



**INDIANA AUDUBON QUARTERLY**  
**VOL. 96, NO. 4. NOVEMBER 2018**

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# INDIANA AUDUBON QUARTERLY

(Formerly the Indiana Audubon Society Yearbook)

Published in February, May, August and November by

The Indiana Audubon Society, Inc.

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**Visit our website at [www.indianaaudubon.org](http://www.indianaaudubon.org)**

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**Cover photo:** Red-necked Phalarope at Wakarusa Treatment Plant, Elkhart Co. Photo taken by Carol Goodall. 01 October 2018.

**Back cover photo:** Third state record White-tailed Kite at Reynolds Creek GHA, Porter Co on 19 May 2018. Photo by Ryan Sanderson.

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# Little Birds, Big Feats

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*Editor's Note: The following originally appeared in an Amos Butler Audubon publication in 2003. Mr. Casebere shared this article with IAS, as it's as much relevant today, as it was fifteen years ago, when it was originally written.*

Back in the 1970's when I was living in Fort Wayne, my friend Mark Weldon and I spent countless hours at Pigeon River Fish & Wildlife Area in LaGrange and Steuben Counties. We were inquisitive young naturalists always eager to find something new or different, and of all the places we knew of in northeastern Indiana, Pigeon River suited us best. Our field pursuits focused mostly on birds, reptiles, amphibians and plants, and because of its size and diversity, Pigeon River had the best potential for turning up exciting finds.

We especially liked exploring for birds there during the summer months because it hosted many unusual breeding species for that corner of the state. Some were near the northern limits of their ranges, and some near the southern limits. Finding nesting evidence of those peripheral species was always exciting, and we worked hard at trying to make those discoveries. Over a period of several years, we found nests of southern species like Hooded Warbler and White-eyed Vireo, and northern species such as Least Flycatcher, Chestnut-sided Warbler, Canada Warbler, and Veery. Even though we were unable to document breeding, we found summering individuals of several other peripheral species including northern birds like Blackburnian Warbler, Mourning Warbler, and Golden-winged Warbler, and southern birds such as Kentucky Warbler and Louisiana Waterthrush.



In 1973, the American Ornithologists Union split what had been known as Traill's Flycatcher into two separate species, Willow Flycatcher and Alder Flycatcher. They are two very similar species most easily distinguished not by visual differences, but by differences in their songs. Willow Flycatcher was known to nest virtually statewide, but the Alder, a more northern species, was not known to summer in Indiana. Surprisingly, Jim Haw found Alder Flycatcher summering at Pigeon River in 1974. From then until I moved to Indianapolis in 1980, Mark and I searched for a nest of Alder Flycatcher in Indiana. In the process, we turned up many nests of Willow Flycatcher, but alas, none of Alder. After moving to Indianapolis, the long drive to northeastern Indiana, as well as devoting more time to botany and photography, kept me from seriously continuing the search. The task of finding an Alder Flycatcher nest would be left for someone else closer by, I thought. No one ever did.

Before the 2001 breeding season, Don Gorney and I were discussing discoveries yet to be made in Indiana and finding an Alder Flycatcher nest came up in the conversation. We decided it was time for the search to get serious again, and that we should be the ones to try. Come summer, we took up the task, and to make a long story short, we did it. We found not one, but two nests of Alder Flycatcher. The discovery, we agreed, should be documented in the “Indiana Audubon Quarterly,” so we went about researching references and writing up details.

In the process, we discovered a paper written by Lawrence Walkinshaw for “Bird Banding” in 1971 in which he describes a female Traill’s Flycatcher (it was a Willow Flycatcher by today’s standards) that he banded as an adult. Subsequent recaptures confirmed that she spent summers in that same wetland for at least seven years. Seven years! She braved the elements and the night skies of autumn and spring on journeys to Central America and back, returning precisely to the same piece of marshy habitat at Baker Sanctuary, Convis Township, Calhoun County, Michigan, U.S.A. There, she spent the summer months engaged in pair bonding, nest building, mating, egg laying, incubation, and raising of young. For five years straight, she built her neatly constructed, downy nest in the same clump of dogwood shrubs! All this from a little greenish bird, not quite six inches from tip of beak to end of tail.



**Alder Flycatcher, Hatch Year bird identified by narrow and tapered retrices.**

Bird migration is an awesome phenomenon. Twice a year as we sleep, millions of small birds navigate the starry heavens en route to far away destinations. Many cross the Gulf of Mexico where stopping to rest is not an option. No motorized conveyance carries them. No GPS guides them. Ornithologists delve into these mysteries, but it is impossible to condense their incredible magnitude into a brief explanation. Simply stated, it is little birds performing big feats, responding to the tug of urges beyond the full realm of our understanding.

Although large birds such as geese and cranes may live a very long time, small birds with high metabolisms live short lives. Walkinshaw’s little flycatcher had beaten the odds. Knowing details about the length of its life and precisely where it spent a few months each summer is incredibly exciting. Such knowledge gives us a clearer understanding and appreciation of events that link places like Baker Sanctuary in Michigan to distant Central American landscapes. It helps us form better perspectives as to what is truly important. As a serious birder, I know all too well how easy it is to get caught up in the identification games that people play. Ticking off another lifer becomes a ridiculously passionate pursuit, one in which I admittedly participate.

In her book *Sense of Wonder*, Rachel Carson cautions us about such pursuits, and at the same time, hints at larger matters by using the mystery of migration to direct our thoughts:

*"I think the value of the game of identification depends on how you play it. If it becomes an end in itself, I count it of little use. It is possible to compile extensive lists of creatures seen and identified without ever once having caught a breathtaking glimpse of the wonder of life. If a child asked me a question that suggested even a faint awareness of the mystery behind the arrival of a migrant sandpiper on the beach of an August morning, I would be far more pleased than by the mere fact that he knew it was a sandpiper and not a plover."*

I strive to let her words direct my pursuits. They are always in mind as I sort through the Least and Semipalmated Sandpipers in flocks of shorebirds hoping to find a White-rumped or a Baird's Sandpiper, or as I trot off to some far corner of the country to add more lifers to my list. My friend Emma Pitcher is intimately aware of bird migrations, and she, too, has experienced the return of birds she has banded. Eloquent words from her book *Of Woods and Other Things* speak volumes about the accomplishments of little winged creatures:

*"Every ornithological text describes migration and explains many theories of its how and why, even mentioning a migrant's ability to return to the exact site of its fledging. But to read such a fact and to hold in your hand a minute, brilliant, pulsating hooded warbler wearing the tiny band you had affixed the previous summer are two very different learnings. There are endless miracles to be observed in our natural world, but this winged mite's ability to be in my net again after a winter's sojourn to Central America excites my highest admiration. I admit that the wonder of it moved me to tears, so deeply was I touched by the miracle of return of this five-inch long creature whose brain must be less than pea size. Bird brain, indeed!"*

So, on a clear, calm night in spring or fall, venture out into the darkness. Find a clearing and direct your senses skyward. Think of Larry Walkinshaw's Willow Flycatcher or Emma Pitcher's Hooded Warbler or perhaps a personal favorite of your own. As your eyes adjust to the celestial display overhead, listen for the call notes of small birds navigating the heavens. Close your eyes. Deeply breathe the cool night air. Then finally, to the extent humanly possible, try to imagine migration . . .

# Summer Indiana Field Notes 2018

**Ken Brock, Chesterton, IN**

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Summer of 2018 was warm and dry (see Table).

The season's highlights included: first breeding record for Black-bellied Whistling Duck, a visiting Roseate Spoonbill, a lingering Black Rail, breeding Sandhill Cranes expanded southward into Greene County, and three Snowy Owls.

Temperature & Precipitation at Indianapolis: Departure from Normal		
	Temp (°F)	Rainfall (in.)
Jun	+3.5	-0.26
Jul	+1.6	-1.55

Breeding season highlights included:

Black-bellied Whistling-Duck:- Justin Garrett found (3) near the Patoka River (Pike Co) on 14 June, providing a first county record. A single male was reported at the Country Mark Refinery Club in Posey County on 26 July. Then on the 28<sup>th</sup> a family group of two adults and 14 downy chicks was observed and photographed (Logan Harlan and many observers). This provides Indiana's first breeding record.

Great Blue Heron:- The (230) that Evan Speck tallied at Oatsville Bottoms (Gibson Co) on 18 July constitutes Indiana's fourth largest summer count.

Roseate Spoonbill:- On 1 June Ruth Ann Daniel and Ed Stokem found (1) at Stillwater Refuge on Monroe Res. They pointed out the bird to Jeff Danielson who brought the bird's presence to the birding community's attention. This second modern record lingered in the area until at least 10 June (Ryan Sanderson).

Black Vulture:- The (142) that Sean Verkamp carefully counted at the Patoka Dam tailwaters provided Indiana's largest summer Count (STYM=151).

Yellow-crowned Night-Heron:- A northern tier adult was photographed at Potato Creek S.P. on 24 July (Bob Huguenard).

Black Rail:- On 2 July an Amish farmer heard a calling bird new Howe (LaGrange Co). The bird continued calling the following day and was confirmed by several observers, including Brad Bumgardner who briefly saw the bird at 10:31 PM on the 3<sup>rd</sup>. The rail continued to call until at least 9 July



**Black Rail photographed by Sam Plew in LaGrange Co. on 07 July, 2018.**

(Karen E. Brown).

Sandhill Crane:- On 18 June Jim Brown and Lee W. Sterrenburg discovered a pair with a half-grown colt in Field B. This provides the first successful breeding record for Goose Pond FWA and Indiana’s southernmost breeding report.

**SHOREBIRDS**

Piping Plover:- Seven, mostly banded adults, were reported on the lakefront this summer (STYM=2.5).

American Avocet:- The summer’s only report was (1) that John K. Cassady found standing atop the Michigan City Harbor breakwall on 14 July (STYM=18.1).

Upland Sandpiper:- This summer 14 were reported across the state (STYM=19.2). The peak tally was (5) at Grissom Air Base on 23 June (Adam Wilson).

Marbled Godwit:- See table (season total= 11; TYM=7.1).

Summer 2018 Marbled Godwit Records			
No	Date	Location	Observer
5	5-Jul	Michigan City Harb	John Kendall et al.
1	9-Jul	Michigan City Harb	Edward Hopkins
5	12-Jul	Michigan City Harb	Nicole Koeltzow

Willet:- For the season 151 were reported (STYM=109). The peak count was (87) that John C. Kendall, Brad Bumgardner, and Ken Brock tallied at Michigan City Harbor on 5 July.

Whimbrel:- John K. Cassady found (1) in a cultivated field at the old Shamrock Sod Farm in LaPorte Co on 9 June (intersection of SR 39 and US 30). Photos were obtained. John’s find provided Indiana’s second inland record for June. John also found this summer’s second record at Michigan City Harbor on 28 July (STYM=4.9).

Sanderling:- A banded bird at Michigan City Harbor on 22 July (Evert and Lisa Vanderbilt) was banded in 2017 at Delaware Bay, New Jersey (*fide* John C. Kendall).



**Thadeus Shaum photographed this well marked Piping Plover at Miller Beach (Lake) on 26 July 2018.**



**Whimbrel found by John Cassady in LaPorte Co, 9 June, 2018.**

Baird's-Sandpiper:- An early migrant was seen in a Michigan City Harbor Sanderling flock on 14 July. It provided Indiana's fourth earliest fall record (John K. Cassady et al.). Due to the great distance the bird was not aged. However, very likely this same bird lingered until 16 July (John C. Kendall & Brad Bumgardner) and was confirmed to be an adult.

Least Sandpiper:- The season's first fall migrant was at the Wheeling Bottoms (Gibson Co) on 24 June (Heath Harlan and Logan Harlan).

White-rumped Sandpiper:- The (3) birds that Evan Speck found at Patoka River NWR Oatsville Bottoms (Gibson Co.) on 23 June were most interesting. Based on past records they are likely the latest spring migrants ever recorded in the state, as they were four days after the previous latest date of 19 June. The earliest fall migrant is 7 July.

Wilson's Snipe:- The season's only report was a singleton that Martin Stoner found on Pokagon Tribal Land (St. Joseph Co) on 25 July (STYM=7.9). This is Indiana's lowest summer count since 2005.

Black-billed Cuckoo:- Singletons were found in Chesterton on 3 June (M. Penny Starin) and at BEV on 5 June (Ella Pennington). The summer TYM=0.65.

Snowy Owl:- Following last winter's record flight, three Snowys were logged this summer (see Table). The Goshen Airport bird was reported again on 22 July (Bob Guth et al.).

Summer 2018 Snowy Owl Records			
No	Date	Location	Observer
1	10-Jun	Rural Howard Co	Kathryn Farnsworth
1	26-Jun	Benton Co	Local farmer
1	7-Jul	Goshen Airport	Carla Gull

Yellow-bellied Sapsucker:- Indiana's third July record was logged 17 July when Conrad Harstine found one in Matter Park, Grant Co.

Alder Flycatcher:- Paul Sherwood observed a singing bird in Shrader-Weaver Woods on 20 June, providing Fayette County's first record.

Loggerhead Shrike:- Brendan J. Grube spotted (1) perched on roadside wires at Reynolds Creek G.H.A. on 3 July. This is the lakefront's second record for 2018. Prior to this year the lakefront's last record occurred in 2002.



**Summer Red-breasted Nuthatch at Bruce Glick residence (Elkhart) 22 June 2018.**

Red-breasted Nuthatch:- On 22 June an undetermined

number of fledglings were observed begging for food at Bruce Glick's residence in Goshen.

## WARBLERS

"Brewster's" Warbler:- Julie Gidwitz photographed (1) in northern LaPorte Co on 6 June.

Tennessee Warbler:- Indiana's third earliest fall migrant was photographed in northern LaPorte Co on 28 July (Julie Gidwitz).

Northern Parula:- Most interesting was a singing bird heard 29 June along an inaccessible (except by boat) section of the Little Calumet River near Brummett School (Lynea S. Hinchman). There are no breeding records of this warbler in the Dunes area.

Scarlet Tanager:- On 3 June M. Penny Starin observed a singing male in Porter Co: it proved to be the orange variant.

Dickcissel:- Summer Dickcissel numbers continue to surge. This year an all-time high tally of 2376 was reported in the state (STYM=1122).

*Conventions: Summer totals are frequently compared to average seasonal counts in the "Dunes area" (Calumet Region or lakefront) over the past 20 years, including the present year. This value is abbreviated "TYM" for Twenty Year Mean. The term "STYM" refers to the twenty-year mean for the entire state.*



**Brewster's Warbler in LaPorte Co., 28 July by Julie Gidwitz.**

# Indiana Bird Records Committee 2017 Annual Report

**Kirk Roth, Indianapolis, IN**

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In 2017, Four species were added to the Indiana Checklist, which stands at 424 species. These were: **Golden-crowned Sparrow, Wandering Tattler, Mottled Duck, and Ivory-billed Woodpecker**. The Ivory-billed Woodpecker was added based on historical documentations compiled by Benjamin Leese. The Leese document will be kept in the IBRC archives.

An updated Indiana Checklist was produced this year which included these additions but also brought the Checklist up to date with the recent taxonomic changes enacted by the American Ornithological Society (AOS) based on several studies of bird genetics and relationships. The changes to species order are substantial and may be surprising to many Indiana birders who are used to the “old sequence.” It is notable that the AOS species list is already incorporated into the newest National Geographic Field Guide (7th edition) but not yet into eBird. The updated Indiana Checklist was incorporated into the Indiana Audubon Society website in late January.



**2017 first state record Golden-crowned Sparrow. Photo by Matt Beatty in Indianapolis (Marion) on 17 April 2017.**

The IBRC approved some revisions for the state review list

- Thayer’s Gull would be removed from the list, due to the recent American Ornithological Society taxonomic decision
- Many other gulls are review birds under the “away from Lake Michigan” category, but that may be ill defined or inappropriate in the cases of Iceland, Glaucous, and Great Black-backed Gulls which have been found at the St. Joseph River and garbage dumps in counties nearby Lake Michigan. It was decided to change the designation for these birds to “Away from a 50-mile radius from Lake Michigan” which would encompass these clusters of reports.

- It was discussed that the review status of other Lake Michigan species could be changed from “away from Lake Michigan” to “immediately away from Lake Michigan.”
- Fish Crow was designated as reviewable “away from known locations” but this was a non-definitive category. It was decided that the Fish Crow should be a review species “Away from southwest Indiana and Marion County.”
- The review designation for Least Tern was changed to “Away from Gibson, Greene, and Spencer Counties” where breeding colonies exist.
- The review designation for Monk Parakeet was changed to “Away from Lake County” where breeding is known to occur.

The committee acted on the following records in 2017. Dates refer to 2017 unless otherwise indicated. APE = Accepted with Physical Evidence; ANPES = Accepted with No Physical Evidence, Single Observer; ANPEM = Accepted with No Physical Evidence, Multiple Observers; NI = Not Accepted, Insufficient Evidence

<b>SPECIES</b>	<b>RECORD CODE</b>	<b>RULING</b>	<b>NOTES</b>
Long-tailed Jaeger	LTJA-033-LAKE	ANPEM	
Prairie Falcon	PRFA-015-GIBS	ANPEM	
Glaucous Gull	GLGU-008-STJO	ANPES	
Western Kingbird	WEKI-027-VERM	APE	
Little Gull	LIGU-009-UNIO	APE	
White Ibis	WHIB-017-VAND	APE	
White Ibis	WHIB-018-VIGO	ANPES	
Townsend’s Solitaire	TOSO-012-LAWR	APE	
Townsend’s Solitaire	TOSO-013-MADI	APE	
Cinnamon Teal	CITE-014-LAPO	APE, NI	1 bird accepted, 1 bird possible hybrid
Cinnamon Teal	CITE-015-GREE	APE	
Black-bellied Whistling-Duck	BBWD-016-GREE	APE	
Black-bellied Whistling-Duck	BBWD-017-BOON	APE	
Black-bellied Whistling-Duck	BBWD-018-VIGO	APE	
Yellow Rail	YEAR-015-WABA	ANPES	
Red Knot	REKN-007-GIBS	APE	
Ruff	RUFF-018-GREE	APE	

Ruff	RUFF-019-WARR	ANPEM	
Ruff	RUFF-020-GIBS	APE	
Swainson's Hawk	SWHA-019-PORT	APE	
Common Raven	CORA-001-STAR	NI	
Golden-crowned Sparrow	GCSP-001-MARI	APE	
Mottled Duck	MODU-001-GREE	NI	Concerns about hybridization
Mottled Duck	MODU-001-GIBS	APE	
Ivory-billed Woodpecker	IBWO-001	Add to List	Accept historical evidence of occurrence in Indiana
Long-tailed Jaeger	LTJA-032-LAKE	APE	
Wandering Tattler	WATA-001-LAPO	APE	
Magnificent Frigatebird	MAFR-005-LAKE	NI	Accepted as "frigatebird sp."
Royal Tern	ROYT-003-LAKE	NI	



**2017 first state record Mottled Duck at Cane Ridge (Gibson). Photo by Amy Kearns on 31 May 2017.**

# Excerpt from the 2017 DNR Wildlife Sciences Annual Report

## Indiana DNR Fish & Wildlife

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*Editor's Note: The following excerpts detail the Indiana Division of Fish & Wildlife nongame program efforts related to birds in 2017. For the full annual report, visit <https://www.in.gov/dnr/fishwild/3347.htm>.*

## INTRODUCTION

The mission of the DFW is to professionally manage Indiana's fish and wildlife for present and future generations, balancing ecological, recreational, and economic benefits. At its simplest, the role of the Wildlife Science Unit in this mission is to provide fundamental and fact-based information to guide resource management decisions. This is challenging, vitally important work that drives the informed stewardship of Indiana's wildlife resources. In 2017, Wildlife Science added a much-needed wildlife health component to lead the DFW in tackling the myriad of known and emerging diseases that can affect Indiana wildlife. Our annual report offers a brief glimpse into Wildlife Sciences' major programs. We hope you find it both informative and inspiring, and that you discover something new about Indiana's wildlife resources and the efforts in place to ensure they persist for Hoosiers now and in the future.

## NONGAME BIRDS

### Bald Eagle Population Soaring

Each year, biologists' catalog new bald eagle (*Haliaeetus leucocephalus*) nest sites throughout Indiana. Reports from property managers, conservation officers and the public bring to our attention newly discovered nests and recent information about known nests.

The number of bald eagle nests has grown considerably over the past several years. The last statewide bald eagle breeding survey, which was conducted by helicopter in 2010, documented 120 eagle pairs. Since then, 274 new nests have been discovered.

Because of extreme weather or abandonment, nests may fall out of trees or become unkempt over time. Those that remain intact likely host a pair of bald eagles. In 2017, 231 nests were reported, 208 of which appeared in good shape. These nests produced at least 149 chicks. Sixty-

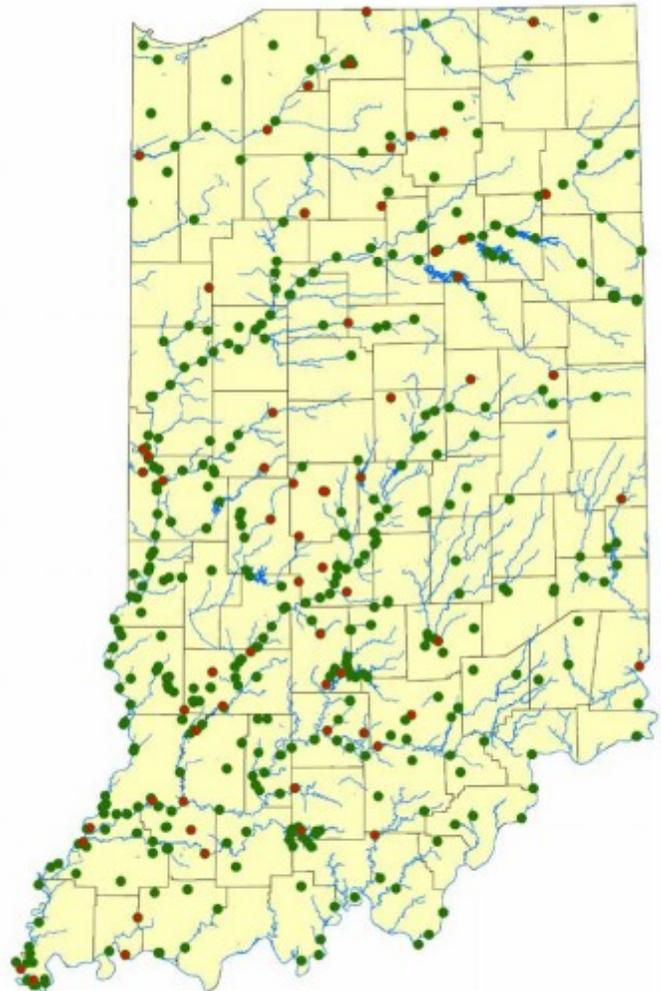


*C43 was one of the first bald eagles reintroduced to Indiana and perhaps one of the state's oldest. In 2017, she was spotted near Monroe Lake for the third consecutive year. (Photo by Stuart Forsythe)*

two nests were new, one of which was the first known eagle nest in Boone County. Bald eagles are now known to nest in 84 of Indiana's 92 counties. The current population is estimated at 300 breeding pairs.

In addition to nest monitoring, wintering eagles are surveyed to monitor long-term population trends in the region and to inform the status of bald eagles throughout North America. These surveys are part of the U.S. Army Corps of Engineers' National Midwinter Bald Eagle Survey, which has been conducted in Indiana since 1979. In 2017, eagles were counted from the ground at 10 locations, mainly DFW properties or public lakes. Aerial monitoring was also done by helicopter at 10 routes along rivers that are less accessible by foot. Overall, 274 individuals were tallied at these sites, which exceeds the 10-year average of 197 eagles for the state. This is fewer than those counted during the same period in 2016 (388), but eight fewer sites were surveyed from the air.

Ground surveys represent population trends more precisely because of consistent sampling from year to year. At nine sites surveyed from the ground in the past two years, 190 bald eagles were counted compared to 168 in 2016, a 13% increase. The largest concentrations were found at a roost near Sugar Creek's West Union Bridge (100 eagles), the Mississinewa night roost (34), Salamonie River roost (29), and Monroe Lake (28).



*Previously known bald eagle nests (green) and new nests discovered in 2017 (red) in Indiana.*

Winter eagle counts vary depending on the severity of winter, availability of prey (fish and waterfowl) and open water. Indiana attracts more eagles during cold winters when northern birds are forced to venture south for food. However, long-term data suggest a consistent upward trend of bald eagles wintering in Indiana. A recent article in the Journal of Raptor Research reported a significant yearly increase of 3.6% in Indiana's wintering adult eagle population and 3.9% in the immature population from 1986–2010. Our current data support this 25-year trend.

We are seeing more bald eagles winter in Indiana each year. Nationally, the population is increasing by 0.6% each year.

The growth in the bald eagle population is a major conservation accomplishment. After World War II, the effects of DDT and other pesticides caused dramatic declines in many raptor species, and bald eagles were no exception. Banning of DDT in 1972 later contributed to nationwide recovery. Statewide recovery was enhanced by restoration efforts from 1985–1989, when 73 eaglets from Wisconsin and Alaska were raised and released at Monroe Lake to restore a breeding population in Indiana. By 2007, our national symbol was declared recovered and removed from the federal endangered species list. Indiana followed suit in 2008 after reaching a goal of 50 nesting pairs. This was a significant achievement—no eagles were known to have nested in the state from about 1900–1988.

Remarkably, C43, a female that was one of the original released eaglets, has been spotted around Monroe Lake. She was first reported in 2015 after 20 years of going undetected and has since been photographed annually. This year, she was found by Stuart Forsythe in the Middle Fork area of Monroe Lake. C43 can be identified by the silver bands around both legs and the wear on her left wing where her patagial tag was once attached. By now, she should be around 29 years old, which arguably makes her the oldest bald eagle in Indiana. C43 is a powerful reminder of the tireless and determined effort to recover this species, and a symbol of hope for all of our state's endangered species.

### **Peregrine Falcon**

Peregrine falcons (*Falco peregrinus*) declined sharply in the mid-1900s because use of pesticides, such as DDT, reduced nesting success. They were listed as an endangered species by the USFWS in 1970. Today, because of reintroductions, more than 300 breeding pairs occur in the Midwest. This figure is several times that of the 60–80 pairs thought to have been present historically. Indiana's population has expanded similarly. In 2013, peregrine falcons were removed from the state's list of endangered species. They are now considered a species of special concern.

Breeding by peregrine falcons in Indiana has remained relatively stable during the last five years. Twenty-one locations had peregrines present during part of the 2017 nesting season, compared to 22 in 2016. Sixteen nesting attempts were documented, 13 of which were successful. Forty chicks were banded, and 42 young fledged. Three nests failed, with eggs that did not hatch or were broken. Biologists took blood samples to monitor the birds' health and collected unhatched eggs for analyses. No signs of trichomoniasis (or "frounce"), an upper digestive tract disease that is often fatal in young birds, was found.

Much is known about individual falcons because many young are banded each year. The 10 identified adults in territories where eggs were laid in 2017 originated from seven states: Indiana (three falcons), Kentucky and Michigan (two each), and one each from Ohio, Missouri and Wisconsin. The remaining 20 adults were either unbanded or not observed well enough to identify.

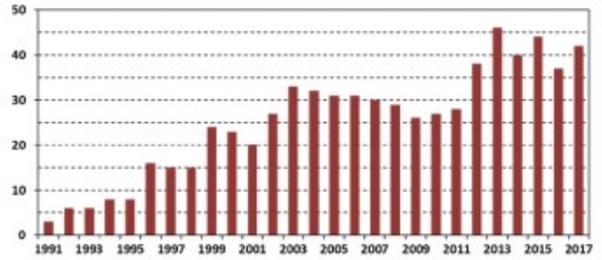
All 16 peregrine nest attempts in Indiana in 2017 were located in highly developed and populated areas. Four were in downtown urban areas on office buildings; the remainder were in industrial areas on power plants, steel mills and lime plants. Indiana’s breeding population of peregrine falcons has remained productive during the last five years. Post-delisting monitoring will continue, with volunteer help, to ensure the population remains stable.

Since 2014, falconers have been permitted to trap an unbanded juvenile peregrine in the fall for falconry. These birds are juvenile migrants that originate from breeding populations in Arctic regions. One bird was captured in Indiana in 2014, but none have been since although permits were issued annually. Only two birds were allowed to be taken in Indiana in 2017, and only 12 falcons could be captured in the entire Mississippi Flyway.

**Osprey**

Ospreys (*Pandion haliaetus*) are large, eagle-like birds that were commonly found in Indiana during migration, hovering, diving and catching fish in lakes and rivers. Historically, few would remain to nest, building large stick nests in dead trees near shorelines or on islands.

To restore osprey to Indiana, 96 young birds taken from nests in coastal Virginia were released at Patoka Lake and Jasper-Pulaski, Minnehaha, and Tri-County Fish & Wildlife Areas (FWA) between 2003 and 2006. Indiana’s osprey population has since shown steady growth, and exceeded its delisting goal of 50 breeding pairs in 2014. Today, osprey are proposed for removal from the Indiana list of endangered species.



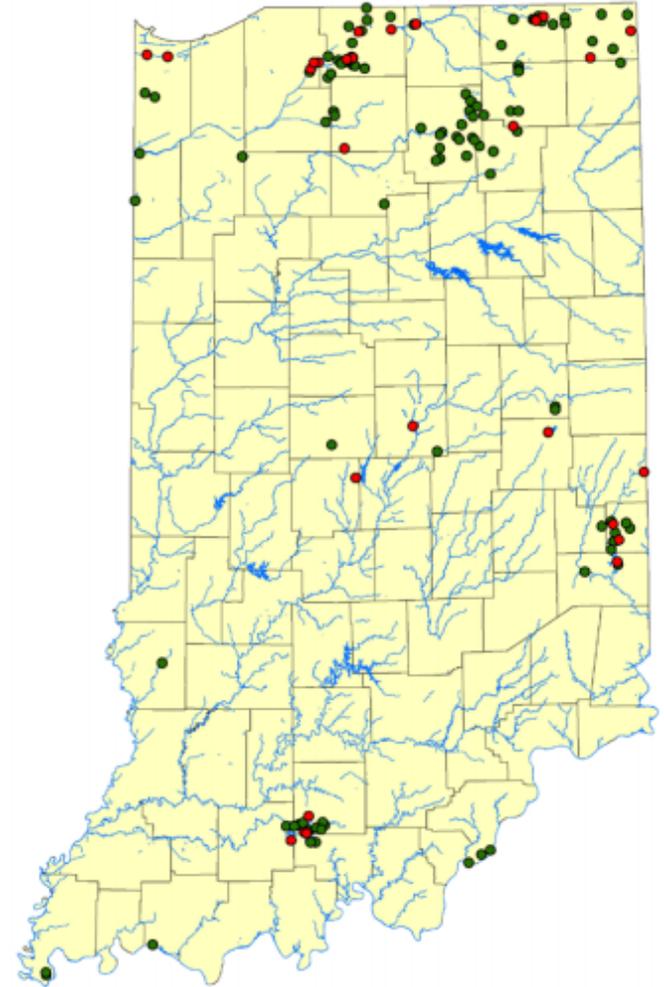
*Annual number of peregrine falcon chicks fledged in Indiana since the DFW reintroduction program began in 1991.*



*An adult peregrine falcon delivers a banded pigeon to its young at a nest box at the NIPSCO R.M. Schabfer Generating Station in Wheatfield. This photo was taken by a trail camera used to determine the birds’ identities. Both adults were unbanded.*

Osprey nests are monitored through reports from Indiana DNR staff and the public. In 2017, only 36 nesting sites were checked compared to 78 in the previous year. Of these, 29 had ospreys or osprey nests present (64 in 2016), with 20 pairs believed to have laid eggs. At least 29 chicks were produced (32 in 2016). The actual number is likely greater because it is difficult to observe all young in the nest from the ground.

Active osprey nests are known from 18 Indiana counties, including new records for Hendricks and Henry counties in 2017. Loosely formed colonies are found in St. Joseph (five nesting pairs) and Orange, LaPorte, and Lake (three each) counties. Public properties with the largest concentrations of nests are Patoka Lake, Pigeon River FWA, Potato Creek State Park, and Brookville Lake. In 2017, osprey nests were located on 15 communication or utility towers, nine nesting platforms, stadium lights and dead trees (two each), and a structure associated with grain storage. Companies that service communication and utility towers often contact the DFW for guidance when encountering osprey nests, and most delay maintenance until after the nesting season. Vacant nests can be removed from towers without a permit, but companies are encouraged to keep part of the nest at a location on the tower where it is less likely to interfere with its operation.



***Distribution of osprey nests from 2012 to 2016 (green), and those reported as active in 2017 (red).***

Nesting platforms, including all five at Patoka Lake, are readily used by ospreys. In 2017, a banded osprey with a juvenile was photographed on a Patoka Lake tower. The banded individual was H18, one of 16 original ospreys released at Patoka Lake. H18 is now 14 years old and is breeding successfully, as evidenced by the attending juvenile on the nesting platform.

This bird and its offspring remind us of the success of our reintroduction programs and provide a positive outlook for ospreys in Indiana. As long as unpolluted waterways, healthy fish populations, and suitable nest sites exist, our osprey population will continue to thrive. However, knowing whether the population is recovering depends on public reports of osprey

nesting activity. The number of reports at the end of the 2017 nesting season was 54% lower than in 2016. What may appear to be a large decline in the number of osprey nests likely reflects a lower reporting rate. DFW staff encourage the public to report osprey nest locations and provide updates on breeding activity, such as nest building, incubation, food deliveries and begging chicks. These reports can be sent to: [agillet@dnr.IN.gov](mailto:agillet@dnr.IN.gov).

## **Barn Owl Management**

Barn owls (*Tyto alba*) are a state-endangered species in Indiana identified by their ghostly pale appearance, black eyes and heart-shaped face. They are nocturnal, feeding mostly at night often on small mammals like mice and voles. One adult barn owl eats, on average, three to four small mammals a day. A nesting pair and several owlets will consume nearly 3,000 prey items during a year, making them an effective form of pest control around farms that is both economical and non-toxic.

Habitat loss has caused barn owls to become rare in Indiana. Their numbers depend on the availability of grassland habitat, suitable nest sites, and protective cover from predators such as great horned owls (*Bubo virginianus*) and raccoons (*Procyon lotor*). Barn owls need open areas of permanent grasslands such as pastures, hayfields, prairies and the margins of wetlands to find food. They also need cavities in large trees or structures such as haylofts, steeples, and silos in which to nest and raise their young. Many of these conditions exist in small pockets of southern Indiana, including Daviess, Gibson, Greene, Lawrence, Orange, and Warrick counties.



*Nest boxes provide a safe place for barn owl chicks because they reduce their risk of predation and their chances of falling out of the nest.*

To aid barn owl populations in Indiana, the DFW has installed more than 300 nest boxes during the past 30 years to provide secure nesting sites that are protected from severe weather and predators. DFW staff and volunteers install boxes in barns and other structures surrounding suitable habitat across the state. Thirty-seven new boxes were installed in 2017, and 15 nest sites were reported active.

Many of these structures have been destroyed over the years, but new boxes are erected each year, and existing boxes are inspected periodically. A comprehensive check of 243 priority nest boxes began in fall 2017 and will continue into early 2018 to determine if boxes were occupied since their last check. The presence of pellets (regurgitated fur and bones) and white wash (owl

droppings) is evidence that barn owls used the box. Unhatched eggs and the carcasses of owlets suggest that barn owls nested in the box. Nest boxes will continue to be placed by DFW staff and volunteers in barns and other buildings to help barn owls raise additional young. If you observe a barn owl, especially a nesting pair, contact Wildlife Science staff.

### **Loggerhead Shrike**

The loggerhead shrike (*Lanius ludovicianus*) is a predatory songbird that is slightly smaller than a robin. Its striking appearance includes a broad black eye mask, gray back and breast, and a white spot on black wings. Despite their small stature, shrikes have habits similar to those of a large raptor. They hunt from perches and pounce on prey they spy below. Their strong, hooked bill and tomial tooth (the pointed projection on the upper part of the bill) allow them to sever the vertebrae of comparatively larger prey. But because shrikes lack talons to tear prey into smaller pieces, they hang their prey from thorns or barbed wire, allowing them to pull their meal apart with just their bill. This behavior has earned them the nickname of “butcher bird,” a moniker that is unique to North American shrikes.



*Biologists determined that this individual shrike spent the 2016–17 winter in his Daviess County nesting territory by observing its unique combination of colored leg bands. (Photo by Michael Brown)*

Shrikes occur year-round in grassland and agricultural areas of Indiana. During the breeding season, nesting shrikes are often found near livestock, gardens and small crop fields bordered by shrubby fencerows. Multiflora rose bushes and eastern red cedars that occur in isolated patches along fencerows are ideal nest sites.

Loggerhead shrikes have been undergoing alarming population declines in eastern North America and are an endangered species in many states. Reasons for the declines are puzzling and may include factors such as loss of quality breeding habitat, pesticide use, and increasing human development on wintering grounds. In Indiana, shrike numbers have declined dramatically. A survey between 1999 and 2000 recorded 58 nesting territories statewide, but annual breeding surveys now document fewer than 10 nesting territories.

In 2017, DFW biologists and volunteers located seven territories with breeding pairs in historical nesting areas, compared to five in 2016. Five territories were in Orange County, with one each in Daviess and Greene counties. These seven pairs had an average nest success of 50%, compared to those in 2016 who had a success rate of 37.5%. Four nests failed likely due to predation and one from unknown causes. Six nesting attempts occurred between March and

May. Four of those (67%) were successful. The four remaining attempts occurred between May and June. Only one was successful. Six of seven territories (86%) were in areas where shrikes were recently seen. Two (29%) had successfully nested last year. Nearly 80% of all nesting attempts were located on Amish or Mennonite farms. In total, 19 shrike fledglings were confirmed in 2017, compared to 10 confirmed during 2016.

Four adults and one fledgling of 12 shrikes banded in 2016 were re-sighted, producing return rates of 33% and 44% for, respectively, fledglings and adults. Additionally, 22% of the adults banded in 2016 returned to nest in the same territory. However, 12 of 15 (80%) nesting adults likely had new nesting territories in 2017.

Twenty-three new shrikes were captured and banded in 2017, compared to 11 in the previous year. Among these, 11 were adults, nine were aged as After-Second Year (ASY), and two were aged as Second-Year (SY). Ten of these adults nested this year. All banded males that nested were ASY, whereas 60% of banded nesting females were ASY. The remaining 40% of banded nesting females were aged as SY. One nesting male and two nesting females were not banded because their territories were found late in the season when birds were more difficult to capture. Prey items that shrikes consumed, delivered to their young, or hung on thorns or barbed wire were periodically counted to determine shrike diets. Arthropods such as beetles, grasshoppers, wasps, and spiders represented 88% of the 107 shrike food items observed in 2017.

Other prey items included mice, voles, house sparrows, snakes and frogs. Indiana's loggerhead shrike work contributes significantly to a coordinated effort with that of other states through the Loggerhead Shrike Working Group. This group seeks to fill knowledge gaps that hinder shrike conservation through coordinated and collaborative research and monitoring aimed at stabilizing and reversing population declines.

Landowners can help shrikes and other wildlife by preserving fencerows and the shrubs that grow along them. Because shrikes usually nest in isolated bushes and trees along fencerows, eliminating these linear features effectively destroys nesting habitat for this unique bird. If fencerows must be cleared, landowners may consider waiting until after the nesting season (late April to late August) to give young birds a better chance to survive. Fencerows provide nesting habitat for many native birds and food and cover for other wildlife, including deer, rabbits, and bobwhite quail. Farms with healthy, shrubby fencerows have a greater diversity of native wildlife than those without, and many of these species are beneficial for insect and pest control.

### **Interior Least Tern**

The least tern (*Sternula antillarum*) is the smallest tern in North America. It is distinguished by its black cap, white forehead, and bright yellow bill. Existing populations are found along the coasts and in the interior, following major waterways such as the Mississippi, Ohio and Wabash

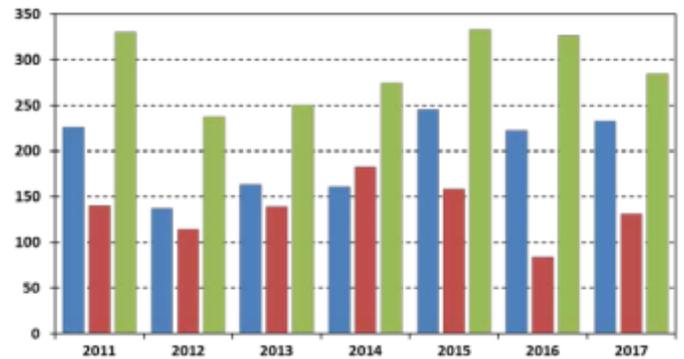
ivers. High water levels due to channelization and damming of rivers have reduced the amount of sandbars or gravel islands available for terns to nest. As a result, the interior least tern population was listed as federally endangered in 1985.

Least terns make a depression, known as a scrape, in the ground near water and lay their eggs directly in the scrape. Ground-nesting near water affords least terns many benefits, but also poses many risks. Water surrounding islands or river bars makes colonies less accessible to ground predators. However, when water is abundant, rivers rise. This causes bars and islands to shrink, thereby reducing nesting habitat. Heavy rains also flood nests and cause abandonment or major losses of eggs and chicks.

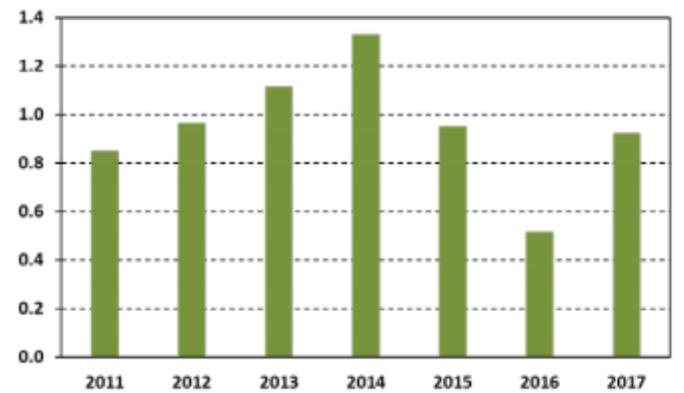
Because of high water in key river areas, least terns now nest in Indiana at five human-constructed sites: Duke Energy’s Gibson Lake and USFWS’s Cane Ridge Wildlife Management Area (WMA) near the lower Wabash River, the American Electric Power (AEP) Rockport Plant on the Ohio River, Goose Pond FWA, and Wheeling Bottoms. DFW staff work closely with partners to monitor tern colonies and take measures to ensure breeding success at these sites.

In Gibson County, an estimated 168 nests produced a conservative estimate of 123 fledglings in 2017. Of these, 103 were found early in the breeding season, while another 65 were tallied later. More than half of all nests and young produced in 2017 were at Cane Ridge WMA (86 nests). The remainder were on the center dike of Gibson Lake (82 nests).

At the AEP Rockport Plant, an electric fence was erected around the main nesting site to reduce predation by mammals and prevent Canada geese (*Branta canadensis*) from loafing on the dike. At least five young were produced from 59 nests. Ten adult terns returned to Goose Pond FWA, where six nests were attempted on a man-made island. These nests together successfully fledged at least three young. No nesting was documented at Wheeling Bottoms in 2017. The number of tern fledglings produced in 2017 was average compared to previous years. Productivity was 0.923 fledglings per pair, which is greater than the productivity of 0.515



**Annual number of least tern nests (blue), fledglings (maroon), and adults (green) observed in Indiana, 2011–2017.**



**Number of least tern fledglings per adult pair in Indiana, 2011–2017.**

fledglings per pair in 2016. Both figures exceed the published rate of 0.51 fledglings per pair needed to maintain a viable least tern population.

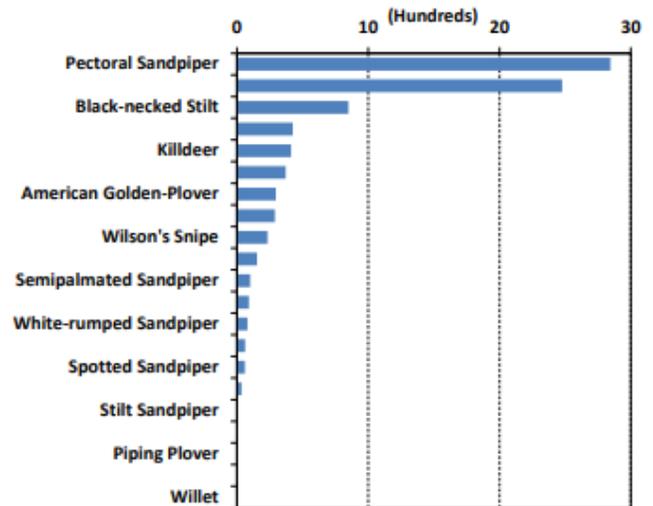
Management of interior least terns is challenging. Nesting sites must be kept free of dense vegetation and fencing or water level manipulation is often needed to deter ground predators. Least tern decoys may be helpful in attracting adults to suitable nest sites. These efforts have resulted in more than adequate production in four of the last five years and a steadily increasing population of least terns in Indiana since their discovery in the state in 1986.

### Shorebird Migration

Goose Pond FWA is one of the largest wetland restoration projects in the country. Located near the migratory pathways of the Wabash River and East Fork of the White River, this 9,000-acre property boasts a variety of habitats from upland grasslands to shallow wetlands. In 2015, DFW biologists began conducting surveys of its use by spring and fall migrating shorebirds to evaluate the property’s importance as a stopover site.

Compared to other North American birds, shorebirds undertake some of the most remarkable seasonal migrations. Species like the white-rumped sandpiper (*Calidris fuscicollis*) are among the long-distance migrants that may venture between wintering grounds at the southern tip of South America and their nesting territories in the Canadian Arctic. Shorebirds must build adequate fuel reserves during stopovers to survive these journeys. Having quality foraging habitat at migratory stopover sites is essential.

Thirty-six different shorebird species have been recorded at Goose Pond FWA during spring and fall migration, including the federally endangered piping plover (*Charadrius melodus*). Additionally, eight birds listed as a SGCN in Indiana are regular visitors or breeders. In 2015, surveyors counted 13,192 shorebirds representing 30 species, whereas surveys in 2016 recorded 12,146 shorebirds of 25 different species. Surveyors recorded 8,805 shorebirds of 21 different species during the 2017 spring survey. Data from fall surveys will be available early in 2018.



Number of 11 species of shorebirds detected during spring surveys at Goose Pond FWA in 2017.

Notable spring records include a piping plover in Main Pool West on April 17. Its unique leg bands identified it as an individual that hatched in 2015 on North Manitou Island on Sleeping Bear Dunes National Lakeshore in Michigan. Surveyors also documented Goose Pond’s first

record of a ruff (*C. pugnax*) in midApril in Main Pool West and East. Ruffs are a Eurasian shorebird and a rare vagrant to Indiana.

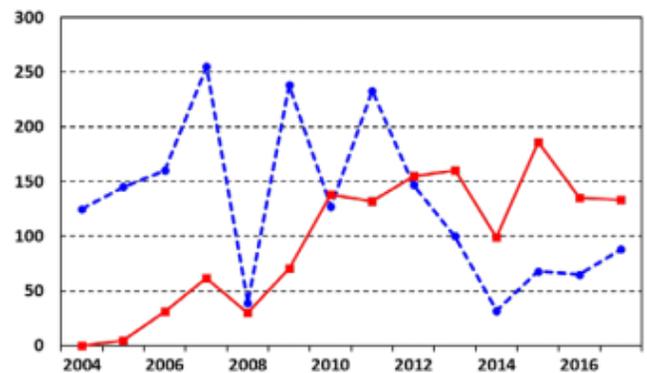
A count of 80 white-rumped sandpipers on June 1 was a new spring migration and summer season record for this species. The previous spring migration highest count was 50 birds in Delaware County in 1978. On April 25, 60 long-billed dowitchers (*Limnodromus scolopaceus*) were recorded, also a new spring record for the state. This high was surpassed on May 2, when 183 individuals were tallied at Goose Pond.

Pectoral sandpipers (*C. melanotos*; 2,845 individuals) were the most abundant species, representing 32% of the total shorebirds. Other plentiful species included the lesser yellowlegs (*Tringa flavipes*; 2,477; 28%), black-necked stilt (*Himantopus mexicanus*; 849; 10%), greater yellowlegs (*T. melanoleuca*; 425; 5%), and killdeer (*C. vociferous*; 413; 5%). These five species accounted for nearly 80% of all shorebirds with 16 other species representing the remaining 20% of the total spring count.

Such findings demonstrate the importance of Goose Pond FWA as a critical stopover site for migratory shorebirds. Surveys will continue in 2018 to further investigate shorebird use of this nationally recognized wetland complex.

### Colonial Waterbirds

“Colonial waterbird” refers to any species of aquatic bird that nests close to one another, including herons, egrets, cormorants, terns and gulls. In Indiana, colonies of black-crowned night-herons (*Nycticorax nycticorax*), great egrets (*Ardea alba*), and double-crested cormorants (*Phalacrocorax auritus*) on Lake Michigan’s shoreline are surveyed each year. Both heron and egret species are state-listed and monitored to detect changes in abundance. Although not endangered, double-crested cormorants are of concern in the Midwest because their growing populations pose a potential threat to local fisheries. Cormorants also compete for nest sites with less common heron and egret species.



Number of black-crowned night heron (dotted blue line) and great egret (solid red line) nests at the ArcelorMittal Steel plant in Lake County, 2004–2017.

At ArcelorMittal Steel West, black-crowned night-herons had a thriving colony in the 1990s until beavers (*Castor canadensis*) destroyed most of the trees they use for nesting. Regrowth has occurred and night-herons and great egrets now nest at this site along the Indiana Harbor at Lake Michigan. Nesting by great egrets was first observed here in 2009. Counts of colonial

waterbirds were conducted on May 23, 2017. Eight black-crowned night-heron nests were found, a decrease from the 15 nests seen in 2016. The number of great egret nests also declined (45 in 2017 compared to 73 in 2016). Nesting cormorants have yet to be observed at ArcelorMittal Steel West.

At ArcelorMittal Steel East, 3,250 double-crested cormorant nests were counted. This is a 45% increase from the number found in 2016 (2,240 nests), but consistent with results since 2010. The number of great egret nests also increased, with 88 recorded compared to 62 in 2016. Eighty black-crowned night-heron nests were tallied, which represents a 60% increase from 2016 (50 nests). Abundance, however, still remains low. The maximum count of night-heron nests since surveys began in 2004 is 255.

These three species of waterbirds tend to segregate themselves in the main nesting colony. Double-crested cormorants nest on the ground, close to Lake Michigan's shoreline. Great egrets use the few remaining trees farther from shore. Black-crowned night-herons nest in shrubs or in the lower portions of trees used by egrets, but also nest next to gulls on the rocky perimeter of two small impoundments. All great egret and night-heron nests were in trees or shrubs, compared to only 39 cormorant nests (1% of total). At ArcelorMittal, ground-nesting birds are protected from many mammalian predators by the water of Lake Michigan and the extensive industry on the remaining sides.

Gull and tern populations were also estimated at this site. Some 35,000 ring-billed gulls (*Larus delawarensis*) were counted at both ArcelorMittal Steel West and East. A colony of Caspian terns (*Hydroprogne caspia*) was found with around 90 nests. This colony went unnoticed from 2012 to 2015, but was rediscovered in 2017, nesting on the gravel roof of a building.

Continued monitoring at these sites will be used to guide the management of nesting areas for priority species and controlling double-crested cormorants.

### **Marshbirds Northern Indiana**

(Stephanie Beilke, Audubon Great Lakes)

In 2015, Audubon Great Lakes initiated a study of breeding marshbirds in the Calumet region, which comprises the southern coast of Lake Michigan from Chicago, east across northern Indiana to the southwestern tip of Michigan. Study sites were limited to Illinois, but the project expanded the next year to include Wolf Lake and the Grand Calumet River in Indiana. The study expanded again in 2017 to include the Little Calumet River and Indiana Dunes State Park and National Lakeshore. Eighteen survey routes were grouped into one of four sites based on geography: Grand Calumet River, Indiana Dunes, Little Calumet River and Wolf Lake. Surveys were conducted with permission from, and in partnership with, the Hammond Port Authority, DNR, Lake County Parks, Little Calumet River Development Commission, National Park

Service, Shirley Heinze Land Trust and The Nature Conservancy of Indiana. Routes were divided into four to 10 points that could be surveyed in a single morning between 30 minutes before sunrise and three hours after sunrise.

In 2017, a team of 12 bird monitors, including Audubon Great Lakes staff, partners, and volunteers, surveyed 128 points on 18 routes. A total of 368 surveys occurred during three two-week time periods from May 1 through June 15. Each survey consisted of five minutes of passive listening followed by five minutes of audio broadcast of vocalizations of five target species: common gallinule (*Gallinula galeata*), least bittern (*Ixobrychus exilis*), pied-billed grebe (*Podilymbus podiceps*), Virginia rail (*Rallus limicola*) and sora (*Porzana carolina*).

Rails and bitterns, which included both target and non-target species, were detected at 38% of the points in the Indiana Calumet region. Sora had relatively high occupancy at Little Calumet River (detected at 67% of points) and Indiana Dunes (detected at 42% of points). Virginia rail was detected at 21% of the points at Indiana Dunes, whereas least bittern was detected at 24% of the points at Wolf Lake. American bittern was heard at one point on Wolf Lake and two in the Grand Calumet River complex. A king rail was detected only once, also in the Grand Calumet River, which was the first detection of this marshbird in the three-year span.



*A king rail in early June. (Photo by David Gruver)*

Because this suite of marshbirds is responsive to the quality and composition of wetland vegetation, habitat features are likely key factors that influence where they occur in the Calumet. Results from surveys in 2015 and 2016 suggest wetlands and marshbird populations in the Calumet are in relatively poor condition. However, 2017 detections of American bittern, least bittern, king rail and Virginia rail (all endangered species in Indiana) may indicate positive change in the region. Further study is needed to understand the relationship between marshbird occupancy and habitat quality in the Calumet. Audubon Great Lakes, with partner organizations including the DNR, will begin to collect detailed habitat and landscape data in 2018. This information will advise land managers of important habitat characteristics to consider when restoring wetlands for breeding marshbirds. Southern Indiana Marshbirds are a diverse group of birds that include bitterns, rails, gallinules and grebes. These species are difficult to survey because they reside in dense emergent vegetation and are inconsistently vocal during the breeding season. Little is known about their numbers, population trends, or responses to habitat changes and land management practices.

Playbacks of vocalizations were occasionally used in Indiana to determine the distribution and relative abundance of marshbirds. In 2010, the Indiana office of the National Audubon Society established a longterm survey at Goose Pond FWA in Greene County. This 9,000-acre property of shallow wetlands, ditches and upland grasslands provides abundant habitat for rails and bitterns. Surveys were conducted to determine marshbird presence and relative abundance and how species diversity and populations change over time. In 2012, the DFW assumed responsibility for the survey and also established a second survey area at 840-acre Tern Bar Slough Wildlife Diversity Area (WDA) in Gibson County.

DFW staff and volunteers conducted surveys during three two-week periods from mid-April through May. Participants visited a series of predetermined points and listened for target species for 11 minutes per point. They listened silently for the first five minutes and played calls of each target species during the final six minutes to increase the likelihood of a detection. Target species included American bittern (*Botaurus lentiginosus*), least bittern, king rail (*Rallus elegans*), Virginia rail, sora and black rail (*Laterallus jamaicensis*).

In 2017, 26 points on eight routes at Goose Pond FWA were surveyed during the first two survey windows and 35 points in the last. Nine points on two routes at Tern Bar Slough WDA were surveyed in the first two periods, while six points were surveyed in the last. A total of 150 detections of target species were heard in 2017, a 44% increase from the 104 detections in 2016. All target species were detected except for black rail. Due to annual variation in survey effort, results are represented by the number of marshbird detections per survey point visit. Using this estimate, 1.35 marshbird detections were made per survey point visit in 2017, compared to 0.99 in 2016.

As has been the case since surveys began, American bitterns and soras were the most commonly detected target species at both locations. In 2017, American bitterns, king rails and soras were detected more frequently at both Goose Pond FWA and Tern Bar Slough WDA than in 2016. Trend lines suggest that American bittern detections are increasing at both sites, whereas sora detections are decreasing. However, data are insufficient to draw trend conclusions with high confidence.

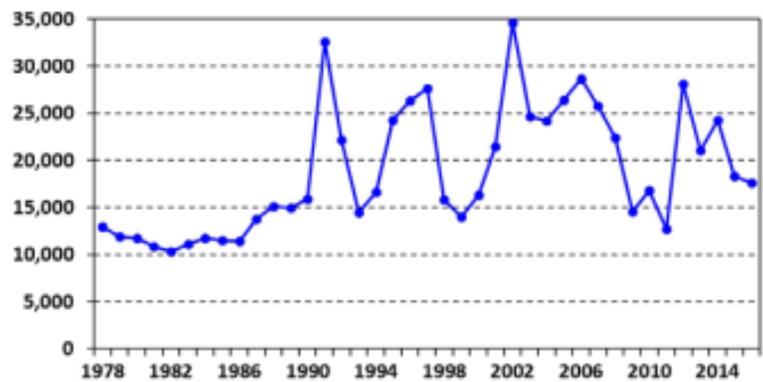
The few detections of least bittern, Virginia rail, king rail, and black rail are expected because all rail and bittern species except sora are endangered in Indiana. Loss and degradation of wetland habitats are primary factors driving these population declines. However, restoration projects such as Goose Pond FWA and Tern Bar Slough WDA demonstrate that quality wetlands can be restored. The few detections that were made of marshbirds at these sites demonstrate that wetland birds can discover and use these habitats, and wetland restoration projects are of immense value to state endangered wildlife.

## Sandhill Crane

The sandhill crane (*Antigone canadensis*) is a longlegged, long-necked waterbird sometimes confused with the similar-appearing, but unrelated, great blue heron (*Ardea herodias*). During fall and spring migration, groups of 50–100 sandhill cranes are often seen flying high in a loose V-formation, circling to catch updrafts, or descending to a field to feed or roost for the night. A single crane is usually seen with its mate or family group, or in flocks numbering from a couple of dozen to the hundreds. Their bugling calls are usually heard before the flock is seen.

The eastern population of sandhill cranes nests in marshes in the upper Great Lakes states and southern Canada. Since the early 1980s, that population has been expanding, with increasing nesting in northern Indiana. Breeding pairs are sighted during the summer as far south as Wilbur Wright FWA in Henry County and Goose Pond FWA in Greene County. Sandhill cranes are expected to expand their breeding range throughout southern Indiana as the eastern population continues to increase in size.

The USFWS coordinates annual fall surveys of the eastern population to monitor changes in abundance. Much of the population stops at Jasper-Pulaski FWA in northwest Indiana before continuing south to overwinter in Tennessee, Georgia and Florida. Each fall, public properties and other areas with a history of stopovers are surveyed during two periods starting on October 28 and November 9. Surveys in 2017 were underway at the time this report was compiled. The following represents survey results from fall 2016.



**Annual peak number of sandhill cranes counted during fall surveys at Jasper-Pulaski FWA, 1978–2016.**

The number of sandhill cranes migrating through Indiana in 2016 was greater than that observed the previous year, despite having surveyed fewer sites. A total of 12,435 cranes were counted at 14 sites during the first survey period in 2016 (8,593 in 2015). Jasper-Pulaski FWA hosted the most cranes (8,060). Fewer birds were present at the NIPSCO power plant (1,906), a private property next to Kingsbury FWA (1,305), Pigeon River FWA (964), Boot Lake (180), Pisgah Marsh (9), Willow Slough FWA (5), Muscatatuck NWR (4) and Goose Pond FWA (2). No cranes were observed at Kingsbury FWA, Atterbury FWA, Brookville Lake, Ewing Bottoms in Jackson County, or Monroe Lake.

During the second period, 18,574 cranes were counted (10,920 in 2015) at 15 sites. Jasper-Pulaski FWA again had the most birds (10,985). Fewer cranes were observed at the NIPSCO power plant (3,584), private property next to Kingsbury FWA (2,450), Pigeon River FWA (1,154), Muscatatuck NWR (200), Boot Lake (137), Brookville Lake (24), Pisgah Marsh (17), Goose Pond and Willow Slough FWAs (7 each), Tri-County FWA (6), and Kingsbury FWA (3). No cranes were seen at Atterbury FWA, Ewing Bottoms, and Monroe Lake.

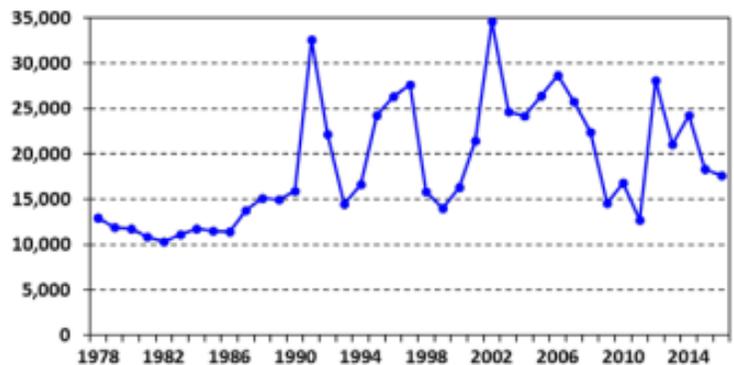
In addition to the USFWS fall count, weekly crane surveys were conducted at Jasper-Pulaski FWA. Counts exceeded 6,000 birds by the end of October and more than 10,000 were observed in mid-November. The survey ended on December 13, when crane numbers were at their peak (17,600 birds). Because surveys ended, this date was considered the peak abundance, although additional cranes may have arrived later. This figure is below the average 10-year high of 21,725 cranes at Jasper-Pulaski FWA, perhaps because the survey ended before an actual peak was reached.

### Whooping Crane Conservation

One of the rarest birds in the world, whooping cranes (*Grus americana*) migrate through Indiana in spring and fall and often overwinter in our state's wetlands. Standing five feet tall, whooping cranes are easily identified by their size and their dark red crowns and black mustaches, which contrast against their almost entirely blank canvas of snowy, white feathers. Their beautiful plumage and size grab viewers' attention, especially when they mix with a flock of their smaller, drabber cousin species, the sandhill crane.

Whooping cranes that migrate through Indiana are part of the experimental Eastern Migratory Population (EMP). This effort was started in 2001 by state and federal agencies and non-profit organizations to reintroduce a self-sustaining migratory population of whooping cranes to the eastern United States. Most birds in the EMP are marked with unique colored leg band combinations so individual birds can be identified from a distance with spotting scopes or binoculars. Some birds also

carry satellite or radio transmitters that are used to follow migration but have a limited lifespan and must be replaced occasionally. Tracking improves our understanding of crane migration ecology and the threats cranes face throughout their life cycle. In February 2017, DFW biologists worked with the International Crane Foundation, the Whooping Crane Eastern



**Annual peak number of sandhill cranes counted during fall surveys at Jasper-Pulaski FWA, 1978–2016.**

Partnership, and Operation Migration by assisting in the capture of an adult female crane. Her faulty radio transmitter was replaced with a working unit, and a dead satellite transmitter was removed. After release, she was closely monitored and behaved normally with her mate.

In fall 2017, the EMP consisted of only 101 whooping cranes. These birds nest in Wisconsin, where breeding has been plagued by predators, parasitic black flies, infertility, and nest abandonments. Because the EMP is not self-sustaining, it is augmented annually by a handful of young birds that are introduced to the wild in various ways. The most renowned technique, when birds are raised by humans dressed in white crane costumes and taught to migrate by following an ultralight aircraft, was discontinued after 2015. Currently, two chicks that hatched in the wild in 2017 in Wisconsin continue to survive. Six additional chicks will be released singly or in pairs near wild adult cranes that lack chicks. This technique, termed parent-rearing, allows chicks raised by captive crane parents to later be adopted by wild pairs. Hopes are high that parent-reared chicks will be better at raising their own chicks and avoiding predators.

It is crucial that humans view these endangered birds from a distance and do not attempt to approach or feed them. Whooping cranes that learn to approach vehicles for food often die after being hit by cars. Illegal shooting is also a concern—several cranes were shot by poachers in Indiana. You can help to conserve whooping cranes by keeping a distance of at least 100 yards and reporting any activity that attempts to harm or disturb these magnificent birds.



***Whooping cranes are a rare and endangered bird species that winters in Indiana. This photograph was taken with a large telephoto lens from a blind to avoid disturbing the birds. (Photo by Dan Kaiser)***

# 2018 Survey and Management of Interior Least Terns in Indiana

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## Executive Summary

This summer, the Midwest received a large amount of rainfall that elevated river water levels from early June until the middle of July. Least Tern nesting habitat was absent on both sand bars and islands of the Wabash River during this period. Usual preparations were made by the U.S. Fish and Wildlife Service (USFWS) to attract Least Terns to the Cane Ridge Tern Pond (CR) located in Gibson County, Indiana. Least Terns successfully nested on both islands. Adequate water was provided to Cane Ridge all season. Because of continuing problems maintaining adequate water levels at Tern Bar Slough (TBS), this area was not prepared by the Indiana Department of Natural Resources (INDNR) who manages this site. On Duke Energy property, methods to attract terns were used only on the Splitter Dike (SD) in the Gibson Cooling Pond (GCP). Human access was restricted to all former as well as possible new nest sites on Duke Energy property. Least Terns nested on the SD in three distinct colonies, but none of the colonies produced fledglings. All Ash Pond Complexes and borrow pits were checked weekly. Terns were often seen on some of the borrow pits, but no nesting was detected.

Least Terns were first seen 11 May at Cane Ridge. The last observation in southwest Indiana was of one adult at Cane Ridge on 17 August. An estimated 101 nests were found at the CR-GCP complex with 56 first nesting attempts and 45 later attempts. On 8 June, a peak of 140 adults was noted. This number includes an estimated 30 to 40 adults that were not associated with a nesting colony and appeared to be passing through. The total estimate of fledglings produced was 42. No chicks fledged on the Splitter Dike, where an average of about 12 adults and a total of 16 nests were found. The 100 adults at Cane Ridge produced an estimated 42 fledglings from approximately 85 nests. Terns nested successfully on the dikes at the ash ponds south of the AEP Power Plant near Rockport, Indiana for the 16th year. Sixty-one nests were noted with a maximum of 50 adults present. Five chicks were estimated to have fledged. Least Tern nesting did not occur on the sandbar island in the Ohio River. Least Terns nested for the sixth year at Goose Pond near Linton, Indiana. A maximum of 17 adults produced 8 nests, and 9 fledglings. No nesting was found this year in the Wheeling Bottoms although terns were occasionally observed. Least Terns were seen in late May at the coal mine sludge pond north of Owensville but there was no indication that breeding occurred. Two juvenile Least Terns were seen in early September at Miller Beach in Gary, Indiana. There was no activity detected at Ben's Spot. Because of high water, the Wabash River was not checked for Least Tern activity until near the end of the nesting season. Nests, adults, and fledgling Least Terns were found during the river surveys. The surveys on 25 July and 26 July found two breeding colonies on

sandbars. One was below the Indiana 62 bridge and had 20 adults, 2 possible nests, and 2 confirmed nests. Ten more adults with 2 fledglings were found at nearby locations. A breeding colony was found just north of the large island below Crawleyville. There were 12 adults, one confirmed nest, and one fledgling. Both areas were checked on 2 August and the colonies were gone.

The total estimates for all the known sites in Indiana in 2018 was a peak of 179 adults, 170 nests (86 first nests and 84 second nests), and 56 fledglings. There were more than 100 fewer adults than last year. Presumably the birds that were missing were from the Splitter Dike colonies. The number of nests and fledglings were estimated conservatively. Some of the sites experienced either serious predation or weather-related issues with loss of nests and chicks.

## **Results**

The first sighting of Least Terns this year was of five adults seen by Heath Harlan at Cane Ridge on 11 May. Terns were first seen on the SD on 21 May. By early June most of the locations traditionally used by the terns had breeding colonies in place. For the second time in 24 years, terns did not nest at the end of the dike. Terns have not nested on any of the ash flats associated with the CCR since 2015. No Least Tern nests were found in the Wheeling Bottoms although they were often seen during the season. The last tern sighting in southwestern Indiana was of an adult on 17 August at Cane Ridge. Remarkably, two juvenile plumaged Least Terns were seen at Miller Beach on Lake Michigan from 3 September to 5 September by several observers. It was reported that the birds were seen catching small fish. No adults were seen. The birds were photographed. A single juvenile Least Tern was seen from the 19<sup>th</sup> to the 23<sup>rd</sup> of September last year at Michigan City.

**Splitter Dike:** Because of HCP guidelines, all trips were made when temperatures were below 90 degrees. Time spent in each nesting area was limited to less than 15 minutes. When weather conditions allowed, and activity was noted, the dike was walked in order to measure Least Tern breeding activity. Dates of pedestrian surveys were required to be separated by at least four days in order to reduce direct disturbance to nesting birds. However, tern activity on the dike could still be observed from other locations on dates within this period (i.e. from the old boat ramp area, as well as driving on the Splitter Dike to within 100m of the first colony). All nests found on the dike were marked with a numbered rock located 10 feet north of the nest. All nests were checked on each pedestrian survey. There were three areas of nesting: First Green (FG) which was located about 50 yards past the first green area, First Turn (FT) which was located about 300m past the first green area for a distance of 100m and Turn Around (TA) which was located from the turnaround at the middle of the dike to about 100m past it. There was evidence of nesting at the End during the last week of June, but by the time that weather conditions allowed a pedestrian survey, the colony appeared to have been depredated. There were seven possible nesting scrapes observed.

Least Terns were first noted on the dike on 21 May when there were 5 adults recorded at the FG. Twenty adults with six nests were found in the TA on 31 May. Later surveys found no more nests and found that the number of active nests were declining. The average number of adults seen was about 12. One nest hatched two chicks on 19 June. It is believed that this was the only nest on the dike that hatched. There was no activity at TA on or after 27 June. A nest was found at FT on 25 June. Eight nests were eventually found, but like the nests at TA, they lost eggs and were gone by 13 July. Two nests were found 13 July at the FG location. Neither hatched any chicks. One was gone by 23 July and the other was abandoned by 28 July. Although there were adults with fledglings observed on the dike, none were believed to have originated there.

Predation on the dike this year was suspected to be the primary cause of reduced breeding success. Photos from trail cameras showed a snake near one of the nests at night, but the species of the snake was undetermined. Several nests were empty and found to only contain dried yolk. However, trail cameras failed to catch images of mammalian predators. Peregrine Falcons were not seen during the nesting season. There were far fewer Turkey Vultures on the dike this year compared to past years. There were even some surveys in which none were seen. Overall, there was no hard evidence for what caused these nest failures.

The totals for the dike were a total of 16 nests. The average number of breeding adults was only 12. Six of the nests were first attempt (herein, “first”) nests and 10 were second attempt (herein, “second”) nests. The breakdown by colony is as follows: the TA colony had 6 first nests and no second nests, the FT Colony had no first nests and 8 second nests, and the FG had two second nests and no first nests. These numbers represent nests found and marked. There was only one nest that hatched producing 2 chicks. This was one of the (TA) first nests. No fledglings were believed to have been produced on the dike. As aforementioned, predation was suspected to be a serious threat to breeding terns on the Splitter Dike. All of the colonies were completely destroyed. This is the first time in the past 25 years that fledglings were not produced on the Splitter Dike.

**Tern Bar Slough:** This area was not prepared for the Least Terns this year. No decoys were deployed and no effort was made to supply water. No breeding behavior or nesting was detected. Terns were seen a few times foraging over the moats. Due to heavy rains in June the moat did retain water and foraging habitat until early July.

**Cane Ridge:** Most observations were either made from the observation deck or by wading to the edge of the island on the water covered access roads. Except for one brief visit to both islands on 16 July to check for possible predation, neither island was entered this year while the terns were present. Adequate water levels were present all season. Enough water was available to supply water to the moist soil units to the south. This gave the terns additional foraging

areas. The water level was lowered starting in late July, but by then most of the terns had left the two islands.

Least Terns were first seen on 11 May. Five were seen flying over the Tern Pond by Heath Harlan. There were about 18 adults present, utilizing both islands on 18 May. Probable nesting was first noted on 31 May. There was a total of 50 adults on Tern Island with 15 possible nests. Ray's Island had 15 adult Least Terns with about 4 nests. By 8 June, there were about 70 adults with 35 probable nests on Tern Island and 25 adults with 12 nests on Ray's Island. The number of adults and nests peaked at 115 adults with 51 nests possible nests on 10 June. The number of adults averaged about 100 until 7 July when numbers started to decline. The number of nests stayed at about 40 to 50 until after 22 June when most of them started hatching chicks. The first chicks were seen on 22 June. There were at least 2 chicks on Ray's Island and one was seen on Tern Island. The first fledglings were observed on 8 July. There were 3 seen on Tern Island and one on Ray's Island. By the end of June, several chicks were seen on both islands and the number of probable nests dropped to 20 on Tern Island and 5 on Ray's Island. There were still about 70 adults on TI and 30 adults on RI. On 7 July, two fledglings were seen on RI. Adult numbers dropped in July. Very few older fledglings were seen, indicating that adults were taking the fledglings away from the islands. Adults with fledglings were seen in July on the borrow pits, boat ramp, and the Splitter Dike. It is believed that these were from CR. Also, the fledglings seen on the Wabash River are believed to have come from CR. There did not seem to be many second nesting attempts, but the heavy growth of vegetation made seeing the nests difficult.

Danielle Williams and Bill McCoy waded out to both islands on 16 July in order to do a pedestrian survey. They were on each island for less than 20 minutes. I observed from the end of the access roads. Ray's Island had an estimated 25 adults, 4 fledglings, and about 10 chicks. They found one nest with 3 eggs and only one chick. I was able to see chicks running away from them and then hiding. The fence vegetation was well controlled by the herbicide applied in May on both islands and not affecting the electric fence. Something had unsuccessfully tried to burrow under the fence on Tern Island. There was no indication of predation on either island. Tern Island had about 30 adults, 5 chicks seen, and only one fledgling. One large chick was seen on the pedestrian survey. All of the fledglings seen seemed to be less than a week old. It would seem that the adults were moving their fledglings soon after they were able to fly. There were a few adult Least Terns and fledglings present through the middle of August. The last observation at Cane Ridge was of one adult on 17 August.

**Ash Disposal Areas and Borrow Pits:** No Least Tern activity was detected on either the north or the east Ash Pond Complexes. Least Terns were often seen foraging or resting in the new borrow pits located along the county road to the east of the Gibson Station entrance road. Up to as many as 10 were seen. There was no evidence of breeding. The area was being used for

foraging. The new borrow pits on the south end of the South Landfill were used most of the season by Least Terns. Again, there was no evidence of nesting. On 8 June there were 40 Least Terns on the east end of Borrow Pit #A. Least Terns were often seen foraging over Borrow Pit #A and Borrow Pit # B. Borrow Pit #A was being pumped out during the summer, creating shallow water foraging habitat. Often adult Least Terns with fledglings were observed there after 7 of July.

**Wabash and White River Surveys:** The Wabash River was periodically high from the first week of June until the middle of July. It was assumed that any early breeding that might have occurred there would have been destroyed by high water levels. Wabash River surveys were done on 25 July and 26 July. A survey of the White River was done 2 August.

July 25: John Pike, Danielle Williams, and I surveyed the Wabash River from Harmonie State Park to the Ohio River in the Duke Energy airboat. We covered approximately 39 miles of the river. We observed Least Terns in three locations throughout the trip. Approximately 20 adults were associated with a breeding colony on a large sandbar in Indiana. This was about a mile downriver from the Indiana 62 bridge. We observed 4 possible nests and located 2 nests with 2 eggs each. We did not find any chicks or fledglings at this location. We observed 4-5 additional adults within about a mile of the colony. We also located 6 adults and 2 fledglings on a sandbar in Illinois. We did not observe breeding behavior at this location. We observed one tern flying upriver of Harmonie State Park near the old dam.

July 26: Liz Haig, John Pike, and I did a survey of the Wabash River from Crawleyville to the I-64 Bridge. We ran 23 miles of the river. We found Least Terns just north of the two large islands that are downriver from Crawleyville. There were about 15 to 20 present. Our maximum count was 12 but we did see several others foraging downriver within a mile of the site. We saw one 2 egg nest. We observed one fledgling. We also saw a pair copulating. Others were engaged in breeding behavior. The location is in Illinois but very close to the Illinois-Indiana border. The birds were flying back and forth over the border.

August 2: John Pike, Danielle Williams, and I surveyed the White River from Hazelton to a few hundred feet past the I-69 Bridge. We also went up the West Fork for about half a mile. We did not see any Least Terns. We noted about three areas of potential habitat about 10 miles up the river from Hazelton. They were higher sand and gravel banks with no ATV tracks. There have been reports of Least Terns on or near the White River in Gibson and Pike Counties for several years.

August 6: John Pike, Danielle Williams, and I rechecked the Wabash River sites where nesting had been discovered last month. The location below the Indiana 62 bridge (where two nests with 2 eggs each were confirmed and two more possible nests were seen) was mostly

abandoned. We saw two adults do a brief flyby. This location is in Indiana. The area had been very heavily crisscrossed with ATV tracks since we had been there. We had recorded about 20 adults here the previous month. The location composed of several large islands that is about 5 miles downriver from Crawleyville was also abandoned. The nest that was found the previous month was just at the edge of a slight rise of the river. No eggs were found. There were 12 adults with 2 fledglings nearby. These fledglings were very young and were probably a different group from the ones seen here the previous month. There was no sign of human interference. This location is perhaps the best natural Least Tern habitat in the region. It is surrounded by water and is composed of sand and gravel with almost no vegetation. It is located about 200 feet to the west of Indiana in Illinois.

**Ben's Spot:** No Least Terns were seen. The area was planted in corn by the first of May and no Least Tern habitat was present.

**AEP Rockport:** In 2002, Least Terns were seen on an island in the Ohio River near Grandview in Spencer County. In 2003, they successfully nested and raised chicks at the AEP power plant in Rockport. In 2004, Least Terns were seen most of the season but no nesting sites were located. Least Terns have nested successfully every year since 2005. This year, Least Terns again nested at AEP. David Ayer and Danielle Williams did most of the site monitoring.



**Nesting Least Tern at AEP Rockport 08 June 2018. Photo by David Ayer.**

The electric fence was repaired in early May and seven (7) decoys were deployed. Least Terns were first observed on May 19th when 4 birds were observed. Courtship was also observed. The high count of adults came on July 22nd when 50 were observed. After that numbers began to decline and the last time that birds were observed was on August 4th. Nesting was confirmed on June 2nd when a single nest was confirmed. Chicks were first observed on June 23rd when a single hatchling was seen. This high count of chicks came on July 28th when 10 chicks were observed. The first fledgling was observed on July 14th. The high count of 2 fledglings came on August 4th.

Over the course of the season 61 nests were confirmed. The nests contained a total of 132 eggs. 17 of the nests were on the south road, 26 were on the north road, and the other 18 were on the east/west roads. It is estimated that 25 of the nests were first attempts and the rest were second nesting attempts. Over the course of the season at least 20 chicks were observed. This is probably an undercount as they are hard to observe when hiding in the rocks. It is estimated that at least 5 birds fledged. There was photo documentation of coyote predation. Both a raccoon

and a skunk were photographed in the colony, but neither were photo documented depredated nests.

**Goose Pond:** Least terns have been seen several times in the past foraging at Goose Pond and in 2013 nesting was proven for the first time. Least Terns again nested there this year. Amy Kearns collected most of the data for Goose Pond.

Goose Pond FWA had a high of seventeen adult least terns this season, eight confirmed nesting attempts, and nine confirmed fledglings. This year marks a new high count in adults (vs. sixteen in 2017), nesting attempts (vs. six in 2016 and 2017), and fledglings (vs. four in 2015). Predator pressure was monitored using nest cameras throughout the nesting season, but no predation events were observed. There did not appear to be any weather related issues and first nesting attempts were largely successful, with most adults and fledglings dispersing on or before 21 July. A re-nesting attempt occurred in early July that successfully produced two additional fledglings in August.

**Other Indiana Locations:** The nesting location that was discovered four years ago in the Wheeling Bottoms north of Francisco was used this year only for foraging. There was courting behavior observed once on 27 June and a possible nesting attempt occurred. The researcher was heavily harassed but a 20-minute search did not result in a nest discovery. A survey the next week did not find any Least Terns. A set of four adults with three fledglings was seen 10 July. Road side searches did not find any other suspected breeding locations. Because of the question of providence for the fledglings this data was not used in the summary data reports. A mild flooding of the Patoka River occurred in early July creating Least Tern foraging habitat. Up to 16 adult Least Terns were seen in the Wheeling Bottoms at this time. A few Least Terns were also seen in the Oatsville Bottoms.

Least Terns were again observed using a coal mine slurry pond about three km north of Owensville, IN. Up to 12 were seen in May but there were no sightings after the first of June. No nesting was believed to have occurred. Successful breeding was seen here last year.

Two juvenile Least Terns were discovered by Ryan Sanderson at Miller Beach on Lake Michigan on 3 September. The birds were seen until 5 September. The birds were photographed. They were seen actively foraging. There were no adults. The origin is unknown. A single fledgling was also seen last year 19-23 September at Michigan City.

## **Discussion**

For many years, I had been pointing out that the best situation for Least Tern nesting success would be the creation of island-like structures in ponds large enough to provide some safety from land-based predation. The idea was realized through the cooperation of Duke and state and federal wildlife agencies. Tern Island and Ray's islands were built in the Tern Pond at Cane

Ridge, just south of the Gibson Cooling Pond. Tern Island was first readied for nesting in 2005 and Ray's Island was ready in 2006. These islands provided some measure of safety because of the presence of fences and electric wiring that greatly reduced the possibility of mammalian predation. Least Terns quickly adopted the two islands and a major nesting colony has been present eight of the past nine years. A problem with selenium resulted in the islands being off limits to the terns in 2008. This was resolved somewhat in 2009 when water from the Wabash River was pumped to the Tern Pond.

Pump problems had plagued the project for several years. There had been many problems with keeping the pump functional. A new larger pump was placed in service during the 2015 nesting season. It was also situated lower in the sump-well next to the river. This allowed pumping water when the river was low. Prior to 2015, the pump was unable to supply water when the river was low, which is a common occurrence in the summer. The pump was on-line through the 2018 nesting season. The original pump has become a backup, but was not needed this year. No mechanical issues were experienced.

The two tern islands at Cane Ridge also provide an excellent way for people to safely view Least Terns during the breeding season. There is probably no place in the interior United States that gives easier public access to Least Terns. Least Terns could be reliably seen there until August.

In 2008, two more islands were opened for Least Tern nesting. These were on state property (TBS) and were used only in 2008 for nesting. The water retention issues with the moat severely hurt these efforts to attract Least Terns to this site. No efforts were made this year to attract Least Terns and the area only saw a few foraging visits by terns.

With Least Terns nesting in such close proximity to major human activity, it is evident that management of the nest sites is important to the continued success at both the Gibson and the Rockport areas. Suitable sites need to be maintained. Least Terns need to be attracted to these areas and protected from both animal predation and human disturbance. If the terns nest away from these areas, they need to be located and protected.

A complete analysis of the first 13 years of the Least Tern activity in southwestern Indiana can be found in Castrale et al. (1999). This study indicates that tern productivity reached 0.97 fledgling/nest during 1993-1998 and that this is greater than that reported from most other locations.

Kirsch and Sidle (1999) indicate that a rate of 0.51 fledglings/pair figure is necessary to maintain a healthy population. The rate at the CR-GCP complex for 2018 was .750 fledglings/pair. A pair was determined by dividing the average number of adults by two. The

Splitter Dike produced 0.00 fledglings/pair based on 6 pairs and no fledglings. Cane Ridge was .845 fledglings/pair based on 50 pairs and 42 fledglings. The average in the 32 years that the Gibson colony has been under study is 1.07 fledglings/pair. This is based on a total of 1535 pairs and 1650 fledglings. Since 1993, when a larger colony became established, the number has had a low of 0.15 fledglings/pair in 2001 and a high of 2.20 fledglings/pair in 2010. No banded adults were seen this year. Earlier observations noted that most of the recruited adults at Gibson came from the Mississippi River nest sites.

Rockport produced .200 fledglings/pair based on 25 pairs and 5 fledglings. There were 9 fledglings produced by 8 pairs at Goose Pond resulting in 1.13 fledglings/pair. The overall result from Indiana was 56 fledglings/89 pair = 0.629. This is below the long-term average, but above the suggested rate of 0.51 fledglings/pair, which maintains a healthy population of Least Terns (Kirsch and Sidle 1999). Last year in 2017, the number was 0.898 fledglings/pair.

### **Acknowledgments**

The U S Fish and Wildlife Service played an important role in this year's study. Heath Hamilton and Bill McCoy deserve big thanks for all their hard work. The cooperation among all involved (Duke, state, and federal) as always was great.

A special thanks goes to volunteer Liz Haig who worked closely with me all season. She donated over 100 hours of her time to the project this year. Her enthusiasm for working with the terns was very contagious.

The cooperation and enthusiasm of Duke Energy personnel towards Least Tern management was greatly appreciated. There was always 100% cooperation with tern management problems. Special thanks go to John Pike and Rebecca Sparks from Duke Energy. John also help me greatly in the preparation of this report. A very special thanks to the security personal at Gibson Station who went way out of their way to help protect the tern colonies and to making access to the them easy for the researcher. Thanks should also go to David Ayer who found and has helped to study the AEP and the Ohio River nesting site. The following three Indiana Department of Natural Resources personnel played a large role in the success of the study. Thanks go to Allisyn Gillet for her participation and advice both during the study and during the preparation of this paper. The paper is much better because of her great editing work. Danielle Williams, an intern with IDNR, helped at all the main study areas: Gibson Station-Cane Ridge, Goose Pond, river surveys, and AEP. Her help and enthusiasm with the project is greatly appreciated. Amy Kearns deserves a big thanks for all of the work that she did with the Tern Island at Goose Pond. The Indiana Nongame and Endangered Wildlife Program funded this study.





