



2007 WILDLIFE DIVERSITY REPORT





Hovey Lake, Posey County

Dear Friends:

The science and art of wildlife management in North America is fairly new. Aldo Leopold, considered the father of wildlife management, penned his classic treatise “Game Management” in 1933. Federal support for science-based conservation of birds and mammals started in 1937. Game birds and mammals, such as deer, elk, turkey and quail have benefited from this support and attention and many important wildlife management methods and concepts have been developed.

Nongame and endangered species management has a much more recent origin, starting with passage of the federal Endangered Species Act in 1973. This landmark legislation prompted states to initiate their own state endangered species programs. Indiana’s program got off the ground in 1982, with legislation allowing Indiana taxpayers to donate all or part of their income tax refund to the Nongame Fund. Building on management lessons learned from 40-plus years of game management, Indiana developed a modern science-based program for nongame and endangered species. A quarter century later, I can proudly say we’ve come a long way, baby!

This report celebrates the history and accomplishments of Indiana’s nongame and endangered species conservation program. This program has been possible only because of the support provided by Indiana citizens through direct donation or the income tax checkoff. So give yourself a round of applause and take a bow! Without your support none of these conservation efforts would have happened. Most of all stay tuned—wildlife faces great challenges, but your help allows us to prepare to meet them. On behalf of all Hoosiers and Hoosiers to come, it is my pleasure to thank you.

Sincerely,

Glen Salmon
 Director
 DNR Division of Fish and Wildlife

A Rose by Any Other Name ...

*What is in a name?
 That which we call a rose
 By any other name would smell as sweet*

*-William Shakespeare—Romeo and Juliet
 (What matters is what something is, not what it is called.)*

The state government program responsible for the care and management of native animals has evolved through the years. Along the way, the program name has changed to better reflect its role. This has confused some people.

Previous titles reflected prevailing public sentiment and

tradition. Many agencies in other states were originally called Fish and Game agencies, reflecting their emphasis on hunted species. Later, many states dropped the “game” and became “fish and wildlife” agencies. This acknowledged their greater responsibility; however, because funding for these agencies was closely linked to the sale of licenses, guns, ammunition and fishing equipment, they remained focused on game species.

In the early 1970s, as interest in endangered species grew, biologists began to work with rare species and non-hunted animals. Funding for these efforts came from non-hunting-related sources. Terminology developed as conservation programs with distinct responsibilities and funding sources tried to distinguish themselves. In Indiana,

the program responsible for all non-hunted animals and non-sport fish was originally called the Nongame and Endangered Species Wildlife Program (NEWP). While that name was accurate, studies indicated that the term “nongame” was not well understood by the public, so the Indiana program was often referred to as the Endangered Species Program.

Recently, programs of this type across the nation have started to change their titles to Wildlife Diversity. This reflects a new emphasis on preventing species from becoming endangered. In keeping with this trend, Indiana’s program is now the Wildlife Diversity Section (WDS). Whatever the name, the goal of the program has always been to maintain the biological diversity of Indiana and

the program has always been supported by donations to the Nongame Fund.

The following definitions will assist in understanding the evolution of all species conservation.

Game—Animal species pursued for food, sport or commercial purposes, (such as fur), e.g., deer, Canada goose, red fox and quail.

Nongame—Animal species not pursued for food, sport or commercial purposes, e.g., cardinal, tree frog and chipmunk.

Endangered Species—Any species whose prospects for survival or recruitment within the state are in immediate jeopardy and that is in danger of disappearing from the state, e.g., lake sturgeon, wood rat and osprey.

Special concern—Any species requiring monitoring

MILESTONES

KEY

DFW	DNR Division of Fish and Wildlife
DNP	DNR Division of Nature Preserves
DOT	Department of Transportation
FWA	Fish and Wildlife Area
FWF	Fish & Wildlife Fund
GIS	Geographic Information Systems
HNF	Hoosier National Forest
ISU	Indiana State University
NEWP	Nongame & Endangered Wildlife Program (later became WDS)
NP	Nature Preserve
NRCS	Natural Resources Conservation Service
NWR	National Wildlife Refuge
PU-DFNR	Purdue University - Department of Forestry and Natural Resources
TNC	The Nature Conservancy
WDA	Wildlife Diversity Area
WDS	Wildlife Diversity Section

1973

- State Legislature passes Indiana Nongame and Endangered Species Act.

1981

- Indiana Nongame and Endangered Wildlife Program originated with hiring of Chris Iverson as state's first nongame biologist and endangered species coordinator.

1982

- Legislation provided funds to NEWP through a state income tax checkoff. This funding source marked the actual start of NEWP.
- Nesting pair of sandhill cranes found in northeastern Indiana, first record of species nesting in state in more than 50 years.
- Three public workshops conducted to help establish program priorities.

1983

- Nongame biologist Jane Choromanski Norris (mammals) was hired.
- First great blue heron survey conducted (43 colonies identified); others conducted every 2-5 years.



Research on wild animals can be challenging. To determine the movement patterns and habitat use of bobcats, WDS captured them and fit them with radio collars, then followed them for months.



Cassie Hudson and Scott Johnson inject a woodrat with immobilization drugs.



Woodrats live in this steep rocky terrain along the Ohio River.

because of known or suspected limited abundance or distribution, or because of a recent change in legal status or required habitat, e.g., bald eagle, common mudpuppy and banded pygmy sunfish.

Species Most in Need of Conservation (SMNC)—In Indiana this term covers all of the state-endangered and special concern species listed in the Indiana Comprehensive Wildlife Strategy. Funding from the federal State Wildlife Grant program may only be used for SMNC.

WHY?

Society values wildlife and wildlife conservation for ecological, economic, esthetic, practical, recreational and spiritual reasons. In 1973, the Indiana legislature provided for the continued survival of a wide variety of wildlife species. Nine years later, legislation was passed to provide funding for this program. During the last 25 years, through the tax checkoff and direct donations, Indiana citizens have given more than \$9 million in support. This silver anniversary report provides a synopsis of the conservation efforts achieved as a result of that generosity.

Indiana's definition of "Nongame and Endangered Species Conservation"

For 25 years, a small band of dedicated scientists (with citizen support), has worked diligently to conserve Indiana's nongame and endangered wildlife. The activities of this program, currently called the Wildlife Diversity Section, have been shaped by state and federal laws, auxiliary funding sources, national conservation efforts, available talent and opportunities, and current challenges facing our wildlife.

The Program's Charge

The law, IC14-22-34, requires "The development of programs designed to ensure the continued ability of nongame species in need of management to self-perpetuate successfully."

"Management" is:

The entire range of activities that constitutes a modern scientific resource program:

- Research
- Survey and monitoring (census)
- Habitat protection (acquisition) and habitat management (improvement)
- Education (technical guidance)
- Population management (species restorations or the periodic or total protection of a species or population and regulation of take)

RESEARCH

Research starts with questions, such as:

- Why is this species declining?
- What does the optimal habitat for this species look like?
- What impact does habitat fragmentation have on this species?
- Is recovery of this species hampered by inbreeding problems or other limiting factors?



The WDS visits falcon nests and gull colonies to determine reproductive success and colony size.

- Major rivers studied for first midwinter bald eagle survey conducted in state.
- Barn owl survey and nest box management project started (3 active nests located).
- Western cottonmouth discovered by conservation officer at Buffalo Flat NP in spring.

1984

- Martha Jo Daniels hired to run NEWP information and education efforts.
- Began surveys to determine status and distribution of Franklin's ground squirrels. Range-wide survey ended in 1990.
- Sandhill crane nesting and recruitment survey started.
- Wetland bird breeding inventory conducted (rare yellow rail discovered on 2 of 8 northern Indiana wetlands surveyed).
- Provided feeders and birdseed to elderly care facilities. This 3-year project eventually served 200 facilities.
- Approximately \$240,000 contributed to Indiana Nongame Fund by more than 50,000 contributors, an 80% increase from 1983.
- Black tern status survey conducted.

1985

- First year of special projects program; 8 studies funded at total cost of \$12,000.

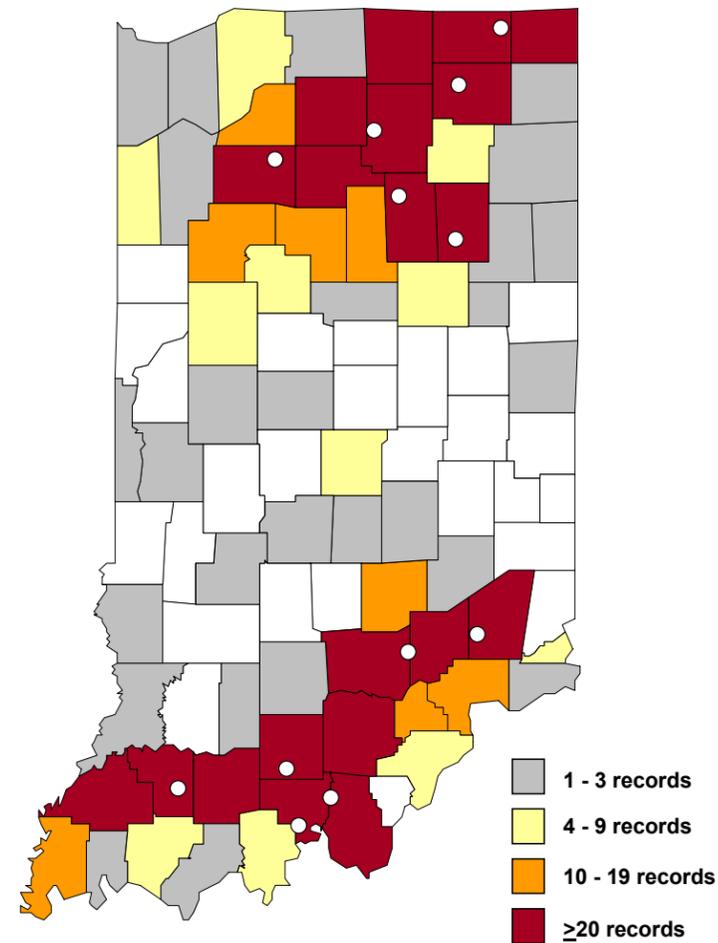
- NEWP plan developed.
- 5-year bald eagle restoration project started with 3 young eagles released in July at Monroe Reservoir.
- Indiana Breeding Bird Atlas, a 5-year project to map statewide distribution of nesting birds, started.
- Wildlife Rehabilitator Directory developed.
- Warren Gartner hired as first coordinator for Project WILD.
- Woodland nesting raptor survey started.
- Swamp rabbit decline in state; only 2 small populations identified.
- First census of Indiana bat winter hibernacula in state, NEWP continues to fund and participate in 11 subsequent censuses through 2007.
- Emergency order to close hunting season on swamp rabbits issued.

1986

- Public Affairs Unit supervised nongame public information specialist.
- Swamp rabbit listed as state-endangered.
- Deborah Fairhurst hired as nongame information specialist.
- Scott Johnson hired as nongame mammal specialist.
- Completion of Franklin's ground squirrel study showed it present in only 9 of 16 historically occupied counties.
- Funded 2-year graduate study (1986-88) of remnant swamp rabbit populations in southwest Indiana.
- Adult male peregrine falcon took up residence in downtown Indianapolis in July.
- Nesting platforms erected in Indianapolis to encourage peregrine falcon nesting.
- Assessment of the status of freshwater mussels in the Wabash River System study started; 10 live specimens of the federal endangered fat pocketbook found.
- Piping plover survey of Indiana's Lake Michigan shoreline completed. None found.
- First Indiana nesting record for the endangered least tern reported at Gibson Lake.
- Western chorus frog and western harvest mouse removed from state special concern list.

Cumulative Distribution of River Otters in Indiana, 1995 – 2006

1,630 records in 66 counties



The WDS trapping period for Franklin's ground squirrels is short because this species spends most of the year underground.

WDS staff and partners find answers

Wildlife research is challenging. Study subjects can be hard to find (fanshell mussel), mobile (Indiana bat, lake sturgeon), dangerous (rattlesnake), too small or too slippery for a radio transmitter (salamander), difficult to permanently mark (crawfish frog), live in remote places (woodrat, mole salamander) and some or all of the above. Further, their survival often depends on how well scientists understand how these animals relate to ever-changing environmental conditions. In other words, for the WDS to get the needed answers, these animals have to be studied in the wild for several years or breeding seasons.

In the last 25 years the Nongame Fund has supported more than 160 research projects carried out by WDS staff as well as faculty and graduate students from many Indiana colleges and universities. This helps develop the next generation of wildlife scientists.

Special projects use special local talent

DNR's field biologists working on nongame and endangered species have always been a small (four maximum) dedicated group with a big job. With WDS's statewide responsibilities for more than 600 nongame species in seven animal groups (mammals, birds, reptiles, amphibians, fish, mollusks and crustaceans), acquiring additional help was an early program priority.

Between 1983 and 1999, the Special Projects program accelerated the collection of information needed to develop management and conservation strategies for Indiana's rare, imperiled and understudied wildlife. Special Projects was also used for educational and geographical information projects.

The program allowed scientists and a smaller number of dedicated naturalists to submit proposals appropriate to their unique talents and skills, to provide help to the state's fledgling nongame program. During this period, 144 projects (32% research, 57% survey and monitoring and 11% education, GIS, and promotions) were funded at a cost of approximately \$450,000. Scientists from almost every college and university in Indiana participated in the Special Projects program and provided a solid science-based early foundation.

As the DFW's organization and management system evolved, the solicitation of external projects became more difficult. Research needs became more focused and external contracts resulted from specific proposal requests.

WDS still uses outside researchers or non-agency scientists today; however, to accommodate state procurement regulations and federal grant requirements, the projects tend to be larger than in earlier years and tailored to fulfill specific information gaps. Whether in the form of many small "special projects" or fewer large, multi-year studies, Indiana is fortunate to have a wealth of local talent for wildlife conservation.

SURVEY AND MONITORING

The WDS uses the term "survey" to define activities that determine the number, distribution or condition of species within a defined geographical or methodological boundary. For example, survey results can be expressed in a number of ways: as the number of bats in a particular cave, the number of snakes under five cover boards, the number of known stud fish populations in the state, or the first known nesting occurrence



Aquatic biologist Brant Fisher and students discuss fish captured during an electro-fishing demonstration.

- Backwaters Marsh (Pisgah Marsh), a 130-acre wetland/upland oak community in Kosciusko County, became first property purchased with nongame funds.
- Staff developed educational slide/tape programs on bald eagle restoration and barn owl management.

1987

- 5 nesting sites for sandhill cranes discovered.
- Started 2-year graduate study (1987-89) of habitat use and dispersal patterns of Franklin's ground squirrel in Benton County.
- "Indiana Bat Hibernating Colony" warning sign posted at hibernacula (caves) for first time.
- Least tern survey of Wabash River conducted.
- Heron Rookery (34 acres) acquired.
- Administered surveys for rare species on Crane Naval Weapons Support Center.
- NEWP became eligible for federal matching funds, pursuant to the Endangered Species Act, to support federal endangered species projects.
- "Speloggers" were installed in Indiana bat hibernacula to obtain winter visitation data.

1988

- Loggerhead shrike status and nesting ecology study started.
- Bobcat scent post station survey began.
- "Survey for the White Cat's Paw in the Maumee Drainage in Northeastern Indiana and Northwest Ohio" started.

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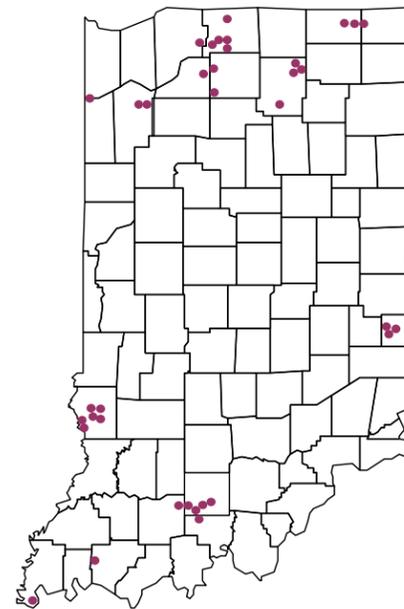
- First black tern nest found.
- Angle-iron bat gate built at Batwing Cave.
- NEWP transferred from Wildlife Section to newly created Planning, Environmental and Nongame Section within the DFW.
- NEWP sponsored first Double Eagle Run/Walk in October; annual event continues for 8 years, ending in 1995.
- Study of impact of human visitation on over-winter weight loss of hibernating Indiana bats started.

1989

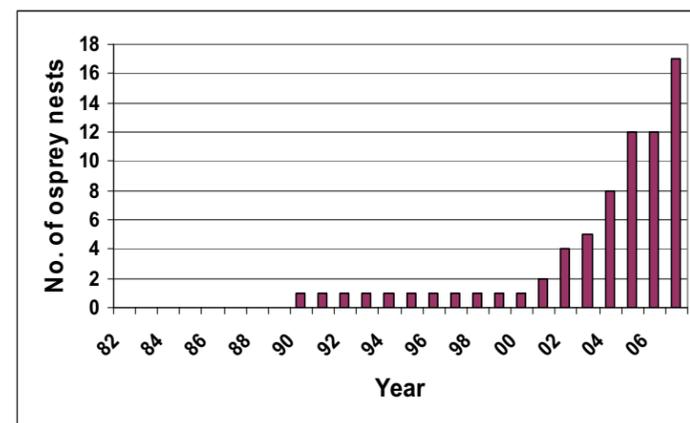
- John Castrale hired as nongame bird biologist.
- Catherine (Katie) Gremillion-Smith hired as nongame supervisor.
- Last year bald eagles hacked (gradual release process) at Lake Monroe.
- For first time in 20th century, nesting attempted in state by bald eagles.
- First fledging of peregrine falcons in state achieved.
- State bobcat report database started for collecting, consolidating, and analyzing reports of bobcats.

1990

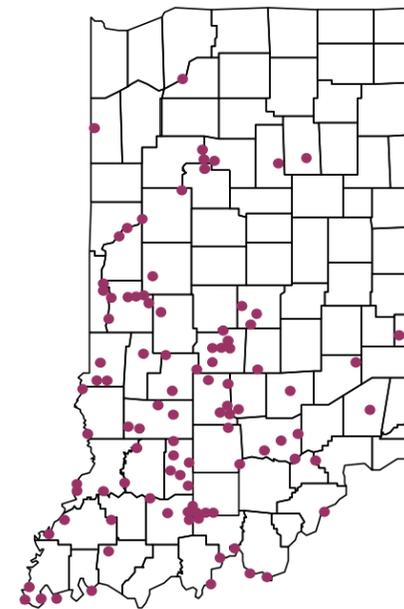
- Robert Anderson hired as nongame mussels, fish, reptile and amphibian biologist.
- Black tern nesting platforms built and deployed.
- "Eye on Wildlife" rare species report forms developed and distributed.
- 3-year study on summer habitat model for the Indiana bat in state started.
- Survey and management of interior least terns in Indiana started.
- Administered surveys for rare species at Camp Atterbury.
- Two forest wildlife projects started: "Surveys of Diurnal Woodland Raptors" and "Inventory of Summer Bat Communities on HNF."
- "Indiana's Rare Plants and Animals: A Checklist of Endangered and Threatened Species" published by DFW and DNP.
- Little Chapman Lake property (82 acres) acquired in partnership with the DNP.



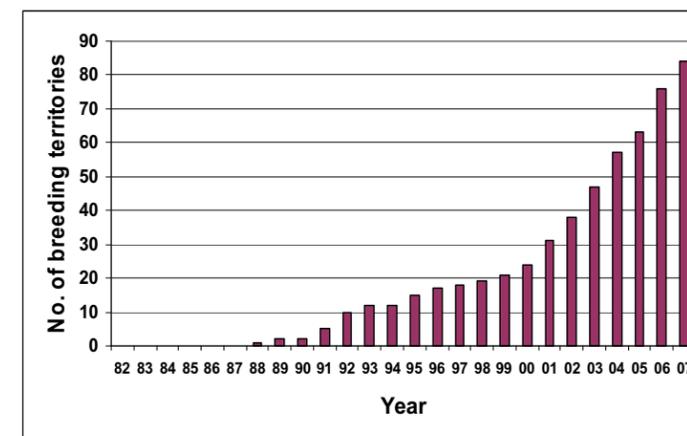
Locations of osprey pairs in Indiana, 2007



The WDS uses several techniques to survey birds, including helicopter flights for surveying eagle and osprey nesting activity and success.



Locations of bald eagle pairs in Indiana, 2007



Number of bald eagle nests. Surveys and monitoring allow biologists to determine the success of management efforts.



Whooping cranes use Goose Pond FWA during migration.



The cave salamander is one of Indiana's most colorful salamander species.

1991

- Backwaters Marsh WDA name officially changed to Pisgah Marsh WDA.
- 4-year peregrine restoration project started; 15 peregrine falcon chicks released in Indianapolis.
- First eagle chick fledged in state since the restoration.
- Started 3-year project of survey and searches for new population localities of Allegheny woodrats.
- Osprey nesting platforms erected.
- Pair of osprey attempted to nest at Brookville Lake; first in state since '70s.
- Water quality study of Fish Creek (regarding endangered white cat's paw pearly mussel) started.
- Fish Creek mussel survey started.
- Mussel season in Indiana closed by emergency rule to halt unsustainable harvest.
- Tippecanoe River mussel, fish and habitat-quality evaluation started (3-year study).
- Winter cave census for "Indiana Bat in Non-priority 1 Hibernacula in Indiana" started.
- DFW offices in Indianapolis moved to new state government building.
- Angle-iron gate built at Wyandotte Cave to protect hibernating Indiana bats.
- Gray bat population census started.

1992

- Mussel harvest prohibited indefinitely.
- Involved in Highway 37 realignment, helped design drainage to reduce threats to cavefish and karst habitats.

- Mussel surveys in Wabash, Tippecanoe and White rivers of Indiana started. This was a 4-year study to establish a population baseline for the newly closed mussel season.

- Study started on small mammal communities in barrens, old fields, and wildlife openings in southern part of state.

- Replaced fence surrounding Twin Domes Cave.

- 3-year assessment of bald eagle habitat in state began.

- First year participated in Partners in Flight.

1993

- River otter restoration feasibility study started.

- Alligator snapping turtle and harlequin darter listed as state endangered.

- Timber rattlesnake elevated from species of special concern to state endangered.

- Status survey and habitat assessment of swamp rabbit in southwest Indiana study started.

- Project WILD receives partial funding from FWF.

- First green salamander reported in state.

- NEWP and Illinois Natural History Survey produced "Field Guide to Freshwater Mussels of the Midwest."

- Franklin's ground squirrel elevated from special concern to state endangered.

- First bantam sunfish recorded in state in a tributary of the West Fork of White River.

- NEWP sponsored karst appreciation field trip for DOT staff to promote sensitive habitat's protection.

- NEWP sponsored turtle identification workshop for DNR Law Enforcement personnel.

- Amphibian and reptile survey of HNF and Bachman's sparrow survey started.

1994

- Started studies on the trade in non-listed reptiles and amphibians and the regulation of trade of non-listed reptiles and amphibians.

- Franklin's ground squirrel status survey conducted.

- Surveyed candidate endangered reptiles and amphibians in Fish Creek watershed.



Southern redbelly dace



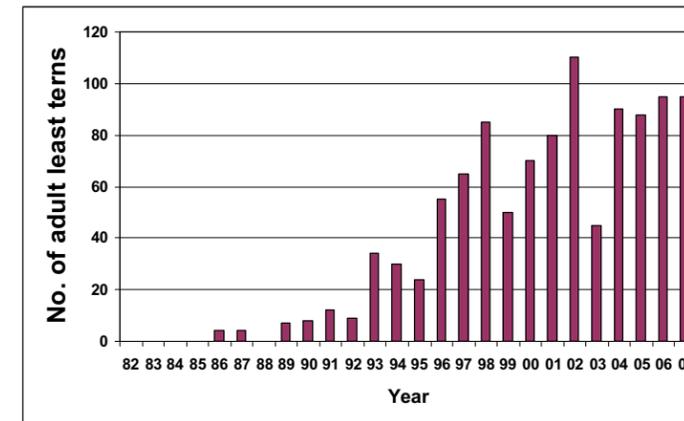
Eastern fence lizard



Indiana has a diverse mussel community. Many people do not notice these "living rocks" on stream bottoms, even when female mussels display a lure to attract a fish host to carry their larva. Mussel beds can be quantitatively surveyed and mussels marked for study.



Locations of peregrine falcon pairs in and bordering Indiana during 2007



of Caspian terns in Indiana. Monitoring, on the other hand, is intended to detect changes in the number, distribution or demographics of a species. For instance, monitoring results can be expressed as the number of historic and new counties occupied by Franklin's ground squirrel, changes in juvenile mussels per sample in the Tippecanoe River or the spread of an exotic invasive species.

Survey and monitoring activities form the backbone of many WDS activities. This information is a vital first step in wildlife conservation, which along with a threat assessment, is an important component for determining a species' legal status. Species status is determined by a combination of survey and monitoring.

Endangered species are, by definition, few and far between. Trying to find them is akin to looking for the proverbial needle in a haystack, except the haystack is enormous and the needle moves.

Survey and monitoring activities can also apply to different habitats. The distribution, degree of fragmentation, and connectivity of various habitat types are important characteristics that require monitoring, which is often done using satellite pictures.



Populations of northern leopard frogs (a species of special concern) started to decline for unknown reasons in the early 1970s.

- Harlequin darter survey ended.
- Study of distribution and status of Indiana crayfish completed.

- Provided partial support to Indiana's gap analysis project.

- Live fanshell mussels found in Tippecanoe River and East Fork White River during survey of former commercial harvest area.

- Partners in Flight contributed \$20,000 in studies of forest and grassland birds.

- In-holding at the Little Chapman Lake Nongame Area purchased.

- River otter status elevated from extirpated to state endangered, in support of upcoming restoration.

- Pisgah Marsh addition (177 acres) purchased in partnership with the FWF.

- Blanding's turtle added to state endangered list.

- Temperature and humidity probes installed at 5 Indiana bat hibernacula (caves).

1995

- Record number of 13 bald eagle pairs laid eggs, 3 in newly found nests. Range of species expanded to include nests on Wabash River and East Fork of White River.

- Least bittern, trumpeter swan, ornate box turtle and green salamander added to state endangered list.

- Successful peregrine falcon nest discovered in Indianapolis (4 fledglings).

- Record number of eagles counted, 132 bald and 3 golden, on midwinter survey.

- First river otter release (25 otters) at Muscatatuck NWR in January.

- Brant Fisher hired as nongame aquatic biologist.

- Kathy Quimbach hired as nongame information specialist.
- Division GIS technician retained to develop Indiana managed-area database.

1996

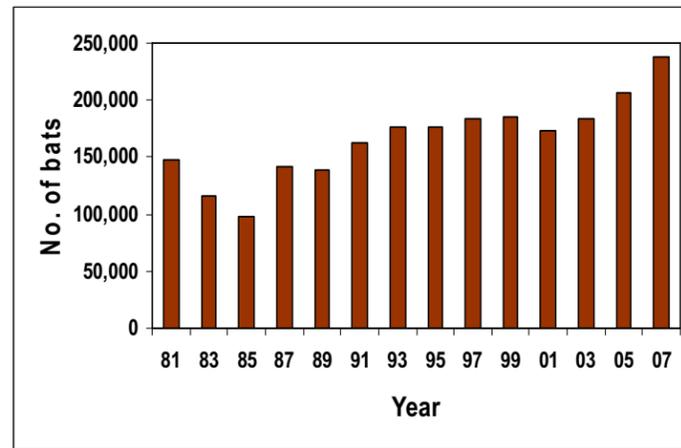
- NEWP moved to the new Wildlife's Habitat and Diversity Protection unit.
- River Otter Sponsorship Program started for the duration of the release phase of the restoration.
- Study of population status of hellbender started.
- Monitoring zebra mussel release from Lake Maxinkuckee into Tippecanoe River began.
- Endangered mussel monitoring and recovery done in Ohio River.
- Mussel surveys done in Salamonie and Mississinewa rivers.
- Cost-shared studies done of Pigeon River ecosystem, focusing on spotted turtle, Blanding's turtle and eastern massasauga.
- Initiated studies of lake sturgeon in East Fork White River.
- Surveys done to determine mosquitofish distribution and access impacts.

1997

- New population of northern studfish discovered in West Fork of White River basin.
- Newly rediscovered redbreast dace populations surveyed in Union and Wabash counties.
- Record number of interior least terns found nesting at Gibson Lake.
- Spotted darters found in East Fork White River, a first for that drainage.
- Ecological studies of timber rattlesnake in southern Indiana started.
- Conducted study on status and distribution of badgers.
- Conducted study on status and distribution of northern cavefish.
- Expanded colonial waterbird nesting surveys from great blue herons to include egrets, gulls, terns, night herons and cormorants.

1998

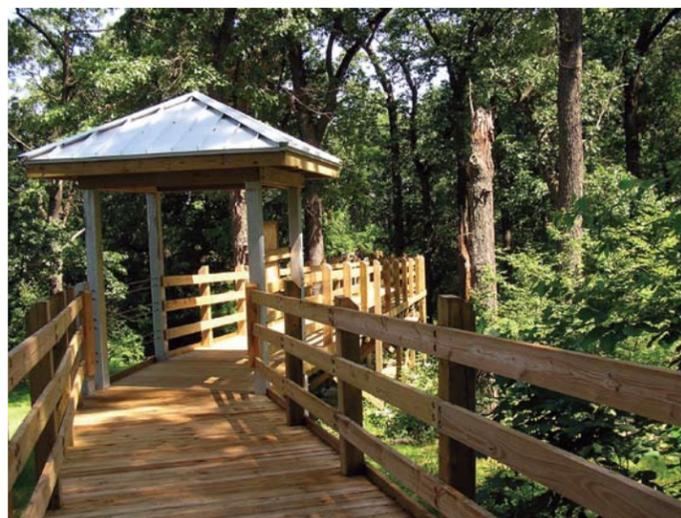
- Freshwater mussel surveys in northern Indiana's natural lakes started.
- Greater redhorse elevated to state endangered.



Indiana bat winter populations: Hibernating Indiana bat numbers are increasing in our state, partly a result of protection of their hibernacula.



Aerial view of Pisgah Marsh WDA, Kosciusko County



The quarter-mile, ADA-accessible boardwalk at Pisgah Marsh WDA makes wildlife viewing available to Hoosiers without disturbing the wildlife.

LAND ACQUISITION

This is one of the most effective ways to protect land for wildlife. Not only is the land spared from development, but habitats can be managed to benefit selected species. DNR only purchases land from willing sellers. These transactions can be complex and prolonged. All land purchases, except those completed at a land auction, require an appraisal.

The WDS may only purchase land at or below the appraised value. Potential acquisitions must provide habitat to one or more species most in need of conservation as listed in the Indiana Comprehensive Wildlife Strategy. Priorities are given to large parcels or those near other protected lands. Small parcels that provide exceptional benefit to imperiled species are also highly rated. As the budget allows, the WDS purchases land. Under some circumstances the WDS accepts land as a gift or bequest.

Here are examples of acquired land:

Heron Rookery (HR), 34 acres in St. Joseph County, consists of a woodlot of mature trees, mostly beech, that supports approximately 150 great blue heron nests.

Little Chapman Lake (LCL), 82 acres in Kosciusko County, purchased with the DNP. On the shoreline of the lake, this property is a dedicated nature preserve that contains a bog and provides habitat for a variety of birds and snakes.

Pisgah Marsh WDA (PM), 631 acres in Kosciusko County, purchased in four parcels from 1985-2006. The wetland/upland complex of glacial origin provides habitat for a wide variety of rare wildlife. A quarter-mile-long elevated boardwalk facilitates wildlife viewing.

Goose Pond (GP), 8,000 acres in Greene County enrolled in the NRCS Wetland Reserve Program. Through federal grants the WDS contributed \$1.8 million (≈22 % of the purchase price) to this major wetland complex. Goose Pond provides habitat for many game species, crawfish frogs (SE) and thousands of nesting and migrating shorebirds, wetland birds and waterfowl. Goose Pond is a premier birding site.

Ashcraft Cave (AS), 1.2 acres in Greene County, bequeathed to the state. The property contains the entrance to a small cave that supports cave invertebrates and bats, occasionally including Indiana bats.

Swamper Bend (SB), 108 acres located in Knox County, provides bottomland hardwood habitat for the state-endangered swamp rabbit.

Tern Bar Slough (TBS), 840 acres in Gibson County, enrolled in the NRCS Wetland Reserve Program. A portion of the property has been developed to provide nesting habitat for the interior least tern. The remaining 600-plus acres is being restored to wetlands and bottomland hardwood forest. TBS is closed to public use until restoration is complete in 2010. Limited hunting will eventually be allowed, especially to control deer during forest development. TBS is also expected to be an excellent birding site.

Heritage Trust Partnership Properties

(The Nongame Fund or State Wildlife Grants contributed to the purchase of these properties)

- McCloud Nature Park, Hendricks County
- Bob Kern Nature Preserve, Fulton County
- Lake Manitou Island Nature Preserve, Fulton County

- Survey on endangered darter started.

- Started 4-year population dynamics study of Allegheny woodrats.

- Popeye shiner de-listed as endangered; previously thought extirpated from state.

- Peregrine falcon nesting site discovered in Jasper County.

- Black rail and Virginia rail listed as state endangered.

- 5-year population study of bobcats started.

- Published "Atlas of Breeding Birds of Indiana."

- Started rare fish surveys in near-shore zone of Lake Michigan.

- Completed southwest Indiana darter survey (spottail darter).

- Survey of loggerhead shrike population started.

1999

- Release phase of river otter reintroduction finished; 303 released.

- Staff involved in TNC's Ecoregional Planning Initiative.

- NEWP bird biologist named state co-coordinator for federal breeding bird survey.

- Peregrine falcon de-listed as federal endangered.

- Tippecanoe darters discovered in main stem of Wabash River.

- Pisgah Marsh addition in Kosciusko County (179 acres) acquired.

- Swamper Bend, 108 acres of bottomland hardwoods in Knox County, acquired; was discovered to support a remnant swamp rabbit population.

- New administrative rule made to protect Indiana's native reptiles and amphibians.

- Participated in four bird initiatives: Partners in Flight, U.S. Shorebird Conservation Plan, North American Colonial Waterbird Conservation Plan and Important Bird Areas.

2000

- Coordinated North American amphibian monitoring program in Indiana; volunteers drove predetermined routes and reported calling frogs and toads.

- 5 new eagle nests discovered; a record 35 eaglets reached flight stage.

- First sign seen of recent lake sturgeon reproduction in East Fork White River.
- Contributed to purchase of Lake Manitou NP in Fulton County and its wetlands, upland oak and hickory stands, lake frontage and agricultural fields.
- Supported development of Land Management Guidelines for Copperbelly Watersnakes and other Rare Herps in Southwest Indiana.

2001

- "Snakes of Indiana" published.
- Untimely passing of Kathy Quimbach saddened a depleted NEWP team.
- Systematic statewide eastern sand darter survey started.
- Midwinter eagle survey showed a record 280 bald eagles.
- Contributed \$5,000 toward purchase of the 233.5-acre McCloud Nature Park on Upper Big Walnut Creek in Hendricks County.
- Federal funding made available to states for first time through Wildlife Conservation and Restoration Program, allowing Indiana to receive \$851,000 after first spending \$1.2 million on eligible projects.

2002

- Alisha Schiffler hired as public information specialist.
- New eastern sand darter populations found in Greene, Bartholomew and Jennings counties.
- Rough green snake listed as special concern.
- Osprey nests discovered at Patoka Lake and Hovey Lake FWAs.
- Record 110 adult least terns counted at Gibson Lake power plant.

2003

- "Wildlife Diversity Section" title acquired.
- Zack Walker hired as reptile and amphibian biologist (herpetologist).
- Six bat species listed as state special concern: little brown bat, northern long-eared bat, silver-haired bat, eastern pipistrelle, red bat and hoary bat.
- 4-year osprey reintroduction started with release of 16 at Patoka Lake and Tri-County FWAs.
- Lake sturgeon telemetry study started.



Adult least tern



Islands were constructed at Tern Bar Slough WDA to mimic the natural river sandbar nesting habitat of nesting least terns to attract the birds.

HABITAT MANAGEMENT

Normal vegetation succession, invasive exotic species, excessive human disturbance and wetland or grassland conversion can diminish the value of wildlife habitat. Habitat management activities implemented by the WDS seek to address these concerns and increase the capacity of the property to support wildlife.

For example, in partnership with the Natural Resources Conservation Service, more than 600 acres of wetlands were re-created on TBS in Gibson County and a bottom-land hardwood forest is being re-planted on the same site. Additionally, small islands that mimic river sandbars were created on TBS and are being maintained in an un-vegetated state to attract nesting interior least terns.

Elsewhere, the WDS constructed a quarter-mile-long boardwalk at Pisgah Marsh, a 100-acre wetland-oak community in Kosciusko County. Pisgah Marsh, the first property purchased by the WDS, provides habitat for a

vast array of sensitive, wetland-dependent wildlife. The boardwalk provides visitors with unique opportunities to view these species while limiting human activity to a small area and minimizing disturbance to wildlife.

TECHNICAL ASSISTANCE

The current WDS staff has, collectively, more than 18 years of postgraduate college education and 80 years of professional experience.

The WDS answers questions from Hoosiers of all ages, other state and federal government agencies, colleges and universities, consulting firms, conservation organizations, utilities, transportation agencies and businesses, to name a few. The WDS presents information through classroom presentations, pamphlets, scholarly publications, popular articles, interviews, Web sites, field trips, correspondence and annual reports.

The WDS continues to seek ways to efficiently provide information to the public. Check out wildlife.IN.gov and click on the eagle for the latest information on programs and activities.

SPECIES MANAGEMENT

This includes the direct manipulation of animal populations in order to influence (usually increase), their size. The four major restorations carried out by the WDS (bald eagles, peregrine falcons, river otters and osprey) have successfully increased the number of these animals in Indiana. Other species management projects include augmentation of Indiana's isolated, genetically depressed woodrat population, area treatments to reduce incidences of raccoon roundworm (a fatal parasite of woodrats), deployment of nest structures for peregrine falcons and osprey, and exotic lizard control.

Restorations capture the public's attention but can, unfortunately, give people a false sense of conservation power. The WDS is proud that Indiana's citizens can see eagles, falcons, otters and osprey again, but restoration attempts are not always successful.

Such efforts work only under a set of complex conditions, including but not limited to: correction of the limiting factor(s) that originally caused the decline, availability of animals suitable for release (without harming the donor population), existence of and access to appropriate habitat, and environmental and public support to ultimately establish a self-sustaining population.

Habitat loss and degradation are not easily corrected. The ability to raise animals in captivity does not mean that self-sustaining populations can always be restored in the wild. Wildlife restoration is a powerful conservation tool, but the WDS knows its limitations and therefore places high priority on protecting existing populations and their habitats.

Activities aimed at eliminating harmful or undesirable exotic animal species are at the other end of the spectrum. The most damaging exotic species are aggressive and have high reproductive potential and survivorship. Once one of these organisms establishes itself, eliminating it can be almost impossible. Exotic species often out-compete native species and, in some cases, can be the ultimate cause of a native species' decline or local extinction. Prevention is the most cost-effective and successful way to deal with exotic species management.



Indiana is home to at least five species of burrowing crayfish. Crayfish burrows provide shelter for many species of frogs, snakes and insects.

- Re-evaluation of mussel populations started 10 years after first postseason closure study.
- Green tree frogs documented for the first time in state and added to list of state's native amphibians.
- 840-acre Tern Bar Slough purchased in Gibson County. The property was under an NRCS wetland reserve easement and is planned to be restored primarily to forested wetlands.
- 45 active eagle nests found in state; record 63 eaglets reached flight stage, beating previous year's mark.
- 11 pairs of peregrine falcons nested; record 33 chicks fledged.
- New least tern area discovered in Spencer County.
- Development of Indiana's Comprehensive Wildlife Strategy initiated.

2004

- Sandhill crane de-listed as state endangered.
- Kacie Ehrenberger hired as staff specialist.
- "Track a Bobcat" project allowed citizens/students to receive bi-weekly locations of their assigned bobcat.
- Snapping turtle survey started to determine if species needed more legal protection.
- Timber rattlesnake survey started.
- Ornate box turtle survey started; despite concerted effort, no turtles found in their southern Indiana historic range.
- Box turtle survey started.
- Mole salamander populations documented for first time in state by Purdue researchers.
- DFW's first ADA-accessible boardwalk opened at Pisgah Marsh.

- New administrative rule made it illegal to possess eastern box turtles.
- Common moorhen, bantam sunfish, pallid shiner, channel darter, and northern brook lamprey listed as state endangered.
- De-listed as state endangered: Bewick's wren, Bachman's sparrow, bluebreast darter, spotted darter, spottail darter, Tippecanoe darter, and harlequin darter.
- Eastern sand darter removed from state special concern list as a result of survey.

2005

- Crawfish frog surveys started.
- Mole salamander surveys began.
- Wall lizard control program launched to eliminate this exotic species from state.
- Franklin's ground squirrel surveys started, with plan to conduct about every 10 years.
- Lake sturgeon reproduction verified in East Fork White River; larval lake sturgeon taken below William's Dam.
- 206,610 Indiana bats counted, (13 % increase) during bi-annual hibernacula survey.
- 62 active eagle nests produced 87 young. Recovery goal of 50 active pairs over 3 consecutive years for bald eagles met and exceeded.
- 12 pairs of peregrine falcons nested.
- Check of barn owl boxes revealed a record 18 nest sites.
- WDS provided \$1.8 million toward purchase of 8,000-acre Goose Pond.
- Partnered with TNC to purchase 168-acre Bob Kern NP, on Lake Manitou in Fulton County.
- Bobcats, badgers and river otters de-listed as state endangered; remained protected species.
- Second edition of the Indiana Breeding Bird Atlas project started (2005-2010).
- Public information specialist position vacated.

2006

- Added 185 acres, mostly uplands, to Pisgah Marsh in Kosciusko County.
- Indiana Comprehensive Wildlife Strategy received federal approval.



WDS aide Heather Walker attaches a radio collar to an anesthetized bobcat.



WDS aide Cassie Hudson weighs a recently captured Allegheny woodrat.

FUNDING

*Thank you very much!
Thank you very much!
That's the nicest thing that anyone's ever done for us!*
-Tom Jenkins—"Scrooge the Musical"

Nongame Fund donations

In 1982 the Indiana General Assembly passed IC 6-8.1-9-4. This allowed for the donation of all or part of an individual's income tax refund to the Nongame Fund. Direct donation, especially through the tax checkoff, provides the funding to support nongame and endangered species conservation in Indiana. For 18 years the Nongame Fund was almost the sole support for work included in this anniversary report. For the last seven years, the Nongame Fund has provided the required state match, which has allowed the WDS to access millions in federal funds.

From 1882 to 2007, Indiana citizens have voluntarily contributed more than \$9.5 million through income tax checkoffs and direct donations, including those from a regular number of avid supporters.

Federal Funding Sources, 1982-2007

Department of Defense—funding for survey and monitoring on Indiana military bases
U.S. Environmental Protection Agency—with Division of Nature Preserves
U.S. Forest Service
Challenge Grant
U.S. Fish and Wildlife Service

- Endangered Species Grants (Section 6)—also available to the Division of Nature Preserves
- Land Owner Incentive Program (no longer available)
- Wildlife Restoration and Conservation Program (currently not available)
- **State Wildlife Grants**

Since 2001, the availability of federal funds has had a big impact on the conservation efforts conducted by the WDS. The acceptance of Indiana's Comprehensive Wildlife Strategy (ICWS) in 2006 secured Indiana's continued eligibility for these federal funds. As with other federal aid to wildlife programs, the federal funds come to the state as reimbursements.

The federal reimbursement process requires several steps including:

- planning,
- development of grant documents that describe in detail the proposed conservation action,
- federal review of the grant documents to confirm the proposed action is eligible, and
- state expenditure of funds and, upon verification of expenditure and project progress, partial federal reimbursement from Indiana's apportionment.

Federal support has allowed Indiana to conduct larger projects and to work with partners on conservation actions such as land acquisition, research and statewide survey projects.

Indiana's State Wildlife Grant Allocation		
Year	Amount	Match Ratio Federal /State
2001*	851,045	75/25
2002	1,364,676	75/25 & 50/50**
2003	1,014,232	75/25 & 50/50
2004	1,076,313	75/25 & 50/50
2005	1,091,906	75/25 & 50/50
2006	1,061,073	50/50
2007	1,068,451	50/50
Total	7,527,696	

* Wildlife Conservation and Restoration Program
** 75/25 for planning projects and 50/50 for implementation projects

Indiana's federal aid allocation for species most in need of conservation

THE FUTURE

Challenges and Opportunities

Organisms that survive during changing times do so because of their ability to successfully adapt to new conditions. This is



Mammalogist Scott Johnson with a newly captured Franklin's ground squirrel from a prairie grassland associated with a railroad right of way in Northwest Indiana.

- Banded pygmy sunfish found in state for first time.
- Osprey releases completed at Jasper-Pulaski and Minnehaha FWAs; one osprey with a satellite transmitter tracked to Cuba.
- Lake sturgeon genetic study completed at PU-DFNR; East Fork White River population found to be genetically unique.
- Northern red salamander and green salamander survey started.
- Indiana started participating in nongame bird issues through Mississippi Flyway Council Nongame Bird Technical Section.
- Number of confirmed green tree frog sites in state tripled.
- A population of four-toed salamanders discovered at Tri-County FWA.
- Started studies on population genetics of Allegheny woodrats and their population-limiting factors, with partners PU-DFNR and TNC.

2007

- The study "Assessment of the Role of Interstate Highways as Barriers to Gene Flow and Metapopulation Persistence in Mammals from Indiana" started with partner PU-DFNR.
- Alligator snapping turtle survey started.
- Staff specialist position vacated.
- Partnership with ISU supported bat marking registration center.
- DNA sequence of lake sturgeon populations started for ascertaining sex determinant mechanism for this ancient fish.



State-endangered Blanding's turtles are easily distinguished from other turtles by their bright yellow throat.

- Biologists participated in Hoosier Ecosystem Experiment.

- Worked with state chemist office to protect sensitive species and sites from agricultural chemicals.

- 54 Allegheny woodrats collected from non-threatened populations in Tennessee and Kentucky released into formerly occupied habitats in Indiana.

- 238,008 Indiana bats counted in 22 caves during biennial winter census.

- Construction completed at Tern Bar Slough WDA in Gibson County. Planned to start tree and grass planting in 2008.

- Northern brook lamprey and banded pygmy sunfish surveys started.

- Construction initiated on tern nesting island at Goose Pond FWA.

- Completed first aerial survey of osprey nests; 15 of 17 nests successful, with 40 young ospreys produced.

- Two Lake Michigan shoreline sites surveyed for colonial waterbird colonies; six species breeding, including 409 Caspian terns, 255 black crowned night-herons and 62 great egrets.

- Bald eagle habitat model indicated potential for eagle population expansion into northeast Indiana.

- River otters confirmed in 68 Indiana counties (restoration started in 1995).

- Bald eagles de-listed as federal endangered.

- 35 bobcat mortalities documented in state.

true not only for plants and animals, but also for organizations, governments and businesses. These are changing times for Indiana; our human population is growing, exotic species such as the emerald ash borer and gypsy moth are altering native habitats, and climate change and energy demands may change the crops Hoosier farmers grow.

The WDS will continue traditional activities and modify them as needed to address current issues and research questions. Additionally, the WDS will take on an exciting new role as facilitator, coordinator and recorder of all conservation efforts in Indiana. The plan is to meet these new challenges and assist all of Indiana's partners in optimizing conservation opportunities.

What is ICAP?

ICAP stands for the Indiana Conservation Action Plan. It is a Web-based, user-friendly, searchable database for capturing information about natural resources conservation efforts in Indiana. Although data input is restricted to individuals or organizations authorized by their particular organization or project group, anyone with Internet access will be able to view the database.

Data entry is facilitated by simple menu instructions and dropdown boxes. The DFW will have its projects available for public viewing when ICAP launches in summer 2008.

The ICAP is being developed to:

1. Compile all conservation activities conducted in Indiana.
2. Facilitate the development of partnerships.
3. Facilitate information transfers relative to new techniques, programs and species status.
4. Identify information needs and gaps in conservation efforts.

THE WDS NEEDS YOU

Many organizations, agencies and individuals contribute to wildlife conservation in Indiana. The WDS is preparing ICAP to make conservation more efficient and effective. Its success depends upon the combined effort of everyone interested in natural resource conservation in Indiana. For an organization outline of ICAP, see the WDS Web site, wildlife.IN.gov.



Water lilies are visible in this autumn view across the lake at Pisgah Marsh WDA.

LIST OF STATE-ENDANGERED AND SPECIAL-CONCERN SPECIES

AMPHIBIANS

Endangered

Crawfish frog
Four-toed salamander
Green salamander
Hellbender
Red salamander

Special Concern

Blue-spotted salamander
Eastern spadefoot
Common mudpuppy
Northern leopard frog
Plains leopard frog
Northern Cricket Frog

BIRDS

Endangered

American bittern
Barn owl
Black rail
Black tern
Black-crowned night-heron
Cerulean warbler
Common moorhen
Golden-winged warbler
Henslow's sparrow
King rail
Kirtland's warbler*
Least bittern
Least tern*
Loggerhead shrike
Marsh wren
Northern harrier
Osprey
Peregrine falcon
Piping plover*
Sedge wren
Short-eared owl
Trumpeter swan
Upland sandpiper
Virginia rail
Whooping crane*
Yellow-crowned night-heron
Yellow-headed blackbird

Special Concern

Bald eagle
American golden-plover
Black-and-white warbler
Broad-winged hawk
Buff-breasted sandpiper
Common nighthawk
Great egret
Greater yellowlegs
Hooded warbler
Mississippi kite
Red-shouldered hawk
Ruddy turnstone
Sandhill crane
Sharp-shinned hawk
Short-billed Dowitcher
Solitary sandpiper
Western meadowlark
Whip-poor-will
Wilson's phalarope
Worm-eating warbler

FISH

Endangered

Bantam sunfish
Channel darter
Gilt darter
Greater redhorse
Lake sturgeon
Northern brook lamprey
Cavefish
Northern cavefish
Pallid shiner
Redside dace
Variegated darter

Special Concern

Banded pygmy sunfish
Bigmouth shiner
Cisco
Cypress darter
Lake whitefish
Longnose Dace
Longnose sucker
Northern madtom
Ohio River muskellunge

Pugnose shiner
Slimy sculpin
Spotted darter
Tippecanoe darter
Trout-perch
Western sand darter

MAMMALS

Endangered

Allegheny woodrat
Evening bat
Franklin's ground squirrel
Gray myotis*
Indiana myotis*
Swamp rabbit

Special Concern

Badger
Bobcat
River otter
Southeastern myotis
Eastern pipistrelle
Eastern red bat
Least weasel
Northern myotis
Plains pocket gopher
Pygmy shrew
Rafinesque's big-eared bat
Silver-haired bat
Smoky shrew
Star-nosed mole

MOLLUSKS

Endangered

Clubshell*
Eastern fanshell*
Fat pocketbook*
Longsolid
Northern riffleshell*
Orangefoot pimpleback*
Pink mucket*
Pyramid pigtoe
Rabbitsfoot
Rough pigtoe*
Sheepnose **

Snuffbox
Tubercled blossom*
White catspaw*
White wartyback*

Special Concern

Ellipse
Kidneyshell
Little spectaclecase
Ohio pigtoe
Purple lilliput
Rayed bean ***
Round hickorynut
Salamander mussel
Wavyrayed lampmussel
Campeloma decisa
Lymnaea stagnalis

REPTILES

Endangered

Alligator snapping turtle
Blanding's turtle
Butler's garter snake
Copperbelly water snake **
Cottonmouth
Eastern mud turtle
Heiroglyphic river cooter
Kirtland's snake
Massasauga ***
Ornate box turtle
Scarlet snake
Smooth green snake
Southeastern crowned snake
Spotted turtle
Timber rattlesnake

Special Concern

Western mud snake
Rough green snake
Western ribbon snake
Eastern box turtle

* federal endangered
** federal threatened
*** federal candidate



HOW TO DONATE

The Indiana Wildlife Diversity Section invites you to play an active role in conserving Indiana's nongame and endangered wildlife. This program is funded through public donations to Indiana's Nongame Fund. The money you donate goes directly to the protection and management of more than 750 wildlife species in Indiana—from songbirds and chipmunks to state-endangered barn owls and spotted turtles. You can help Indiana's wildlife by looking for the eagle logo and the line provided on your Indiana state tax form to donate all or part of your refund. To donate directly, please write to:

Nongame Fund
402 W. Washington St. Rm. W273
Indianapolis, IN 46204

STAFF

Rob Carter, DNR director

Glen Salmon, DFW director

Catherine (Katie) Gremillion-Smith, WDS chief

Indianapolis
(317) 232-8160
kgsmith@dnr.IN.gov

Brant Fisher, aquatic biologist

Edinburgh
(812) 526-5816
bfisher@dnr.IN.gov

John Castrale, avian biologist

Mitchell
(812) 849-4586
jcastrale@dnr.IN.gov

Scott Johnson, mammal biologist

Bloomington
(812) 334-1137
sjohnson@dnr.IN.gov

