catesbeiana (L)	1	5			
Rana clamitans (L)	2	1			
Rana sphenocephala (A)	1		X		
Rana sphenocephala (L)	2	2			
Hyla cinerea (A)				1	1
Hyla versicolor-chrysoscelis (A)				1	0
Acris blanchardi (A)			X		
Rana clamitans (A)			X		
Trachemys scripta			X		
Siren intermedia (A)		1			
Nerodia erythrogaster		1			
Nerodia rhombifer		2			

Table 37. Clear Creek South (USFS) - Station 37

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	2	7	X		
Rana catesbeiana (L)	6	11			
Rana clamitans (L)	10	8			
Rana sphenocephala (L)	4				
Nerodia rhombifer	1	3			
Hyla cinerea (A)				1	0
Ambystoma maculatum (A)			X		
Acris blanchardi (A)			X		
Nerodia erythrogaster neglecta			X		
Rana clamitans (A)		1	X		
Rana sphenocephala (A)			X		
Chelydra serpentina		1			
Siren intermedia (A)		3			

Table 38. Clear Creek North (USFS) - Station 38

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Chelydra serpentina	1				
Rana sphenocephala (L)	5				
Hyla versicolor-chrysoscelis (A)				2	3
Ambystoma maculatum (A)			X		
Rana catesbeiana (A)		1	X		
Rana clamitans (A)		1			
Siren intermedia (A)		12			
Nerodia rhombifer		1			

Table 39. Clear Creek North (USFS) - Station 39

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	1				
Rana sphenocephala (L)	9				
Hyla cinerea (A)				3	4
Hyla versicolor-chrysoscelis (A)				4	2
Trachemys scripta		1	X		
Nerodia erythrogaster		3	X		
Thamnophis proximus			X		
Chelydra serpentina		1			
Siren intermedia (A)		6			
Rana clamitans (L)		1			

Table 40. Clear Creek North (USFS) - Station 40

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana clamitans (A)	1	1			
Rana sphenocephala (L)	19	1			
Siren intermedia (A)	1	2			
Hyla versicolor-chrysoscelis (A)				5	10
Hyla cinerea (A)				2	4
Ambystoma maculatum (A)			X		
Rana catesbeiana (A)		2			
Rana sphenocephala (A)		1			
Rana clamitans (L)		1			
Farancia abacura		1			

Table 41. Union County Conservation Area (IDNR) - Station 41

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	4				
Rana catesbeiana (A)	10	12	X		
Rana catesbeiana (L)	55	24			
Rana clamitans (L)	18	9			
Rana sphenocephala (L)	45	10			
Siren intermedia (A)	1				
Nerodia erythrogaster	1	9			
Hyla cinerea (A)				2	1
Hyla versicolor-chrysoscelis (A)				8	4
Acris blanchardi (A)			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)		1	X		
Chelydra serpentina		1			
Trachemys scripta		1			
Nerodia rhombifer		1			

Table 42. Union County Conservation Area (IDNR) - Station 42

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	7				
Rana catesbeiana (A)	11	23	X		
Rana catesbeiana (L)	6	40			
Rana clamitans (A)	1		X		
Rana clamitans (L)	45	26			
Rana sphenocephala (L)	50				
Nerodia erythrogaster	1	2	X		
Hyla cinerea (A)				3	1
Hyla versicolor-chrysoscelis (A)				8	3
Pseudacris crucifer (A)			X		
Acris blanchardi (A)			X		
Rana sphenocephala (A)			X		
Chelydra serpentina		1			
Siren intermedia (A)		4			
Trachemys scripta		1			

Table 43. Union County Conservation Area (IDNR) - Station 43

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma maculatum (L)	6				
Ambystoma opacum (L)	13				
Notophthalmus viridescens (A)	3				
Pseudacris crucifer (A)	1		X		
Pseudacris crucifer (L)	7				
Rana catesbeiana (A)	1	4			
Rana clamitans (A)	1				
Rana sphenocephala (L)	2				
Hyla versicolor-chrysoscelis (A)				6	2
Ambystoma maculatum (A)			X		
Acris blanchardi (A)			X		
Ambystoma opacum (A)			X		
Ambystoma talpoideum (A)			X		
Rana sphenocephala (A)			X		
Siren intermedia (A)		3			

Table 44. LaRue Pine Hills Otter Pond (SIUC) - Station 44

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	15				
Rana clamitans (L)	3	2			
Rana sphenocephala (L)	2				
Siren intermedia (A)	1				
Hyla avivoca (A)				3	0
Hyla cinerea (A)				9	3
Ambystoma maculatum (A)			X		
Agkistrodon contortrix			X		
Acris blanchardi (A)			X		
Agkistrodon piscivorus		1	X		
Rana catesbeiana (A)			X		
Rana clamitans (A)		1	X		
Rana sphenocephala (A)			X		
Nerodia cyclopion		2			

Table 45. LaRue Pine Hills Otter Pond - Station 45

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	23				
Hyla avivoca (A)				2	1
Hyla cinerea (A)			X	4	3
Hyla versicolor-chrysoscelis (A)				1	1
Ambystoma maculatum (A)			X		
Acris blanchardi (A)			X		
Agkistrodon piscivorus		2	X		
Rana catesbeiana (A)			X		
Rana clamitans (A)		1	X		
Rana sphenocephala (A)			X		
Rana catesbeiana (L)		1			
Rana clamitans (L)		3			
Farancia abacura		1			
Nerodia erythrogaster		1			

Table 46. LaRue Pine Hills Otter Pond (USFS) - Station 46

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Chelydra serpentina	1				
Notophthalmus viridescens (A)	11		X		
Rana clamitans (A)	1	1	X		
Rana clamitans (L)	1	4			
Rana sphenocephala (L)	1				
Nerodia cyclopion	1	2			
Hyla avivoca (A)				3	3
Hyla cinerea (A)				23	16
Acris blanchardi (A)			X		
Agkistrodon piscivorus		2	X		
Rana catesbeiana (A)			X		
Rana sphenocephala (A)			X		
Rana catesbeiana (L)		2			
Nerodia erythrogaster		1			

Table 47. LaRue Pine Hills Winters Pond (USFS) - Station 47

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	19				
Rana sphenocephala (A)	1	1	X		
Rana sphenocephala (L)	3				
Sternotherus odoratus	1				
Hyla avivoca (A)				7	8
Hyla cinerea (A)			X	20	13
Hyla versicolor-chrysoscelis (A)				1	1
Acris blanchardi (A)			X		
Rana catesbeiana (A)		1	X		
Rana clamitans (A)		1	X		
Rana clamitans (L)		1			
Agkistrodon piscivorus		1			
Nerodia cyclopion		1			

Table 48. LaRue Pine Hills Winters Pond (USFS) - Station 48

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	4				
Rana sphenocephala (L)	2				
Sternotherus odoratus	1				
Hyla avivoca (A)				9	6
Hyla cinerea (A)			X	13	6
Hyla versicolor-chrysoscelis (A)				1	2
Acris blanchardi (A)			X		
Rana catesbeiana (A)			X		
Rana sphenocephala (A)			X		
Rana catesbeiana (L)		1			
Agkistrodon piscivorus		1	X		

Table 49. LaRue Pine Hills Winters Pond (USFS) - Station 49

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	6				
Rana catesbeiana (L)	1				
Rana sphenocephala (A)	1	1	X		
Rana sphenocephala (L)	3	2			
Siren intermedia (A)	1				
Hyla avivoca (A)				4	3
Hyla cinerea (A)			X	14	4
Hyla versicolor-chrysoscelis (A)				1	0
Acris blanchardi (A)			X		
Rana catesbeiana (A)			X		
Rana clamitans (A)			X		

Table 50. LaRue Pine Hills Winters Pond (USFS) - Station 50

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	9				
Rana clamitans (L)	1				
Rana sphenocephala (A)	1		X		
Rana sphenocephala (L)	3				
Siren intermedia (A)	1				
Sternotherus odoratus	1		X		
Hyla cinerea (A)			X	3	1
Acris blanchardi (A)			X		
Pseudacris crucifer (A)			X		
Rana catesbeiana (A)			X		
Rana clamitans (A)		1	X		
Trachemys scripta			X		

Table 51. Cache Wetlands Center (IDNR) - Station 51

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	8	9	X		
Rana catesbeiana (L)	5				
Rana clamitans (L)	3				
Rana sphenocephala (A)	1		X		
Rana sphenocephala (L)	7				
Hyla cinerea (A)				5	3
Hyla versicolor-chrysoscelis (A)				16	17
Acris blanchardi (A)			X		
Rana clamitans (A)			X		
Trachemys scripta			X		
Sternotherus odoratus		2			

Table 52. Cache Wetlands Center (IDNR) - Station 52

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	7	4			
Rana catesbeiana (L)	4				
Rana clamitans (A)	1				
Rana clamitans (L)	16				
Rana sphenocephala (L)	33				
Hyla cinerea (A)				9	5
Hyla versicolor-chrysoscelis (A)				10	16
Acris blanchardi (A)			X		
Sternotherus odoratus		4			
Trachemys scripta		3			

Table 53. Little Black Slough Eden (IDNR) - Station 53

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma talpoideum (L)	3		X		
Notophthalmus viridescens (A)	5				
Rana catesbeiana (A)	1	2	X		
Rana catesbeiana (L)	2				
Rana clamitans (A)	4	4	X		
Rana clamitans (L)	6				
Rana sphenocephala (A)	1		X		
Rana sphenocephala (L)	22				
Hyla avivoca (A)			X	12	19
Hyla cinerea (A)			X	3	0
Hyla versicolor-chrysoscelis (A)				3	4
Acris blanchardi (A)			X		
Agkistrodon piscivorus		3	X		
Anaxyrus americanus (A)			X		
Pseudacris maculata (A)			X		
Trachemys scripta			X		
Chelydra serpentina		1			
Nerodia erythrogaster		1			

Table 54. Little Black Slough Eden (IDNR) - Station 54

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	4	1			
Rana catesbeiana (A)	1				
Rana catesbeiana (L)	1				
Rana clamitans (A)	13	4	X		
Rana clamitans (L)	7				
Rana sphenocephala (L)	17				
Hyla avivoca (A)				16	19
Hyla cinerea (A)				1	0
Hyla versicolor-chrysoscelis (A)				7	11
Acris blanchardi (A)			X		
Agkistrodon piscivorus		1	X		
Ambystoma talpoideum (A)			X		
Anaxyrus americanus (A)			X		
Nerodia erythrogaster			X		
Pseudacris crucifer (A)			X		
Rana sphenocephala (A)			X		
Kinosternon subrubrum		1			

Table 55. Little Black Slough Eden (IDNR) - Station 55

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Acris blanchardi (A)	2		X		
Ambystoma talpoideum (A)	1				
Notophthalmus viridescens (A)	4				
Rana clamitans (A)	3	1	X		
Rana clamitans (L)	4				
Rana sphenocephala (L)	7				
Hyla avivoca (A)				8	6
Hyla cinerea (A)				15	15
Hyla versicolor-chrysoscelis (A)				4	2
Agkistrodon piscivorus			X		
Rana catesbeiana (A)		2	X		
Rana sphenocephala (A)			X		
Chelydra serpentina		1			
Sternotherus odoratus		1			

Table 56. Little Black Slough Belknap (IDNR) - Station 56

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Acris blanchardi (A)	1		X		
Notophthalmus viridescens (A)	4				
Rana clamitans (A)	1		X		
Rana clamitans (L)	1				
Rana sphenocephala (L)	2				
Hyla avivoca (A)			X	9	11
Hyla cinerea (A)			X	5	3
Hyla versicolor-chrysoscelis (A)				4	2
Agkistrodon piscivorus		4	X		

Table 57. Little Black Slough Belknap (IDNR) - Station 57

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Acris blanchardi (A)	4	1	X		
Notophthalmus viridescens (A)	6				
Pseudacris crucifer (L)	1				
Rana catesbeiana (A)	3	2	X		
Rana catesbeiana (L)	6				
Rana clamitans (A)	9	3	X		
Rana clamitans (L)	5				
Rana sphenocephala (A)	3	3			
Rana sphenocephala (L)	21				
Agkistrodon piscivorus	1	2	X		
Hyla avivoca (A)			X	7	7
Hyla avivoca (L)	26				
Hyla cinerea (A)			X	4	2
Hyla versicolor-chrysoscelis (A)				5	1
Hyla versicolor-chrysoscelis (L)	1				
Ambystoma maculatum (A)			X		
Ambystoma talpoideum (A)			X		
Eurycea lucifuga (A)			X		
Plestiodon fasciatus			X		
Trachemys scripta			X		
Kinosternon subrubrum		1			
Nerodia erythrogaster		1			
Nerodia erythrogaster neglecta		1			

Table 58. Little Black Slough Belknap (IDNR) - Station 58

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	1		X		
Rana catesbeiana (A)	5	4	X		
Rana catesbeiana (L)	2				
Rana clamitans (A)	2	1	X		
Rana clamitans (L)	1				
Rana sphenocephala (L)	1				
Siren intermedia (A)	1				
Hyla avivoca (A)				8	6
Hyla cinerea (A)			X	1	0
Hyla versicolor-chrysoscelis (A)				5	1
Acris blanchardi (A)			X		
Agkistrodon piscivorus		2	X		
Pantherophis spiloides			X		
Rana sphenocephala (A)			X		
Nerodia erythrogaster neglecta		1			
Nerodia rhombifer		1			

Table 59. Tunnel Hill (IDNR) - Station 59

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma opacum (L)	5				
Ambystoma texanum (L)	3				
Rana sphenocephala (A)	1		X		
Siren intermedia (L)	2				
Hyla cinerea (A)				2	3
Hyla versicolor-chrysoscelis (A)			X	5	2
Acris blanchardi (A)			X		
Rana clamitans (A)		1	X		
Siren intermedia (A)		1			

Table 60. Tunnel Hill (IDNR) - Station 60

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma opacum (L)	7				
Rana sphenocephala (L)	1				
Hyla versicolor-chrysoscelis (A)			X	2	2
Acris blanchardi (A)			X		
Ambystoma opacum (A)			X		
Pseudacris crucifer (A)			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)		1	X		

Table 61. Mermet Swamp (IDNR) - Station 61

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	2	2	X		
Rana clamitans (A)	3	1	X		
Rana clamitans (L)	9				
Rana sphenocephala (A)	2		X		
Rana sphenocephala (L)	2				
Siren intermedia (A)	2	1			
Hyla versicolor-chrysoscelis (A)				14	7
Acris blanchardi (A)			X		
Nerodia erythrogaster			X		
Chrysemys picta		1			

Table 62. Mermet Swamp (IDNR) - Station 62

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma talpoideum (L)	1				
Rana clamitans (L)	1				
Rana sphenocephala (L)	4				
Hyla cinerea (A)				3	2
Hyla versicolor-chrysoscelis (A)				21	7
Acris blanchardi (A)			X		
Chrysemys picta			X		
Nerodia erythrogaster			X		
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Terrapene carolina			X		
Trachemys scripta			X		
Siren intermedia (A)		1			

Table 63. Mermet Swamp (IDNR) - Station 63

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	3	2			
Rana catesbeiana (L)	2				
Rana clamitans (A)	1		X		
Rana clamitans (L)	1				
Rana sphenocephala (L)	2				
Agkistrodon piscivorus	1	1			
Hyla cinerea (A)				1	2
Hyla versicolor-chrysoscelis (A)				8	8
Acris blanchardi (A)			X		
Farancia abacura		1	X		
Pseudacris crucifer (A)			X		
Siren intermedia (A)		5			

Table 64. Mermet Swamp (IDNR) - Station 64

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	7	10	X		
Rana catesbeiana (L)	20				
Rana clamitans (A)	2		X		
Rana clamitans (L)	19				
Rana sphenocephala (L)	29				
Nerodia erythrogaster neglecta	1	2			
Hyla cinerea (A)			X	24	23
Hyla versicolor-chrysoscelis (A)				41	22
Hyla versicolor-chyrsoscelis (L)	26				
Acris blanchardi (A)			X		
Ambystoma maculatum (A)			X		
Agkistrodon piscivorus		2	X		
Pseudacris maculata (A)			X		
Rana sphenocephala (A)			X		
Kinosternon subrubrum		1			
Siren intermedia (A)		4			
Sternotherus odoratus		1			

Table 65. Mermet Swamp (IDNR) - Station 65

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	2	1			
Rana sphenocephala (A)	2	1	X		
Hyla cinerea (A)				8	9
Hyla versicolor-chrysoscelis (A)				6	4
Acris blanchardi (A)			X		
Chelydra serpentina			X		
Rana clamitans (A)			X		

Table 66. Mermet Swamp (IDNR) - Station 66

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Acris blanchardi (L)	1				
Ambystoma opacum (L)	1				
Ambystoma talpoideum (A)	4				
Ambystoma talpoideum (L)	1				
Ambystoma texanum (L)	1				
Rana catesbeiana (A)	1	3			
Rana catesbeiana (L)	1				
Rana sphenocephala (A)	2	1	X		
Rana sphenocephala (L)	2				
Hyla cinerea (A)				3	3
Hyla versicolor-chrysoscelis (A)				13	16
Ambystoma opacum (A)			X		
Ambystoma texanum (A)			X		
Pseudacris maculata (A)			X		
Terrapene carolina			X		

Table 67. Big Cypress (IDNR) - Station 67

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Siren intermedia (A)	1				
Hyla cinerea (A)				2	1
Hyla versicolor-chrysoscelis (A)			X	1	0
Ambystoma maculatum (A)			X		
Rana sphenocephala (A)			X		
Terrapene carolina			X		

Table 68. Big Cypress (IDNR) - Station 68

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma opacum (L)	8				
Notophthalmus viridescens (A)	1				
Rana catesbeiana (A)	2	3			
Rana clamitans (A)	1		X		
Rana clamitans (L)	1				
Rana sphenocephala (A)	1	1	X		
Rana sphenocephala (L)	6				
Siren intermedia (A)	1	1			
Hyla avivoca (A)				1	1
Hyla versicolor-chrysoscelis (A)			X	2	1
Ambystoma maculatum (A)			X		
Ambystoma opacum (A)			X		
Ambystoma talpoideum (A)			X		
Ambystoma texanum (A)			X		
Chelydra serpentina			X		
Nerodia erythrogaster			X		
Pseudacris crucifer (A)			X		
Trachemys scripta		1			

Table 69. Vienna Correctional Center (IDOC) - Station 69

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	1				
Rana catesbeiana (A)	1	4	X		
Rana catesbeiana (L)	56				
Rana clamitans (A)	2	2	X		
Rana clamitans (L)	18				
Rana sphenocephala (L)	25				
Sternotherus odoratus	1				
Hyla avivoca (A)				11	10
Hyla cinerea (A)				7	3
Hyla versicolor-chrysoscelis (A)				8	5
Acris blanchardi (A)			X		
Agkistrodon piscivorus		3	X		
Rana sphenocephala (A)		1	X		
Nerodia erythrogaster neglecta		1			
Nerodia erythrogaster		1			
Nerodia sipedon		1			

Table 70. Vienna Correctional Center (IDOC) - Station 70

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Notophthalmus viridescens (A)	4				
Rana catesbeiana (A)	1	2			
Rana catesbeiana (L)	9				
Rana clamitans (L)	42				
Rana sphenocephala (L)	6				
Hyla avivoca (A)				2	2
Hyla cinerea (A)				4	3
Hyla versicolor-chrysoscelis (A)			X	24	9
Acris blanchardi (A)			X		
Ambystoma opacum (A)			X		
Agkistrodon piscivorus		1	X		
Pseudacris maculata (A)			X		
Rana sphenocephala (A)			X		
Storeria occipitomaculata			X		
Terrapene carolina			X		

Table 71. Vienna Correctional Center (IDOC) - Station 71

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma talpoideum (L)	1				
Pseudacris crucifer (L)	1				
Rana catesbeiana (A)	1	1	X		
Rana clamitans (A)	2		X		
Rana clamitans (L)	60				
Rana sphenocephala (A)	8		X		
Rana sphenocephala (L)	20				
Hyla cinerea (A)			X	4	3
Hyla versicolor-chrysoscelis (A)				17	11
Acris blanchardi (A)			X		
Agkistrodon piscivorus		2	X		
Anaxyrus americanus (A)			X		
Carphophis amoenus			X		
Plestiodon fasciatus			X		
Plethodon glutinosus (A)			X		
Pseudacris maculata (A)			X		
Terrapene carolina			X		
Trachemys scripta		1	X		
Anaxyrus fowleri (A)		1			

Table 72. Vienna Correctional Center (IDOC) - Station 72

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma talpoideum (L)	3				
Notophthalmus viridescens (A)	3				
Pseudacris crucifer (L)	28				
Rana catesbeiana (A)	1	6	X		
Rana catesbeiana (L)	1				
Rana clamitans (A)	1		X		
Rana clamitans (L)	10				
Rana sphenocephala (L)	20				
Hyla avivoca (A)			X	4	5
Hyla cinerea (A)			X	1	2
Hyla versicolor-chrysoscelis (A)			X	1	0
Acris blanchardi (A)			X		
Ambystoma opacum (A)			X		
Rana sphenocephala (A)			X		
Terrapene carolina			X		
Agkistrodon piscivorus			X		
Nerodia rhombifer			X		

Table 73. Vienna Correctional Center (IDOC) - Station 73

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma talpoideum (L)	2				
Rana clamitans (L)	3				
Rana sphenocephala (L)	108				
Hyla avivoca (A)	1			4	3
Hyla cinerea (A)				1	0
Hyla versicolor-chrysoscelis (A)				1	1
Acris blanchardi (A)			X		
Ambystoma opacum (A)			X		
Agkistrodon piscivorus		1	X		
Rana clamitans (A)			X		
Rana sphenocephala (A)			X		
Rana catesbeiana (A)		4			
Chelydra serpentina		2			
Siren intermedia (A)		1			
Trachemys scripta		2			

Table 74. Vienna Correctional Center (IDOC) - Station 74

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma talpoideum (L)	3				
Rana clamitans (L)	2				
Rana sphenocephala (A)	1		X		
Rana sphenocephala (L)	96				
Sternotherus odoratus	1	1			
Hyla avivoca (A)				6	1
Hyla versicolor-chrysoscelis (A)				2	0
Acris blanchardi (A)			X		
Agkistrodon piscivorus			X		
Terrapene carolina			X		
Chelydra serpentina		3			
Rana catesbeiana (A)		1			
Siren intermedia (A)		3			
Trachemys scripta		5			
Nerodia erythrogaster neglecta		1			
Nerodia sipedon		2			

Table 75. Vienna Correctional Center (IDOC) - Station 75

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma opacum (L)	5				
Ambystoma talpoideum (L)	1				
Notophthalmus viridescens (A)	1		X		
Rana clamitans (L)	1				
Rana sphenocephala (A)	1		X		
Rana sphenocephala (L)	7				
Hyla avivoca (A)				1	0
Hyla cinerea (A)				1	2
Hyla versicolor-chrysoscelis (A)				2	0
Acris blanchardi (A)			X		
Ambystoma opacum (A)			X		
Ambystoma texanum (A)			X		
Chelydra serpentina			X		
Plethodon glutinosus			X		
Pseudacris maculata			X		
Rana clamitans (A)		1	X		
Rana catesbeiana (A)		2			
Terrapene carolina			X		
Siren intermedia (A)		1			
Nerodia erythrogaster neglecta		2			

Table 76. Vienna Correctional Center (IDOC) - Station 77

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Rana catesbeiana (A)	2	2	X		
Rana catesbeiana (L)	1				
Rana sphenocephala (A)	2	1	X		
Rana sphenocephala (L)	1				
Agkistrodon piscivorus	1	9	X		
Hyla avivoca (A)			X	14	15
Hyla cinerea (A)			X	1	2
Hyla versicolor-chrysoscelis (A)			X	1	1
Acris blanchardi (A)			X		
Ambystoma opacum (A)			X		
Carphophis amoenus			X		
Plestiodon fasciatus			X		
Plethdon glutinosus			X		
Rana clamitans (A)			X		
Terrapene carolina			X		
Farancia abacura			X		

Table 77. Vienna Correctional Center (IDOC) - Station 78

Species	Minnow	Turtle	Observations	Pipe Trap New	Pipe Trap Recap
Ambystoma opacum (L)	1				
Notophthalmus viridescens (A)	5				
Rana clamitans (A)	1	1	X		
Hyla avivoca (A)			X	23	23
Hyla cinerea (A)			X	5	9
Hyla versicolor-chrysoscelis (A)				2	4
Acris blanchardi (A)			X		
Coluber constrictor			X		
Eurycea longicauda (A)			X		
Rana catesbeiana (A)		1	X		
Rana sphenocephala (A)			X		
Virginia valeriae			X		
Siren intermedia (A)		2			
Agkistrodon piscivorus		2			
Nerodia rhombifer		2			