

HISTORY AND STATUS OF HERPETOLOGY IN INDIANA

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ABSTRACT: The first scientific collections and observations of Indiana amphibians and reptiles were made near New Harmony during the period 1825 to 1839. Virtually no additional work was done until the establishment of the Indiana Academy of Science in 1885. In the decade that followed, two accounts of the amphibians and reptiles of the State were published as well as several additional papers dealing with the Indiana herpetofauna. Herpetological studies concerning the Indiana fauna during the first 60 years of this century were largely confined to short papers treating local faunas or recording casual observations. In the past three decades, interest in amphibians and reptiles has increased at both the professional and amateur level. An updated account of the amphibians and reptiles of the State appeared in 1972. Currently, research projects involving amphibians and reptiles are being earned out at many of the State's universities and colleges as well as at zoos and museums. An active and growing group of amateur herpetologists in the State have formed a society of their own.

KEYWORDS: Indiana herpetology, Indiana type localities, herpetology history, New Harmony, O.P. Hay.

In his 1887 account of the amphibians and reptiles of Indiana, Oliver P. Hay evidently felt a need to apologize for offending public taste when he said, "Briefly let us consider ... why these animals should receive our attention. 'Reptiles' are to most people objects of supreme disgust, and such persons can not conceive why anyone should study them or do anything else with them except destroy them from the face of the earth." Hay would be surprised to find that about a century later 17 species of Indiana amphibians and reptiles, including three of four species of venomous snakes, receive legal protection in the State. However, he would also find that many species plentiful in his day are uncommon today.

The earliest accounts of Indiana reptiles come from travelers' tales and county histories and usually only mention poisonous snakes. In an account of travel in the State in 1816, David Thomas (1819) said that his host near Salem was recovering from the bite of a copperhead, and he mentioned several other species of snakes that were found near Vincennes. Another visitor to Vincennes wrote (cited in Hopley, 1882), "I have seen on a very warm and bright day such numbers of water vipers twined round the limbs and trunks which margin the pond that it would be almost impossible to wade a yard without being in reach of one of them... The inhabitants say, however, they are harmless." In 1825, about seventy rattlesnakes were killed in one day near Paul's Mill in Decatur County. "This was considered rather better than an ordinary day for snakes" (Harding, 1915).

Although the Ohio River politically belongs to Kentucky, it shares a biota with Indiana, and a characteristic American salamander, the mudpuppy (*Necturus maculosus*), was described from the Ohio by Constantine Rafinesque (1818), probably from near the falls at Jeffersonville. Rafinesque was a brilliant naturalist with a mania for describing new species. He also was apparently not a very critical observer, for he (Rafinesque, 1820) described *Necturus phosphoreus* as

Table 1. Reptiles and amphibians originally described from localities (type localities) in Indiana.

Original Name	Author	Type Locality	Present Name
<i>Amblystoma fuscum</i>	Hallowell, 1858	Hanover College	<i>Ambystoma jeffersonianum</i>
<i>Amblystoma copeianum</i>	Hay, 1885	Irvington, Marion County	<i>Ambystoma tigrinum</i>
<i>Amblystoma microstomum</i>	Cope, 1861	Wabash River	<i>Ambystoma texanum</i>
<i>Eurycea longicauda pernix</i>	Mittleman, 1942	Brown County State Park	<i>Eurycea l. longicauda</i>
<i>Eurycea bislineata rivicola</i>	Mittleman, 1949	McCormick's Creek State Park	<i>Eurycea cirrigera</i>
<i>Gyrinophilus maculicaudus</i>	Cope, 1890	Brookville, Franklin County	<i>Eurycea lucifuga</i>
<i>Bufo hobarti</i>	Sanders, 1987	Shades State Park	<i>Bufo woodhousei fowleri</i>
<i>Hyla triseriata</i>	Wied-Neuwied, 1839	Rush Creek, 4 miles south of New Harmony	<i>Pseudacris t. triseriata</i>
<i>Rana circulosa</i>	Rice & Davis, 1878	Benton County	<i>Rana areolata circulosa</i>
<i>Emys pseudogeographica</i>	Gray, 1831	Wabash River at New Harmony	<i>Graptemys pseudogeo- graphica</i>
<i>Emys lesueuri</i>	Gray, 1831	Wabash River at New Harmony	<i>Graptemys pseudogeo- graphica</i>
<i>Emys labryinthica</i>	LeSueur, 1851	Wabash River at New Harmony	<i>Pseudemys concinna hieroglyphica</i>
<i>Emys elegans</i>	Wied-Neuwied, 1839	Fox River at New Harmony	<i>Trachemys scripta elegans</i>
<i>Chrysemys marginata</i>	Agassiz, 1857	Restricted to "northern Indiana" by Schmidt, 1953	<i>Chrysemys picta marginata</i>
<i>Trionyx spiniferus</i>	LeSueur, 1827	Wabash River at New Harmony	<i>Apalone s. spinifera</i>
<i>Trionyx ocellatus</i>	LeSueur, 1827	Wabash River at New Harmony	<i>Apalone s. spinifera</i>
<i>Gymnopus olivaceus</i>	Wied-Neuwied, 1865	New Harmony	<i>Apalone s. spinifera</i>
<i>Trionyx muticus</i>	LeSueur, 1827	Wabash River at New Harmony	<i>Apalone m. mutica</i>
<i>Eutaenia sirtalis graminea</i>	Cope, 1888	Brookville, Franklin County	<i>Thamnophis s. sirtalis</i>
<i>Eutaneia radix melanotaenia</i>	Cope, 1888	Brookville, Franklin County	<i>Thamnophis r. radix</i>
<i>Eutaenia butleri</i>	Cope, 1888	Richmond, Wayne County	<i>Thamnophis butleri</i>
<i>Ophibolus getulus niger</i>	Yarrow, 1882	Wheatland, Knox County	<i>Lampropeltis getula nigra</i>

“Another species from the Ohio, its gills shine in the night of a fiery red colour.” From other localities, he described three other well-known Indiana species — the red-spotted newt (*Notophthalmus viridescens*), the cave salamander (*Eurycea lucifuga*), and the massasauga (*Sistrurus catenatus*).

Like so much of Indiana history, herpetology has its roots in New Harmony, where the ideal community envisioned by Robert Owen attracted a group of brilliant naturalists. Here, between 1825 and 1839, the first significant scientific observations on reptiles and amphibians were made. Eight species of turtles, four currently valid, were first described from this area (Table 1). Included are Indiana's two species of softshells, *Apalone spinifera* and *A. mutica*. Most were obtained by Charles Alexander LeSueur, better known for his work in ichthyology and Australian natural history. However, Prince Maximilian zu Wied-Neuwied described a turtle destined for world notoriety, the red-eared turtle (*Trachemys scripta elegans*). This attractive and plentiful turtle became extremely popular in the pet trade beginning in the 1930's. Millions of juveniles were sold in the United States until 1975, when sales were stopped for health reasons. However, many red-eared turtles are still exported to nations not having such legislation. As a result of released pets, the red-eared turtle now has populations throughout the globe. Prince Maximilian also described from New Harmony one of the most frequently heard frogs of Indiana, the striped chorus frog (*Pseudacris triseriata*).

Interest in herpetology in Indiana seems to have been at a low level from 1840 until the founding of the Indiana Academy of Science in 1885. Although some individuals, such as James Sampson of New Harmony, Robert Ridgeway of Wheatland, Edward Hughes and Amos Butler of Brookville, and Barton Evermann of Terre Haute, made collections, only Ridgeway's specimens, now in the National Museum of Natural History, seem to have survived.

The first comprehensive account of the amphibians and reptiles of Indiana was that of Oliver P. Hay (1887a), then professor of biology and geology at Butler University. Shortly after the founding of the Indiana Academy of Science, he was appointed curator of herpetology. Later, he (Hay, 1892a) wrote a revised and more extensive account published by the Indiana Department of Geology and Natural Resources. He listed 81 species recorded from the State and an additional 25 species suspected to occur. He also recorded his observations on the natural history of Midwestern amphibians and reptiles. In separate papers, he reported on the habits of the massasauga (Hay, 1887b), one of the first life history studies of a rattlesnake, and on reproduction in Midwestern snakes (Hay, 1892b).

Willis S. Blatchley (1891, 1900, 1901), one of Indiana's most versatile and prolific naturalists, published several short papers on Indiana amphibians and reptiles. He also described the distinctive red cheeked salamander of the Smoky Mountains giving it the name *Plethodon jordani* in recognition of the Indiana Academy of Science's first President. Although Indiana University's distinguished zoologist Carl Eigenmann was not a herpetologist, his interest in cave fish led him to investigate cave salamanders.

Through the first sixty years of this century, most herpetological studies in Indiana were confined to local faunal lists and the records of casual observations. Among them were faunal lists and observations from the Indiana University biological stations near Mitchell (now Spring Mill State Park; Hahn, 1908) and

at Turkey Lake (now Lake Wawasee; Atkinson, 1896; Reddick, 1895) as well as the faunal survey of Lake Maxinkuckee (Everman and Clark, 1920). The herpetofauna of the Indiana Dunes region was initially investigated by Karl P. Schmidt, Walter Necker, and others from the Field Museum in the late 1930's (Pope, 1944), continued by Richard Edgren and W.T. Stille (Edgren and Stille, 1948; Stille and Edgren, 1948), and currently is being studied by Alan Resetar of the Field Museum. The activity of the Civilian Conservation Corps in Indiana during the 1930's was responsible for noteworthy herpetological papers by Chapman Grant (1936) and Paul Swanson (1939). M.B. Mittleman (1942, 1947, 1949), a herpetologist chiefly interested in salamanders, worked in Indiana during the 1940's. George S. Myers (1926) published a key to the amphibians and reptiles of the State listing 100 species. More broad-based studies such as those of Joseph Tihen on the Tertiary herpetofaunas of North America (1964) and James C. List (1966) on the osteology of leptotyphlopoid and typhlopoid snakes were also published. Minton (1972) lists other contributions from this era,

The author's first contribution to herpetology was an account of the reptiles of Indiana (Minton, 1944). The report was extremely amateurish and would never have seen print but for the kindness of Karl Schmidt, who felt deep concern for young herpetologists whose careers were being interrupted by the war. Later papers included a distributional study of amphibians and reptiles in Illinois and Indiana (Smith and Minton, 1957) and a report of some peculiarities in the systematics and life history of Jefferson's salamander in Indiana (Minton, 1954). This latter paper led to studies by Thomas Uzzell, then at the University of Michigan, indicating that Jefferson's salamander in the Midwest is a composite of two conventional species (*Ambystoma jeffersonianum* and *A. laterale*) and numerous female polyploid populations whose status remains unsettled (Uzzell, 1964; Morris and Brandon, 1984). The author's monograph on the amphibians and reptiles of the State (Minton, 1972) was based largely on field work done between 1947 and 1957 as well as between 1965 and 1970. The monograph listed 82 species making up the present fauna plus two extirpated and several doubtful species.

The 1970's saw an increase in interest in herpetology at both the professional and amateur level, partly due to a growing concern with the environment and a realization that amphibians and reptiles are sensitive indicators of environmental change. In addition, improvements in the techniques for studying natural populations of these animals had been developed and better methods for their husbandry had been found. Much current interest is centered on the decline in amphibian populations at the world and local levels. Michael Lannoo of Ball State University currently is U.S. Coordinator of the Declining Amphibian Populations Task Force. In 1984, the Nongame and Endangered Wildlife Program of the Department of Natural Resources established a Technical Advisory Committee to investigate the status of amphibians and reptiles in Indiana, to list species whose populations were especially at risk, and to make recommendations for their protection. This committee, now under the chairmanship of Daryl Karns, continues to monitor reptiles and amphibians in the State and to identify species needing special study and legal protection.

Research and teaching in herpetology are part of the curriculum at many of Indiana's universities and colleges. John O. Whitaker, Jr., and his students at

Indiana State University have carried out several studies on the life histories and feeding habits of amphibians. At Notre Dame, David Sever is working on salamanders, and at Earlham, John Iverson is working on a variety of herpetological subjects with emphasis on kinosternid turtles. Patricia G. Parker (1993) of Purdue recently reported on a study of genetic diversity in turtle populations using DNA fingerprinting. Stephen Perrill and his students at Butler University study anural vocalization and social behavior, and Daryl R. Karns and his students are involved in herpetological research projects at Hanover College. Craig Nelson (1993) reported on herpetological research at Indiana University, including the effects of temperature on sex determination in turtles, the structure of pond-breeding amphibian communities, and sensory specializations in amphibian and reptile behavior. Nelson, Michael Ewert, and their students have surveyed the herpetofauna of several areas in southern Indiana. The unique Axolotl Facility at Indiana University, established in 1957 by Rufus Humphrey, is being utilized for research on the regeneration of limbs, tissue transplantation, the biological basis for memory, and other projects. The Axolotl Facility supplies material for laboratories throughout the world. Work on amphibian and reptile ecology by Spencer Cartwright, William E. Cooper, Bruce Kingsbury, and Barry Sinervo is in progress at Bloomington and several regional campuses in the Indiana University System as well as by Robert Broadman at St. Joseph's College.

The Indiana State Museum has recently provided unique information on the State herpetofauna through the studies of J. Alan Holman and Ronald L. Richards (1993) on Pleistocene and Quaternary reptile remains from cave deposits and other sites. The museum also provides a repository for Indiana herpetological specimens. Julian Duval, formerly of the Indianapolis Zoo, and other herpetologists are carrying out studies on the biology and husbandry of West Indian iguanas (*Cyclura*), land tortoises, and other species.

Amateurs have always made major contributions to herpetology. Indeed, in American herpetology until about 1950, the line between amateur and professional herpetologists was tenuous. Angus Gaines, who published lists of the Knox County herpetofauna (1894-95), apparently was an early Indiana amateur who worked in a lumber yard for part of his life. The distinguished Indiana surgeon and astronomer, Goethe Link, was keenly interested in snakes and contributed many specimens collected near his home in Morgan County to the Chicago Academy of Science. Among amateurs now active who have contributed to our knowledge of the distribution and habits of Indiana amphibians and reptiles are Michael J. Lodato of Evansville, Dennis Brown of Indianapolis, and Paul Spicer of Fort Wayne

The chief interest of many amateur herpetologists today is the husbandry and captive breeding of interesting and attractive species such as the tri-color kingsnakes, boas and pythons, leopard geckos, African chameleons, fire-bellied toads, and arrow-poison frogs. The Hoosier Herpetological Society, established in 1987 by a group of amateur herpetologists, includes both professionals and amateurs and contributes significantly to herpetological knowledge in the State and to the education of the public concerning reptiles and amphibians. After about a century and a half, the discipline of herpetology appears to be a respectable part of science in Indiana.

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