



**INDIANA AUDUBON QUARTERLY  
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Cover photo: California Gull at Michigan City Harbor, *LaPorte County*, on 31 August 2016.

Photo by John Cassady.

Back cover photo: First year male Hooded Merganser having a good hair day at Eagle Creek Park, *Marion County*, on 19 January 2017.

Photo by Chuck Anderson.

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## Letter from the Editor

By Brad Bumgardner

2017 is here, and that means new annual lists, new birds to be seen, and new opportunities to contribute to both scientific bird research and simple citizen science. For me, I'm excited to provide the first IAQ of the New Year, and my second as editor of this valuable publication. One thing I've learned is there are many people in the state providing a valuable resource to the state's ornithology via articles, birding reports, or contributing to the state's many bird counts.

The Christmas Bird Count, whose data has now been compiled for over one hundred years is providing a real look into birding trends. While some birds are showing losses annually, many birds are showing upward trends. The news is both good and bad. Other, newer counts also offer a chance for citizens to give scientists a snap shot look at where the birds are at a particular moment. Consider joining the Great Backyard Bird Count if you are not already. Data entry is easy with eBird.com.

One article for a future issue will look at the best birding sites in Indiana. Everyone has their favorite park or patch that they think is great for various reasons. But, what does the science say? How does user bias influence the total species list and how much does a site really provide an oasis for migrating birds?

As we make our way into 2017, consider providing content to the Indiana Audubon Quarterly. You might submit sightings to our field note editors, or write a synopsis of your favorite birding sites. Perhaps you're doing research on a bird species in the state. All of these are valuable information that we can share to the membership and archive for later reference by those younger and wiser than us today.

Happy Birding!



**Birders participate in the Christmas Bird Count in 2016.**

# Fall Indiana Field Notes 2016

By Kim Ehn, Chesterton, IN

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August saw record warm temperatures and wetter conditions, including the 9<sup>th</sup> warmest and the 4<sup>th</sup> wettest month in Indianapolis since 1871. Abnormally dry conditions plagued some NE and W counties. The record for the most August tornadoes was set at 18, occurring on the 15<sup>th</sup> and 24<sup>th</sup> of August. September continued the warm temperatures with the passage of fronts on the 9<sup>th</sup> and 25<sup>th</sup>, providing some relief. Cooler weather patterns helped the dryer areas of the state. October temperatures were 5 to 8 degrees above normal. A cold front on the 19<sup>th</sup> brought in the coldest overnight lows. The southern parts of the state saw little precipitation. November was the 8<sup>th</sup> warmest month in Indianapolis. Cold fronts came through on the 2<sup>nd</sup>, 8<sup>th</sup>, and the 18<sup>th</sup>. Porter County was the wettest with a 5 inch rain total. The east central and south east parts of the state suffered moderate to severe drought conditions.

Temperature & Precipitation at Indy: Departure from Normal		
	Temp (°F)	Rainfall (in.)
Aug	+4.0	+4.19
Sep	+4.4	+1.55
Oct	+5.7	-1.16
Nov	+4.5	-0.93

The abnormal temperatures across the state may have encouraged a late passerine migration, a dull lake watch season, and few of the rarities and winter finches that birders hope for. The fall of 2016 ended with only a trace of snow (on one day) and all water fully open. Highlights, however, included Black-bellied Whistling Duck, Pacific Loon, Swallow-tailed Kite, Yellow Rail, California Gull, and Townsend's Solitaire.

The editor is indebted to Dr. Ken Brock for his statewide fall report, and Neal Miller for "The Michiana Meadowlark". Both were used in compiling this year's Fall Field Notes.

Photos provided by Michael Brown, Cindy Breedlove, Michael Topp, Shari McCollough, John Lindsey, Bob Huguenard,

## Abbreviations:

FWA = Fish & Wildlife Area

NA = Nature Area

NWR = National Wildlife Refuge

SP = State Park

SRA = State Recreation Area

GHA = Game Bird Habitat Area

WDA = Wildlife Diversity Area

WMA = Wildlife Management Area

WTF= Wastewater Treatment Facility

**Black-bellied Whistling-Duck** - 2 flew by Michael Topp on 19 Aug at Miller Beach, Lake, making this the Lakefront's second record.

Greater White-fronted Goose- Bob Decker had 4 flocks flyover at Miller Beach, Lake, on 17 Oct, for a high count of 147.

Snow Goose- Ryan Sanderson reported 25 on 21 Nov at Miller Beach, Lake.

Ross's Goose – A high count for the year of 5 was reported by Rhiannon Thunell on 20 Nov in Johnson County.

**Brant** – 1 juvenile found by Alan Bruner on 16 Sept at George Lake (Hammond), Lake. It was the first fall bird seen in 15 years and Indiana's earliest fall record. Stayed through 20 Sept for other birders to see.



**Brant at George Lake, Lake Co. on September 17. Photo by Michael Topp.**

Cackling Goose – A high count of 4 was reported by Dan Collins on 27 Nov at Cane Ridge WMA, Gibson. A total of 22 were reported for the state.

Trumpeter Swan – High count of 14 on 27 Nov by Matt Kalwasinski, Thomas and Cheryl Bell, at Lake George (Whiting), Lake.

Tundra Swan - A high count of 11 were observed by Kristin Stratton on 25 Nov in La Porte County. The state total of 16 was the lowest autumn total since 7 were reported back in 1988.

Green-winged Teal – DNR staff had the 3<sup>rd</sup> largest state count of 2106 on 10 Nov at Goose Pond FWA, Greene.

Ring-necked Duck - Lakefront's second largest high count of 300 was reported on 26 Nov by John Cassady, Cathy Meyer, Gary Langell, and lake watchers at Miller Beach, Lake.

Harlequin Duck – Landon Neumann had Indiana's earliest fall record on 13 Oct with a flock of 3 at Miller Beach, Lake.

Surf Scoter – High count of 31 on 13 Oct by Landon Neumann at Lake Street Beach, Lake.

White-winged Scoter – 1<sup>st</sup> Harrison County record on 27 Nov at Buffalo Trace Park by Christine Ransdell and photographed by Michael Brown on 29 Nov. 1 at Heritage Lake, Putnam, on 28 Nov by Carl Huffman.



**White-winged Scoter at Heritage Lake, Putnam Co. on November 28. Photo by Michael Brown**

Black Scoter – Lake watchers John K. Cassady, Randy J. Pals, Lynn H. Vernon, Ken Brock & others had Indiana's earliest record on 3 Sept at Miller Beach, Lake, with a single female-plumed bird.

High count of 106 was tallied 20 Oct by Don Gorney, John Kendall and Becky Heck, creating Indiana's 4<sup>th</sup> largest count.

Long-tailed Duck – Individual inland observations included Lake Lemon, Monroe, on 21 Nov by Gary Langell, Celery Bog, Tippecanoe, on 24 Nov by many birders, West Boggs Lake, Daviess, by Michael Brown and Gary Langell on 29 & 30 Nov, and West Boggs Lake, Martin, on 29 Nov by Amy Kearns.

Pacific Loon – Indiana's earliest record and first ever for August on 30 Aug, of 1 at Miller Beach, Lake, on 30 Aug by Landon Neumann. At same location, 1 on 30 Oct by Jeff McCoy and Don Gorney, also seen on 31 Oct by Ryan Sanderson and 2 Nov by Bob Decker. At Marquette Park, Lake, Don Gorney, Eric Ripma, Landon Neumann, and others saw 2 on 20 Nov.

Common Loon - Although this is the fifth consecutive year in with Indiana's fall total is below the average seasonal number, a high count of 152 were tallied by Don Gorney on 11 Nov at Marquette Park, Lake.

Red-necked Grebe – Individual birds reported at Miller Beach, Lake, on 17 Oct by Bob Decker, 21 Oct by John Cassady, 3 Nov by John Kendall and 20 Nov by Eric Ripma. High count of 4 was reported by Laurie Voss on 13 Nov at Eagle Creek Park, Marion.

Eared Grebe – First time in six years that none were reported.

American White Pelican – The 7<sup>th</sup> November record with 1 at Portage Lakefront & Riverwalk, Porter, on 5 Nov by John Cassady, Randy Pals and Ken Brock. 1 at Beverly Shores, Porter, on 7 Nov by David Capp. High count of 950, 2<sup>nd</sup> largest for the state, was reported by Vern Wilkin on 19 Oct at Goose Pond, Greene. It was a record season for this pelican with 6146 reported (STYM=940). Vern Wilkin's tally of (950) at Goose Pond on 19 October, constituted the state's second largest count for the fall season. Flock of 13 by Bruce Glick on 24 Aug at Fiddlers Pond, Goshen, provided the second Elkhart Co record.

American Bittern – Second latest record provided by photograph shown to Brad Bumgardner for bird seen on 2 Nov at Indiana Dunes SP, Porter.

Least Bittern – Jed Hertz found 3 at Bendix Park, St Joseph, on 3 Aug and 4 at Kankakee Sands Marsh, Newton, on 13 Aug.

Great Egret – High count and new high total for November of 45 was reported by Heath Harlan on 5 Nov at Lake Gibson, Polk.

Snowy Egret – Michael Topp reported 1 at 129<sup>th</sup> St Mitigation Pond, Lake, on 16 Sept, providing the 3<sup>rd</sup> latest Indiana Record. 11 counties reported 1-5 birds this season.

Little Blue Heron - High count of 49 was tallied on 23 Aug at Fairbanks Landing FWA, Sullivan, by Michael Brown. 14 counties had observations reported including firsts for Clinton and Scott counties.



Cattle Egret – High count of 12 seen by Ray Brumfiel on 4 Nov in Greene County and a high count of 17 seen by Leon Miller on 19 Oct in LaGrange County. 11 counties reported 1-5.

Yellow-crowned Night-Heron – Carolyn Marsh reported 1 at 129<sup>th</sup> St Mitigation Pond, Lake, on 11 Oct, providing 1<sup>st</sup> lakefront report since 2014.

White Ibis – On 10 Sept, Brad Feaster found 1 adult, the 1<sup>st</sup> since 2007, at Beehunter Marsh, Greene.

White-faced Ibis – 2<sup>nd</sup> latest fall report on 28 Oct by Don Gorney at Goose Pond, Greene.

Swallow-tailed Kite – 1<sup>st</sup> seen on 13 Aug in Pike County by Lowell Hobbes. Then an additional bird joined it and was observed by Stephen Bell on 20 Aug. Gary and Lisa Bowman found the 1<sup>st</sup> one in nearby Warrick County on 21 Aug.



Swallow-tailed Kite on August 14 north of Lynnville, Pike Co. Photo by John Lindsey.

Mississippi Kite – 5<sup>th</sup> highest state count of 9 on 23 Aug in Pike County by Amy Kearns. On 17 Aug, Ed Hopkins found 1 in West Lafayette, which was joined by another and a juvenile, suggesting recent nesting.

Bald Eagle – 501 total were reported around the state.

Cooper's Hawk- On October 8 while conducting a Big Sit at Potato Creek SP, Keith Yoder and Titus Mast tallied an incredible 20. Ken Brock (2006) lists the maximum daily count for fall at eight birds.

Broad-winged Hawk – 4<sup>th</sup> largest state high count of 594 was tallied during a hawk watch at Foster Park, Allen, by David Ward on 25 Sept, exceeding his last year's count of 96. New high count for August of 41 by Amy Kearns in Lawrence County on 19 Aug.

Golden Eagle – Sam Plew saw 1 in Pigeon River FWA, LaGrange, on 1 Nov, and David Beachy reported one in LaGrange Co. on 29 Nov.

Merlin – Michael Topp observed the 4<sup>th</sup> earliest record of 1 on 11 Aug at Miller Beach, Lake. High count of 3 reported at same location lake watch on 27 Oct by Jeff McCoy. A season high of 62 was reported throughout the state.

Yellow Rail - 1 on 6 Oct, at West Beach, Porter, by Brad Bumgardner, Matt Beatty, Kristin Stratton. The lakefront's first report of a live bird (a dead Yellow Rail was found in the Hammond Sanctuary parking lot on 6 October 2012) since 3 were reported at Inland Marsh on 22 April 1988. Ma Martin reported 1 at Goose Pond FWA, Greene, on 15 Oct. There was 1 at Lye Creek Prairie Burn, Montgomery, on 22 Oct by Peter Scott, Alan Bruner, Clint Murray.



Merlin at TNC Kankakee Sands, Newton Co., on 29 September 2017 by Bob Huguenard.



King Rail – Only state report came from Lee Sterrenburg who saw 1 at Goose Pond FWA, Greene, on 26 Sept.

Sandhill Crane – The official DNR count from Jasper-Pulaski FWA, Jasper, was updated 22 Nov at 15,453, continuing a downward trend for the last couple of years.

American Avocet – 3 at Miller Beach, Lake, on 3 Aug, by Matt Beatty. 3 at Michigan City Harbor, La Porte, on 25 Aug by Brendan Grube. 4 on 10 Sep at Miller Beach, Lake, by Landon Neumann.

<b>Piping Plover Records</b>			
No	Date	Location	Observer
1	8-Aug	Miller Beach	R. Sanderson
1	9-Aug	Miller Beach	M. Kalwasinski
1	13-Aug	Miller Beach	R. Sanderson
1	26-Aug	Miller Beach	J. Kendall

Black-bellied Plover –High count of 6 reported at Cane Ridge WMA, Gibson, on 9 Oct by Jesse Graves.

Piping Plover – Reported on Miller Beach, Porter: 1 banded juvenile on 8 Aug by Ryan Sanderson, 1 banded juvenile on 9 Aug by Matt Kalwasinski, 1 banded juvenile 13 Aug by Ryan Sanderson, and 1 not banded on 26 Aug by John Kendall.

Upland Sandpiper – The 4<sup>th</sup> lakefront record of 1 was reported by Brendan Grube on 24 Aug at Michigan City Harbor, La Porte.

Whimbrel - On Miller Beach, Lake, 1 seen on 1 Aug by Matt Kalwasinski and 19 Aug by Michael Topp. Single bird also at Michigan City Harbor, La Porte, on 12 Aug by Bob Decker.

Hudsonian Godwit – High count of 14 on 13 Aug at Miller Beach, Lake, by Jeff McCoy and group.

Marbled Godwit – 1 at Michigan City Harbor on 12 Aug by Bob Decker. Cane Ridge WMA, Gibson, hosted a bird from 10 -12 Sept and Andy Davis saw 1 at Goose Pond, Greene, on 20 Sept.

Red Knot – Lakefront birds included a high count of 4 on 20 Aug, at Miller Beach, Lake, by Michael Topp, and 1 on 27 Aug at



**Red Knot at Miller Beach, Lake Co., on 24 September 2016 by Ryan Sanderson.**

Michigan City Harbor, La Porte, by John Cassady.

Dunlin – High count of 55 on 29 Oct at Miller Beach, Lake, by Michael Topp.

White-rumped Sandpiper- Only 2 observed this fall with both at Goose Pond FWA, Greene, by Gary Langell at on 11 Oct.

Baird's Sandpiper – 6 reported on the lakeshore, poorest record since 2006.

Buff-breasted Sandpiper – Brenden Grube saw 2 on 24 Aug and a high count of 4 on 25 Aug, at Michigan City Harbor, La Porte.

Western Sandpiper – Season’s only bird at Lebanon Sod Farm, Boone, on 27 Aug by Don Gorney.

Short-billed Dowitcher – High count of 16 were logged by Nick Kiehl, Ryan Hamilton, and Ryan Sanderson on 21 Aug at Miller Beach, Lake.

Long-billed Dowitcher – High count of 151 , exceeds last year’s 38, on 19 Oct at Goose Pond, Greene by Don Gorney.

Willet – High Count of 32 was reported by Bob Decker on 12 Aug at Michigan City Harbor, La Porte. The fall total on the lakeshore was 67 with birds arriving 3 Aug and the last reported on 10 Sept. A high count of 10 was found on 13 Aug at Miller Beach, Lake, by Don Gorney.

Wilson’s Phalarope – None reported this season.

Red Phalarope- Michael Topp reported the only bird for the state on 20 Oct at Miller Beach, Lake.

Parasitic Jaeger - 3<sup>rd</sup> largest group of adults ever reported was a flock of 11 light-morph adults at Miller Beach, Lake, on 20 Oct by Don Gorney, John C. Kendall, & Becky Heck.

Long-tailed Jaeger - 1 adult at Miller Beach, Lake, on 31 Aug by Jeff McCoy, John Cassady, and others.

California Gull – Indiana’s 1<sup>st</sup> August record was seen at Michigan City Harbor, La Porte, on 31 Aug by Brenden Grube. It was reported again on 24 Oct by Ryan Sanderson, Matt Beatty, Eric Michael and others. Amar Ayyash also identified an adult at the same site on 20 Nov.

Franklin’s Gull – Lowest totals reported in 14 years.

Black-legged Kittiwake – Miller Beach, Lake had 1 on 11 Nov, seen by Jeff McCoy and 1 on 20 Nov, seen by Eric Ripma.

Sabine’s Gull - 1st inland record in six years was 1 juvenile seen at Lake Monroe, Monroe, on 12 Sept by Amy Kearns and others. One reported at Prairie Creek Reservoir, Delaware, on 20 Oct by Garrett MacDonald and it remained through the 24<sup>th</sup> , as seen by Bob Decker.

Bonaparte’s Gull - A little scarce with only 119 tallied (TYA=153). Leland Shaum found the first one at WWTF on October 10. John Kendall had the high count of 33 in Kosciusko Co. on October 26.



**California Gull at Michigan City harbor, LaPorte Co., by John Cassady on 31 August 2016.**

Little Gull – Picked out of flocks of Bonaparte Gulls, 1 was seen at Indiana Dunes SP, Porter, on 29 Oct by Jeff McCoy and 1 reported at Miller Beach, Lake, on 19 Nov by John Cassady.

Laughing Gull – One at Michigan City Harbor, La Porte, reported by Caleb Putnam and Aaron Boone, on 16 Sept.

Herring Gull- On 15 September Amar Ayyash photographed an 18th cycle adult at Michigan City Harbor that had been banded as a flightless chick on 17 June 1999 on East Chambers Island, Wisconsin. This suggests that Lake Michigan supports a flourishing population of *Larus argentatus smithsonianus*.

Kelp X Herring Gull hybrid (the so-called Chandeleur Gull). This adult returned to Michigan City Harbor on 9 October (Eric Michael) and remained through the season. It has now been recorded annually on the lakefront since 2010.

Black Tern – High count of 294 logged at Miller Beach, Lake, on 10 Sept by John Cassady and Lynn Vernon. Indiana's 3<sup>rd</sup> latest record on 22 Oct of 2 found by Tommy Becker at Sand Pit Lake, Jackson.

Common Tern – High count of 458 logged at Miller Beach, Lake, on 10 Sept by John Cassady and Lynn Vernon.

Eurasian Collared-Dove - High count of 70 by Peter Scott in Terre Haute, Vigo on 26 Nov constitutes Indiana's second largest count.

White-winged Dove - On 31 Aug Eric Stockton photographed 1 in Guion, Parke. This individual lingered through 5 Sept when seen by Amy Kearns and was observed by many.

Short-eared owl – 1<sup>st</sup> of the season at Michigan City Harbor on 31 Oct by Peter Scott.

Snowy Owl – Only one was reported for the fall season. S. Vance observed 1 in Blackford County on 26 Nov.

Long-eared Owl - Annie Aguirre found a single bird being harassed by crows in LaGrange Co. on November 16 for the only report.

Northern Saw-whet Owl – Fall Banding stations throughout the state reported average to above average numbers. At Indiana Dunes SP, Porter, Brad Bumgardner's team banded, or observed, a record 121 Saw-whets. High count of 15 was on 6 Nov, a new daily maximum for the lakefront.

Common Nighthawk – Hoosier birders enjoyed a better than average flight with 1740 reported. High count of 210 by Doug Johnstone in Morgan County on 28 Aug.

Rufous Hummingbird - An adult male was photographed in Marshall Co. on August 17, fide Don Gorney. The bird was a one day wonder and provided the second record for Marshall Co.

Olive-sided Flycatcher – High count of 2 on 18 Aug at Beverly Shores by Brendan Grube and 2 seen on 3 Sept again at Beverly Shores by John Cassady. Randy Pals and Cathy Meyer had 1 at Cowles Bog, Porter, on 26 Nov. State total of 41 exceeds the next highest fall count by eleven birds.



**Olive-sided Flycatcher seen at Falling Springs Bird Sanctuary, Orange Co., by John Lindsey on 24 September 2016.**

Yellow-bellied Flycatcher - Indiana's third latest record on 14 Oct at Lakefront Park & Sanctuary, Lake, by Leland Shaum, Howard Kauffman, and Neal Miller.

Acadian Flycatcher - On 6 October John K. Cassady identified 1 in Forsythe Park, Lake, providing a new latest fall record for Indiana.

Western Kingbird - Indiana's 2<sup>nd</sup> November record & latest fall report of 1 at Universal Strip Mines, Vermillion, on 20 Nov by Paul Switzer, Aidan Rominger, and others.

Scissor-tailed Flycatcher - On October 15, Eric Yoder and Melvin Bontrager identified one in Noble Co.

Loggerhead Shrike – 4 reports came in from the SW part of the state this fall including 2 on 29 Nov, in Daviess County by Amy Kearns and Gary Langell.

Northern Shrike – High count of 2 at Universal Mines, Vermillion, on 29 Nov by Michael Brown. Season total was 5 including Clay, Gibson, Porter and Vigo counties.

White-eyed Vireo - Indiana's 3<sup>rd</sup> highest fall count of 29 reported by John Meredig at Harmonie S.P., Posey, on 11 September.

Warbling Vireo - Jack Stenger reported 4 on Indiana's 8<sup>th</sup> latest date of 6 Oct in Dearborn County. Indiana's first November and all-time late record was found by John Meredig on 1 Nov at Scales Lake Co Pk, Warrick.

Tree Swallow - On 22 Sept, John Cassady, counting by 50's, tallied an incredible 4500 at Wakarusa WTF, Elkhart.

Cliff Swallow- Indiana's 2<sup>nd</sup> latest record on 23 Oct at Tern Bar Slough WDA, Gibson, by Dan Collins.

Cave Swallow – 2 on 18 Nov by Jeff McCoy at Michigan City Harbor, Lake. This date ties Indiana's latest record, which was logged at this location last 18 Nov by Brendan and Pete Grube. Indiana now has nine Cave Swallow records (involving 36 individuals): all have occurred within the tight 11-day window from 8 to 18 November.

Red-breasted Nuthatch – High count of 13 at Indiana Dunes SP on 3 Sept by Brad Bumgardner. Lakefront birders reported 218 for the season, which is the all-time best fall total.

Winter Wren – Highest count in 7 years of 16 on 19 Oct by Michael Topp at Lakefront Park & Sanctuary Migrant Trap, Lake.

Carolina Wren - Only 10 were reported on the lakeshore. This low season total is especially puzzling because the statewide autumn total was a record high with of 2608. A high count of 29 by John Meredig was logged at Harmonie SP, Posey, on 2 Oct.

Golden-crowned Kinglet - On 14 Aug, Will Schaust and Donna McCarty observed 1 male at Eagle Creek Park Ornithology Center, Marion. This is a 1st August record outside of Pigeon River FWA, LaGrange, where they nest.

**Townsend's Solitaire** - Nick Kiehl and Landon Neumann had 1 in Porter County on 30 Oct, providing Indiana's fifth earliest record. John Castrale reported 1 at Spring Mill SP, Lawrence, on 11 Nov, which was photographed by Michael Brown on 17 Nov and lingered through 26 Nov when seen by Amy Kearns. This is Indiana's fifth "inland" record and the first in 12 years.



**Townsend's Solitaire at Spring Mill State Park, Lawrence, Co., 11 November 2016 by Michael Brown.**

Gray-cheeked Thrush - There were 112 tallied for the season. Perry Miller saw 1 at Bonneyville Mill Co. Park, Elkhart, on 3 Sept. High count of 61 in LaGrange County by Marvin Hochstetler on 9 Sept was a nocturnal flight count.

American Pipit - Bruce Glick reported 1 at Wakarusa WTF, Elkhart, on 22 Aug, which is Indiana's 3rd earliest fall arrival date. High count of 118 by Neal Miller on his farm on 22 Nov. Golden-winged Warbler – Indiana's 4<sup>th</sup> latest record was reported at Hayswood Nature Reserve, Harrison, on 11 Oct by Christine Ransdell.

Tennessee Warbler - A poor flight with only 91 tallied for the state. John Miller had 3 in LaGrange County on 21 Aug. Jacob Hochstetler had the high count of 25 in Pigeon River FWA, LaGrange, on 9 Sept.

Nashville Warbler - All-time earliest arrival on 6 Aug by Diana Doyle in Elkhart County. Previous earliest arrival date was 16 August 1955 at Michigan City Harbor, La Porte.

Connecticut Warbler - A record 11 birds were reported this fall; the previous maximum of eight was reported in 2001. John C. Kendall logged a high count of 2 at Lakefront Park & Sanctuary Migrant Trap on 9 Sept.

Bay-breasted Warbler - Record autumn with 69 reported. On 17 Sept, Matt S. Kalwasinski logged a high count of 7, at 4 northern Lake County sites.

Palm Warbler – High count of 6 on 6 Nov by Dan Collins at Cane Ridge WMA, Gibson, which is Indiana's all-time largest November count.

Black-throated Blue Warbler - Record autumn total with 37 reported. John C. Kendall saw a high count of 3 at Lakefront Park & Sanctuary Migrant Trap, Lake, on 2 Sept.

Pine Warbler - The 23 logged this autumn constitute a lakefront record

Yellow-throated Warbler - On 16 Nov, Cindy Breedlove had Indiana's 5th November and 3rd latest fall record in Morgan County.

Prairie Warbler - John Meredig saw 1 along Tow Path Road (Warrick Co) on 13 Oct, for Indiana's third latest fall record.

Black-throated Green Warbler - On 24 Sept, Jeff McCoy and others counted 9 in Whiting Park, Lake, and Lakefront Park & Sanctuary Migrant Trap.

Wilson's Warbler - Miles Zevin observed 1 at Eagle Creek Park, Marion, on 6 Nov, and was Indiana's fifth latest record.

Yellow-breasted Chat - Sam Plew discovered one in Pigeon River FWA, LaGrange, on 5 Sept.

Grasshopper Sparrow - 4 at Reynolds Creek G.H.A. on 6 Aug by John K. Cassidy and others. On 29 Nov, Amy Kearns and Gary Langell photographed 1 at Viking Mine, Daviess Co, which provided Indiana's third latest record.

LeConte's Sparrow - High count of 2 at West Beach, Porter, on 14 Oct by Leland Shaum, Howard Kauffman, & Neal Miller

Fox Sparrow - Lowest fall total since 2006. Michael Topp logged the high count of 4 at Lakefront Park & Sanctuary Migrant Trap, Lake, on 19 Oct.

Scarlet Tanager - Seth Loe logged 2 at Mississinewa Reservoir, Miami, on 11 Oct.

Rose-breasted Grosbeak - Brad Bumgardner logged the high count of 9 at Beverly Shores, Porter, on 22 Sept. Delano Arvin had 1 at his Tippecanoe County feeders from 22 to 28 Nov, for Indiana's fifth latest fall record.

Blue Grosbeak - Vern Wilkins reported 1 at Goose Pond FWA, Greene, on 19 Oct, the state's second latest record. John Meredig photographed 1 on 11 Oct at the Sommerville Mines, Gibson, tied Indiana's 3rd latest record.



**Yellow-billed Cuckoo at McCloud Nature Park, Hendricks Co. on June 9, 2016 by Mike Jones.**



**Molting LeConte's Sparrow photographed by Shari McCullough at "The Burn" in Montgomery County on 19 October 2017.**



Bobolink - High count of 300 at Goose Pond FWA, Greene, on 26 Sept by Jim & Susan Hengeveld and Olmo Cornelis.

Eastern Meadowlark: Dave Schwartz tallied a high count of 53 on his Elkhart County farm on 14 Oct.

Rusty Blackbird - Matt Beatty saw a flock of 140 in Beverly Shores, Porter, on 17 Nov. Lindsay Grossman estimated 150 in St. Joseph County on 11 Nov.

Yellow-headed Blackbird - On 10 Sept, Carolyn Marsh observed 1 at the 129<sup>th</sup> St Mitigation Wetland, Lake. Amy Kearns and Gary Langell found 1 in Montgomery, Daviess, on 2 Nov. This is a second county record.

Brewer's Blackbird- High count of 151 exceeding last year's 131 by Eric Michael, was reported on 16 Sept in St. Joseph County also by Eric Michael. This is Indiana's sixth largest.

Pine Grosbeak - Indiana's first fall record since 1997 was logged at Ogden Dunes, Porter, on 22 Nov by John Kendall. This record was accepted by the Indiana Bird Records Committee.

Red Crossbill – 1 at West Beach, Porter, on 3 Nov by Jeff McCoy. 1 at Ogden Dunes, Porter on 25 Nov by Ryan Sanderson.

Common Redpoll - John Kendall observed a singleton twice at Ogden Dunes, Porter, on 15 and 22 Nov.

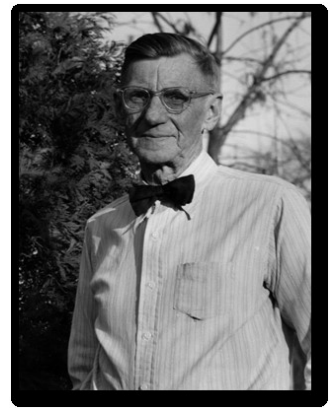
Pine Siskin – High count of 12 on 13 Oct at Atterbury FWA, Johnson, by Barbara Otte. Latest seen on 26 Nov was 1 in Newton County by Doug Gerbracht. Total reported for the state was 32 which was quite low.



## The Life and Writings of Donald H. Boyd, Part II

By Jerry Thomas Boyd  
Chesterton, IN 46304

*\*Editor's Note- The following is a continuation of the historic writings of Donald H. Boyd as presented in the last issue. His grandson, Jerry Thomas Boyd has transcribed many of his early nature writings for presentation here.*



*Don H. Boyd*

### The Great Northern Diver- D.H. Boyd

A long, hard row up the swift current of a small stream, which empties into the Kankakee River, brought me into one of the beautiful Northern Indiana Lakes, with its wooded banks and bluffs. From the top of a neighboring ice elevator a good view of the surrounding country can be had as well as the rugged outlines of the lake itself.

This lake is a favorite feeding place of the Great Northern Diver while the surrounding marshes abound in nooks and tangles, well-fitted for its nesting habits. The lake covers about one hundred acres and has a maximum depth of forty feet. It is connected by a short channel to another body of water of like breadth and depth. Both lakes abound in all the kinds of fish and mollusks known to the rivers and lakes of Northern Indiana.

One early spring morning, from the top of the elevator, I watched several of these matchless divers at their various stunts and antics. They had very likely just arrived as a few days before the ice had disappeared and the wind was still piercing cold. My arrival had evidently disturbed them in their diligent quest for food, as they gathered on the upper corner of the lake nearly opposite me where the water was shallow and thus not good feeding ground for the loon whose haunts are measured by the fathom. I had not been seated in my observation tower, the top of the elevator, very long before one of the loons bobbed up at the foot of the slides. He was followed by two others, both appearing at short intervals apart. The three swam all the way, nearly the breadth of the lake, under water, a distance of nearly one-fourth mile.

This ability to remain under water so long, without breathing and at the same time to expend so much energy swimming, is remarkable indeed. Whether or no the loon uses its wings to assist in propelling itself under water, as some of its near relatives, like the puffins, auks and penguins, I do not know. But even though the wings are not used, the broad, webbed feet, set almost at the extremity of the body, are no doubt fully adequate to accomplish the task.

I amused myself in noting the time spent by one of the loons above and below the surface. The following results of my observations proved very interesting to me:

1. - above 17 seconds  
2. - above 10 seconds  
3. - above 18 seconds  
4. - above 17 seconds  
Total 62 seconds  
Average 15.5 seconds

below 58 seconds  
below 50 seconds  
below 47 seconds  
below 48 seconds  
Total 203 seconds  
Average 50.5 seconds

I believe I am safe in saying that the average man cannot hold his breath over 45 seconds while sitting quietly at ease with no involuntary muscular energy being expended. Fifty seconds without breathing and at the same time propelling fifteen pounds through water at nearly the rate of the average passenger train, seems incredible. However when it is considered that the food of the loon consists almost entirely of fish which it catches alive, it will be recognized that its agility and swiftness must, to a certain extent, compare with the finny tribe. Were the loon compelled, it could no doubt stay under water much longer. The results, which I have given, only tell of its natural fishing expeditions or journeys from point to point beneath the surface.

That the loon is proud of his swimming powers on the water's surface, there is little doubt. He takes great gusto in showing off before others of his kind. He will rush across the water towards an opponent at a rate of speed little less than that of a torpedo, only to stop within a foot of him sending a shower of spray high in the air. At other times he will actually stand upon the water for a few seconds, uttering his alarm cry - "ker-l-e-e!", the last syllable he fairly shrieks. Sometimes he cries in a heartrending tone, like the shrill neighing of a horse. If he is satisfied with himself he utters a low, guttural laugh, in which his companions join. Whenever he comes up from a deep, successful dive, he says, "toot", which means if the dive was a long deep one, "what do you think of that?" or if a very successful one, "a big perch that time." I have heard the Pied-billed Grebes utter the same sound when they come to the surface after a dive, and with them I always interpreted it as "here I am."



**A Great Northern Diver, aka. Common Loon, migrates overhead in northwest Indiana in 2015. Photo by Brad Bumgardner.**

I once watched the maneuvers of a loon surrounded by no less than ten men in boats. Not one of them could get close enough to shoot him. Whenever he stuck his head above the surface for breath, half a dozen shots were fired at him, but he seemed to be gone before the report of the guns had ended. Then way outside of the surrounding enemy, with scarcely a ripple, his head would emerge. Several times he had ample opportunity to leave the water, but he seemed to enjoy the sport as much as the men. He appeared to take delight in "bobbing up" in their midst, or in fact to come up right alongside of a boat. At such times the man behind the gun was so startled that the loon had departed before the gun could be leveled. During all these maneuvers he never uttered a sound, which is unusual for a loon, but I have no doubt he was ever gurgling his sarcastic laugh to himself, for he had outwitted the opposing forces so easily.

A deep, narrow channel joined the two small lakes and, when the loon wished a change of feeding grounds, he would dive rather than fly the distance. One day a lad, by a clever dive of his own, caught a loon in his arms while it was passing through the channel. Then did the loon show his temper. Blow after blow he rained upon the bare breast and at the face of the boy who was soon glad to let him hop back into the water and pursue his way.

On land the loon makes a very comical figure, so very far back are his legs that he is most helpless. Sometimes, by bracing himself with his tail, he is able to sit upright, but should he attempt to move, he tumbles over with very little grace. I have read of the loon being able to run a short distance, but I have never seen one try it. On land he has always reminded me of a baby in its endeavors to walk, seeming to know what the legs are for, but not which muscles to put in action. Terra firma does not appeal to the loon; water is indeed his element.

**Donald H. Boyd's notebooks, which Ken Brock received from Russell Mumford, form the nucleus of the Donald H. Boyd collection in the Calumet Regional Archives located in the library of Indiana University Northwest Campus. Eventually paper copies of bird counts and correspondence from the archives of the Indiana Audubon Society (courtesy of Alan Bruner) will also be available in the Calumet Regional Archives along with what additional correspondence, poetry, notes, diaries, photographs and memorabilia is currently in the possession of Boyd's grandchildren.**

Other writings also include, "*Green Herons*," a nature observation written by Donald H. Boyd. This piece appears in the book, "*Of Prairie, Woods, & Water: Two Centuries of Chicago Nature Writing*", edited by Joel Greenberg, c. 2008 by University of Chicago Press.

## The World's Last Confirmed Wild Passenger Pigeon -from the Indiana Audubon Society Records Archive

By Alan Bruner, Marshall, IN  
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The life history of the Passenger Pigeon (*Ectopistes migratorius*) has been thoroughly covered in writings by various nature enthusiasts and authors with the result that virtually any Hoosier with a sense of the natural world is familiar at some level with the species and its road to extinction. One of the most famous birds in the world is Martha, the last Passenger Pigeon, which died in 1914 after years in captivity at the Cincinnati Zoo. But few realized the role the state of Indiana played in documenting the last confirmed record of a wild bird until quite recently.



**A male passenger pigeon specimen from the Indiana State Museum and Historic Sites Collection.**

In 2014, the entire country commemorated the hundredth anniversary of Martha's passing which provided the impetus for Joel Greenburg and a number of his colleagues to establish Project Passenger Pigeon a few years prior. Their goal was to use the centenary event as an educational event aimed at informing people about the Passenger Pigeon, its life history, and the role humans played in its demise. It was hoped that lessons could be learned from this and applied to current relationships between humans and nature such that other extinctions might not be repeated. This culminated in Joel's excellent book titled "*A Feathered River Across the Sky*". Though an extremely large amount of material had previously been published about this bird, Joel's extensive research of "all things Passenger Pigeon" yielded a wealth of information not published prior to 2014.

His research led to a re-examination of Indiana reports near the end of the 19<sup>th</sup> century. The result was the realization that the last confirmed wild Passenger Pigeon might be a specimen collected 3 April 1902 from Laurel, Indiana, in Franklin Co. Knowledge of this specimen was noted by Amos W. Butler (1902) as coming from Fletcher M. Noe who operated a pawn/taxidermy shop in Indianapolis. From him Butler learned that Charles Muchmore of Laurel, Indiana, had obtained a specimen that had been taken near there. Muchmore commented on this bird as follows:

*"The bird, which is a beautiful male, was taken by a young man named Crowell, near his home, about two and one-half miles southwest of this place. He reported that there were two. He heard the bird cooing and shot it and brought it to me, having concluded that it was something new. You can imagine how we almost took it away from him when he unrolled it out of a bloody old newspaper and began to inquire if we knew what it was. I was convinced that I saw a flock of five Passenger Pigeons one day in the spring of 1901, but had never said much about it as I only saw them flying and at a distance and it seemed rather improbable. I used to see them occasionally in Iowa about 1882-3, and although I was then very small, the specimen was not new to me, and I, of course, at once recognized the same."*

Joel believed that Butler had confidence in Muchmore's identification skills but thought confirmation of the record would require more. Ownership was not known to change and there was no indication that the specimen was placed in a collection where future examination might be possible. However, ten years later Butler (1912) mentions the specimen again noting:

*“The last verified record for this State is from Franklin County. Two birds were seen, and one was shot, near Laurel, April 3, 1902. The specimen taken was submitted to the writer for verification and was returned to Mr. C.K. Muchmore, the owner, at Laurel.”*

Although confirmation by Butler seemed adequate to verify the specimen's identity and existence at the time, Joel hoped there was “more to the story”. Foremost was the fate of the specimen – did it still exist and where was it? The answer hopefully could be found in the writings of Amos W. Butler. Joel contacted Don Gorney who said most of Butler's work was housed at the Lilly Library at Indiana University in Bloomington, Indiana. Joel, with Don's assistance, made the trip to Indiana University and spent a day going through many boxes of material pertaining primarily to Butler's social-welfare and prison work, but very little to actual notes on birds.

Gorney then learned that papers related to Butler's work on birds was in the possession of the Indiana Audubon Society and stored in Brook's Hall at Mary Gray Bird Sanctuary near Connersville. But they were not there! The Indiana Audubon Bird Report Archives (IBRA) is maintained by me at my Marshall residence in Parke Co. and upon discovering the material in the back room of Brook's Hall decided to take it home and incorporate it into the archives. This involved two large boxes filled to the brim with Butler's letters of correspondence, original drafts of articles, personal field notes, and assorted writings concerning Indiana birds (as well as more material related to his social-welfare and prison work).

So the focus shifted to west-central Indiana and Don contacted me to ask if I had found any information on the Muchmore specimen and/or if it was possible to come and examine the material themselves. I informed Don that I had not had time to examine and organize the material into any useful order and informed Don that there was a massive amount of material that was randomly piled in two large boxes. But I invited them to come to Marshall and together the three of us could pour through the boxes and hope for the best.

On the wintry day 4 December 2010, Joel and Don arrived at my house and the three of us dove into the mound of paperwork with high hopes. It was like looking for a needle in a haystack but surprisingly I came upon two letters by Charles Muchmore to Amos Butler and one letter from Butler to Muchmore referring to the Laurel Passenger Pigeon (Wild Pigeon) specimen. Eureka! This is what we were looking for! Excitedly Joel read the letters which answered the questions of the existence and location of the Laurel specimen – but the answers were not exactly what he had hoped for.

During his life, Amos W. Butler was constantly collecting information on Indiana bird records and specifically was assimilating material for a possible revision of his *Birds of Indiana* published in 1897. For this purpose he had mailed out a countless number of letters to “birders” throughout the state asking about specific bird species observed in their areas or about general groups of birds such as waders (herons and egrets). The latter was sent out as a form letter. Apparently a Mr. E. A. Schultze had received an inquiry from Butler about the Laurel specimen among other things, and perhaps Butler was trying to contact Muchmore via Mr. Schultze.

At any rate, Schultze was able to reach Muchmore who subsequently wrote a letter to Butler dated 30 August 1932 (See Figure 1). The portion of the letter pertaining to the “wild pigeon” specimen is as follows:

*“I am very sorry to report that the pigeon was destroyed some seventeen years ago, on this wise! I was taken with tubercular trouble and dropped everything and headed for the mountains. I was in Grant County at the time. Later I wrote to a friend to go to the store and get my specimens and take them home with him until I might be able to call for them. This he did, but unfortunately his wife promptly threw them into a woodshed attic and the winter rains beating thru the roof wrecked them all, so that months afterward when I inquired about them, they were gone. I shall always regret my failure to put this specimen in the state museum as you suggested, and as I had fully intended to do. I do not know that I*

The remainder of the letter addresses his records of wading birds.



MUCHMORE PHARMACY  
 TELEPHONE 80  
 LAUREL, INDIANA

ans  
 9-1-32  
 9-16-32

Passenger Pigeon  
 Great  
 Herons  
 Woodcock

August 30, 1932.

Mr Amos W. Butler  
 Indianapolis, Indiana.

Dear Sir:— Mr. E. A. Schultze has  
 been telling me about your inquiry re-  
 garding the wild pigeon that was taken  
 here in 1902.

In view of the fact that I have  
 been wanting to get in touch with you  
 to report some strange bird visitors  
 along the Whitewater, I am answering  
 your question, also.

I am very sorry to report  
 that the pigeon was destroyed some  
 17 years ago in this case. I was  
 taken with tubercular trouble and  
 dropped everything and headed for the  
 mountains. I was in Grant county  
 at the time. Later I wrote to a friend  
 to go to the store and get my specimens  
 and take them home with him until  
 I might be able to call for them.



MUCHMORE PHARMACY  
 TELEPHONE 80  
 LAUREL, INDIANA

This he did, but unfortunately his  
 wife promptly threw them into a  
 wood shed attic and the winter rains  
 beating thru the roof wrecked them  
 all, so that months afterwards when  
 I inquired about them, they were gone.  
 I shall always regret my failure to put  
 this specimen in the state museum  
 as you suggested, and as I had  
 fully intended to do. I do not know  
 that I ever told you that there were two  
 of these birds seen the day this one  
 was taken but the other one was  
 never taken or seen as far as I  
 have been able to ascertain.

Now in regard to the bird visitors:  
 Aug. 22, 1930 about a dozen white  
 winged birds appeared along the river  
 here. There were two considerably



3

MUCHMORE PHARMACY  
TELEPHONE 80  
LAUREL, INDIANA

larger than the others. One of them was shot and brought to me. It answers to the following description and measurements:

Length	22.50	
Wing	15.25	
Bill	5.00	
Tail	7.00	Egret

Sex: Female. Plumage all white. Legs black. Feet black. Bill yellow. Eyes and lores yellow.

Is this an Egret? OK

The other birds from their description must have been white herons.

Each summer since I hear of a few being seen.

I would like to secure a specimen but as I have no permit either as a taxidermist or collector have hesitated to do so.

4

MUCHMORE PHARMACY  
TELEPHONE 80  
LAUREL, INDIANA

We have returned here to live after a long absence and if I can be of any assistance along these lines that we are both interested in I will be glad to do so.

The woodcock have returned here, and are fairly plentiful. I had rarely seen one for some years before I left here 23 years ago.

Quail are more plentiful. Wild ducks almost an unknown visitor.

Last fall an unusual amount of wild geese passed over, but few ducks. I have wondered if this was accounted for by the fact that the geese nested further north while the ducks were affected by the drought in lower part of Canada and in the States.

Hoping to hear from you at your leisure, I remain  
yours respectfully  
Charles K. Muchmore

**Figure 1. Original letter dated 30 August 1932 from Charles Muchmore to Amos W. Butler concerning the Passenger Pigeon specimen from Laurel, Indiana.**

Butler wanted to insure that the specimen mentioned was indeed the one in Muchmore's possession that he had personally examined in 1902. He was researching information on the last wild Passenger Pigeon in Indiana and wanted to know more details. Butler apparently wrote to Muchmore about this matter but did not receive an answer, prompting a second letter dated 16 September 1932 which reads as follows:

*"I am under the impression that I replied to your letter of Aug. 30. Did you receive it? I am desirous of an early reply. The question has been raised as to the record of the last Wild Pigeon taken in Indiana – your record. I hope I advised you that I needed to know whether I saw the specimen. Did F. M. Noe see it? Who else? Who mounted it? Also tell me any other facts you have not told me about the specimen. "It is a gratification to know of your continued interest in birds. That you will keep records and make reports of your observations. Shall be pleased to have them and to supply you with blanks for reporting whenever you need them. Do you have any? "An addressed postal card is enclosed for a reply which will be appreciated."*

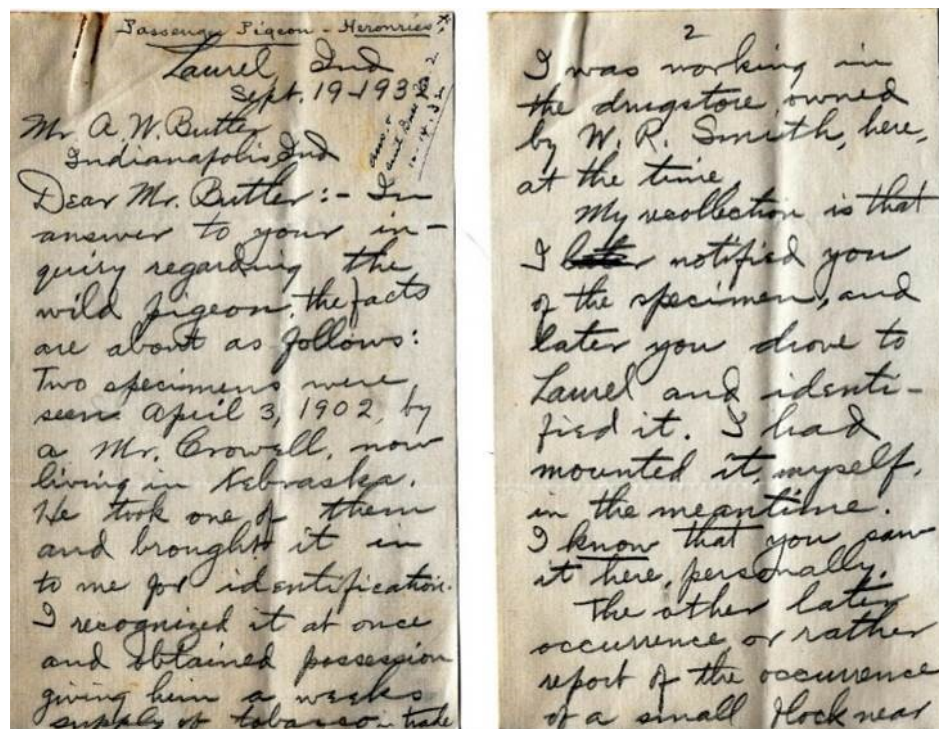
Muchmore promptly responded with a letter dated 19 September 1932 (See Figure 2) that answered Butler's inquiries. The portion related to the specimen reads as follows:

*"In answer to your inquiry regarding the wild pigeon, the facts are about as follows: Two specimens were seen April 2, 1902, by a Mr. Crowell, now living in Nebraska. He took one of them and brought it in to me for identification. I recognized it at once and obtained possession giving him a week's supply of tobacco (trade). I was working in the drugstore owned by W.R. Smith, here, at the time. My recollection is that I notified you of the specimen, and later you drove to Laurel and identified it. I had mounted it, myself, in the meantime. I know that you saw it here, personally. The other later occurrence or rather report of the occurrence of a small flock near here, I have always regarded as a mistake, as I did a lot of investigating and inquiring immediately, and failed to get any information that would indicate that the birds were really the genuine passenger pigeon."*

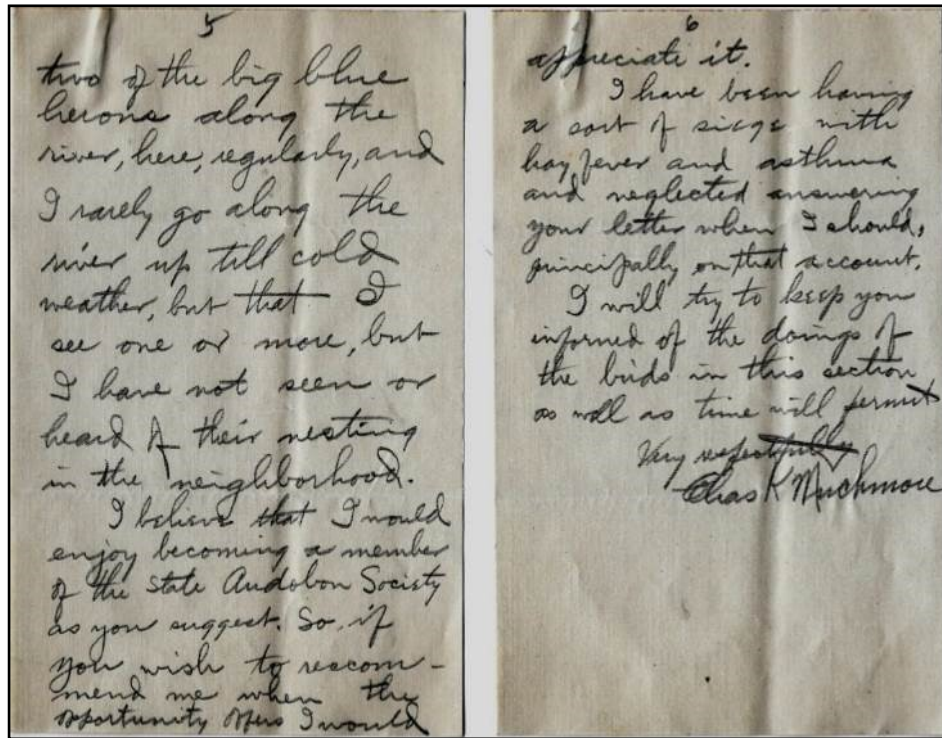
The remainder of the letter addressed some of Butler's other works and heron reports.

Even though making a few choice comments about "wives," Joel was satisfied that the Laurel specimen was verified to have existed and that its fate was known. The specimen purchased with a supply of tobacco was indeed the last known verified record of a Passenger Pigeon in the wild in the entire world.

As a result of Joel's research and the importance of Indiana to the species for both nesting and migration, the Indiana Audubon Society has led efforts, in partnership with the Indiana State Museum and Indiana Division of Nature Preserves, to erect a historical marker to the Passenger Pigeon. This marker is to be erected in Metamora in Franklin Co., Indiana - the same county where the Laurel specimen was taken and near Brookville, the birthplace of Amos W. Butler.







**Figure 2. Original letter dated 19 September 1932 from Charles Muchmore to Amos W. Butler concerning the Passenger Pigeon specimen from Laurel, Indiana.**

It was many years after 3 April 1902 that man was willing to concede the end of the Passenger Pigeon in Indiana (or anywhere else). General to specific reports continued to crop up in Indiana, none of which were confirmed via physical evidence and most considered unreliable sightings. In fact, some reports came from an observer known to market Mourning Dove eggs as Passenger Pigeon eggs. Post Laurel sightings include the following:

**1902**, fall – (small flock) Laurel, Franklin Co. Charles Muchmore (Butler 1902).

**1905**, spring – (adult with young) Haymond, Franklin Co. Joseph F. Honecker (Butler 1907).

**1906**, 18 May – (six adults, one nest with two young) Oak Forest, Franklin Co. Joseph F. Honecker. Honecker says “On May 18 1906, I had the good fortune to find three nests of the Wild Pigeon about one half mile east of Oak Forest, Franklin County, Indiana. The nests were about eight to fifteen feet from the ground in a small elm tree. Two of them contained two eggs each and one contained two young only a few days old. I saw the six adult birds at one time, and observed them until the young were grown. They were last seen together in a flock, July 13.” (Butler 1907).

**1906**, 13 July – (several seen and reported nesting) near Oak Forest, Franklin Co. Joseph F. Honecker (Butler 1912).

**1908**, 15-25 April – (20) Wayne Co. Spring 1908 personal field notes of Walter S. Ratliff. (IBRA)

**1909**, 2-4 April – (15) Richmond, Wayne Co. Spring 1909 personal field notes of Walter S. Ratliff. (IBRA).

**1909**, 10 September – Brookville, Franklin Co. 1909-1910 personal field notes of Joseph F. Honecker (IBRA).

**1909**, 12 September – (2) Brookville, Franklin Co. Seen by brother of Joseph F. Honecker. 1909-1910 field notes of Joseph F. Honecker (IBRA).

**1910**, 13 April – (12) Fort Wayne, Allen Co. Frank Brown. (Esten 1935).

**1910**, 12 November – Mt. Carmel, Franklin Co. Joseph F. Honecker. (Reifel 1915).

**1912**, spring – Bicknell, Knox Co. Walter S. Chansler. W. S. Chansler letter of 17 March 1936 to Amos W. Butler (IBRA).

**1920's**, late – (flock of c. 15) between Indianapolis and Kokomo, Indiana. Dr. Samuel R. Landis. Indiana Audubon Bulletin 1930, p. 64..

**1931**, Memorial Day – (a flock) Turkey Run State Park, Parke Co. C.E. Scheuring. Frank B. Wade letter of 26 June 1931 to Sidney Esten (IBRA).

Suffice it to say that the Passenger Pigeon did not last as a wild bird much beyond the 1902 specimen. The desire to prove the species still existed was very strong and very important. But the realization of its sad condition and feeling of loss is reflected in Walter S. Ratliff's note on the 2-3 April 1909 sighting:

*“This flock of Passenger Pigeons is probably the one that passed over my farm every spring. It numbered 15, and I, with Levi M. Jones, who also counted, and being a man of 60 years of age, and having lived on his father's farm many years, which was near the noted Pigeon Roost, had a good opportunity to view them. They remained near my farm for three days, and, although I wanted to secure a specimen, I could not find heart to shoot into the flock.”*

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# GOOSE POND FISH AND WILDLIFE AREA SHOREBIRD REPORT 2016

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## INTRODUCTION

Goose Pond Fish and Wildlife Area (GPFWA) is an 8,933 acre property south of Linton, Indiana that is owned and managed by the Indiana Division of Fish and Wildlife. Located near the migratory pathways of the Wabash and White Rivers, GPFWA is an important migratory bird stopover site. A total of 35 species of shorebird have been recorded on the property, including the federally endangered piping plover and eight species that Indiana lists as in greatest need of conservation (Kearns 2016).



**American Golden Plover.** Photo taken by Ryan Sanderson.

The 2009-2014 Management Plan for GPFWA pledges to provide habitat for migratory shorebirds, and calls for monitoring as a means to measure the effectiveness of management practices (Feaster 2009). Since 2007, shorebird survey and monitoring results have provided valuable knowledge for the adaptive management of shorebird habitat at GPFWA (*pers. comm.* Lee Sterrenburg 2017). In 2015, surveyors documented 13,192 individual shorebirds of 30 different species, including two State Endangered species and seven species of Special Concern (Kearns 2016). This distinguishes GPFWA as a significant stopover site for shorebirds in Indiana. Furthermore, the state record high count for white-rumped sandpipers was more than doubled on two dates in the fall of 2015, when 126 and 108 individuals were counted. Large numbers of nesting black-necked stilts (122 adults in one unit on one day) were also observed in spring that year (Kearns 2016). Such evidence suggests that GPFWA provides essential habitat throughout the year for not only migratory shorebirds, but for breeding individuals as well.

Shorebird surveys continued at GPFWA in 2016. I report the results of these ongoing monitoring efforts to examine how shorebirds responded to various habitat management practices, and I compare these results to those found during 2015. The intent of this report is to help inform management actions for the next shorebird migration season, to highlight the importance of shorebird habitat management and investment, and to stimulate interest in shorebird conservation among partners.

## METHODS

A group of volunteers, skilled in bird identification and scientific data collection, surveyed the property for shorebirds following the International Shorebird Survey (ISS) and the Program for Regional and International Shorebird Monitoring (PRISM) standards (Manomet 2010). Survey efforts were field assisted and coordinated by Wildlife Diversity staff at the Indiana Department of Natural Resources. Shorebird observations and surveyor effort were collected in accordance with the methods outlined in Kearns (2016). In 2016, surveys were conducted in the following 14 units: Beehunter 2 (BH2), Beehunter 3 (BH3), Field B, Field C, Field E, Goose Pond 1 (GP1),

Goose Pond 3 (GP3), Goose Pond 5 North (GP5N), Goose Pond 5 South (GP5S), Goose Pond 8 (GP8), Goose Pond 10 North (GP10N), Goose Pond 11 South (GP11S), Goose Pond 13 (GP13), and Main Pool East (MPE) (*Figure 1*). The spring survey was conducted between 16 March and 10 June, and the fall survey was conducted between 11 July and 15 November.

## RESULTS

### Survey Effort

Approximately 142 hours were logged over 14 survey periods for an average of 10.1 hours of effort per survey period. Effort was higher in spring with an average of 12.5 hours of effort over six survey periods versus an average of 8.4 hours over eight survey periods during the longer fall migration season (*Figures 2 and 3*).

### Total Count

Surveyors recorded 12,307 shorebirds of 26 different species at GPFWA during the 2016 spring and fall survey periods. With 2,058 individuals recorded, American golden-plovers were the most numerous, representing 16.7% of the total number of shorebirds surveyed. Over 1,000 individuals of three other species were recorded including lesser yellowlegs (1,602; 13.1%), killdeer (1,263; 10.3%), and pectoral sandpiper (1,256; 10.2%). Together, these four species represented 50.1% of all observed individuals (*Figure 4*). The remaining individuals belonged to 22 species, which included species of avocet, dowitcher, godwit, phalarope, plover, sandpiper, snipe, stilt, and turnstone (*Figure 4*).

### Spring Survey

Twenty-three shorebird species were found during the spring survey, representing approximately 73% of the total individuals recorded during the year. In spring, five species together comprised greater than 60% of shorebirds observed: American golden-plover (22.8%), lesser yellowlegs (13.6%), pectoral sandpiper (11.8%), dunlin (10.5%), and semipalmated plover (7.8%) (*Figure 5*).

Spring season shorebirds showed a very strong preference for two of the nine drawn down units, with approximately 81.7% of all observed individuals recorded in MPE and GP8 (*Figure 6*). Spring shorebird numbers peaked during the 16-30 April survey period, with 3,201 (approximately 35%) of individuals observed during that timeframe (*Figure 2*).

### Fall Survey

Twenty-one shorebird species were found during the fall survey, representing approximately 27% of the total individuals recorded during the year. Killdeer comprised nearly 30% of fall season shorebirds, whereas least sandpiper (17.5%) and lesser yellowlegs (11.4%) were the second and third most numerous, respectively (*Figure 7*).

Nearly 75% of fall season shorebirds were recorded in GP10N (38.6%), BH2 (23.5%) and MPE (12.4%) (*Figure 8*). Shorebird numbers peaked in mid to late July, with about 30% of individuals recorded during that survey period (*Figure 3*).

## DISCUSSION

### Species Highlights of the 2016 GPFWA Shorebird Survey

GPFWA is a critical stopover site for thousands of migratory shorebirds each year, including those in greatest need of conservation. In 2016, shorebird surveyors observed six shorebird species listed in Indiana as Special Concern (American golden-plover, solitary sandpiper, greater yellowlegs, ruddy turnstone, short-billed dowitcher, and Wilson's phalarope), while ten recorded species are listed as high conservation concern on the "Watch List" of the U.S. Shorebird Conservation Plan Partnership (2015) (Indiana Division of Fish and Wildlife 2016). Five of the "Watch List" species are listed as "Birds of Conservation Concern" by the U.S. Fish and Wildlife Service (2008), and three are species of greatest conservation need in Indiana (Indiana Division of Fish and Wildlife 2016). In addition, the Upper Mississippi Valley and Great Lakes Region is considered of high importance for most of the "Watch List" species, and several of these species have high regional and national conservation priority (de Szalay 2013) (*Table 1*).

A record number of American golden-plovers were observed at GPFWA in April 2016. A total of 2,058 individuals were counted in spring, while none were found in the fall. The former property record high count (559 by Mike Clarke 14 April 2008) was topped twice, once in MPE on 20 April (622) and again in MPE on 24 April (600) (*pers. comm.* Ken Brock 2016). High counts of American golden-plovers were also made in GP8 on 5 April (514) and 16 April (174). For comparison, the 2015 spring survey only documented 33 American golden-plovers (Kearns 2016).

Adult shorebirds migrate south earlier in fall than juveniles, and indeed most adult shorebirds have migrated through GPFWA well ahead of the fall equinox (*Table 2*). On 12 July, three new property records were set when five adult western sandpipers were observed and photographed in MPE. This event represented a new property high count (the former high count was two on two occasions), the first property record of western sandpiper in the month of July, and the first time adults of this species have been observed at GPFWA during fall migration (*pers. comm.* Lee Sterrenburg 2016; eBird 2017). The five were also the largest count of western sandpipers recorded in Indiana since 1997 (*pers. comm.* Ken Brock 2016).

Long-billed dowitchers are considered uncommon in the fall in Indiana, although fair numbers are found at GPFWA annually (Brock 2006; eBird 2017). For example, surveyors reported a total of 67 long-billed dowitchers at GPFWA during the fall in 2015 (Kearns 2016). This fall however, 206 long-billed dowitchers were tallied, including a new state record of 170 on 19 October, which is over four times the former record for Indiana (40 at Lake Lemon 22 October 2000 by Jim and Susan Hengeveld) (*pers. comm.* Ken Brock 2016; eBird 2017).

The diversity of shorebird species observed during the 2016 survey at GPFWA was remarkable. Twenty-six of the 36 (72%) regularly occurring (annual or near annual) shorebird species in the state were recorded. No other public property in Indiana besides GPFWA has documented this many regularly occurring shorebird species in a single year (*pers. comm.* Ken Brock 2015).

### **Targeted Management Species of the 2016 GPFWA Shorebird Survey**

The GPFWA 2009-2014 Management Plan focuses on managing habitat for 10 shorebird species (Feaster 2009). *Table 2* provides the target species, their habitat preferences, and their respective spring and fall migration windows (Feaster 2009). Also included are their peak migration dates for GPFWA (*pers. comm.* Ken Brock 2016), and the number of times the species were recorded during the 2016 spring and fall shorebird survey.

The 2010 GPFWA Bird Conservation Plan provides specific information, including target one-day high counts for four migratory shorebird species: greater yellowlegs, least sandpiper, pectoral sandpiper, and Wilson's snipe (Brittain et al. 2010). *Table 3* compares the target one-



day high counts for these species with the observed one-day high counts made during the 2016 shorebird survey. One-day high counts for greater yellowlegs fell short of the Bird Conservation Plan projected goals while least sandpiper, pectoral sandpiper, and Wilson's snipe counts met or exceeded projected goals (*Table 3*).

Property counts for greater yellowlegs and pectoral sandpiper were elevated in the past perhaps because the wetland was newly completed and lacked established populations of aggressive native and invasive vegetation. High counts of these species, recorded around the time of GPFWA's inception, could be repeated, especially if early succession is maintained through future draining, discing or plowing. Specifically, conducting these management practices in Fields B, C, and E so that ideal habitat is available from early to mid-April 2017 could result in meeting or exceeding the one-day high count goals for greater yellowlegs and pectoral sandpiper.

### **Variation of Counts across Units of the 2016 GPFWA Shorebird Survey**

The spring survey shows a dramatic shorebird preference for MPE and GP8 (*Figure 6*). These two spring drawn down units and another spring unit (GP10N) continued to attract shorebirds into fall (*Figure 8*). Southbound adult shorebirds stopping over at GPFWA in July were exclusively found in spring drawn down units, as fall units had not yet been drawn down. As the fall migration season progressed, the majority of shorebirds were found in two units, GP10N and BH2 (*Figure 8*).

Why shorebirds prefer some units over others is an interesting question that needs further research. Possible components are the availability of benthic macroinvertebrate prey, water depth, surrounding vegetation, and disturbance (*see Appendix, Table 2*). Shorebird habitat data have not yet been gathered in a systematic way during surveys. Prey density and shorebird diet studies have also not been conducted to quantify the value of GPFWA's shorebird habitat. In turn, these topics provide fertile ground for future research. Results from future shorebird surveys coupled with habitat quality data, will add to our knowledge about the way shorebirds use the property and help us understand why some units are preferred over others, resulting in improved management techniques that benefit migratory shorebirds.

### **Shorebird Migration Phenology and Surveyor Effort of the 2016 GPFWA Shorebird Survey**

The number of shorebirds recorded during each survey period is variable due to the phenology of bird migration, weather patterns, habitat conditions, and surveyor effort. Comparisons of survey results by survey period will become more useful over time, especially for determining migration trends or comparing survey results between years. In 2016, the numbers of spring migrants peaked during the early April survey period, and fall numbers peaked in mid-late July (*Figures 2 and 3*). In future years, the fall peak can be expected in September when large numbers of juvenile shorebirds are migrating through.

Survey effort was tracked in miles and hours, but only hours are shared in this report for the sake of simplicity and because hours give a better representation of stationary survey efforts. Spring survey results show a positive correlation between surveyor effort hours and number of shorebirds counted ( $r = 0.53$ ; Microsoft Excel 2013) while fall survey results also show a positive correlation ( $r = 0.44$ ; Microsoft Excel 2013) (*Figures 2 and 3*). This is expected, because more time surveying for shorebirds typically results in more shorebirds counted. Also, the shorebird surveyors are knowledgeable in shorebird migration phenology and often planned survey efforts to coincide with expected peaks in bird numbers. Weather plays a role in the

number of migratory shorebirds on the property at any one time and surveyors sometimes predicted large flights based upon weather patterns. In addition, surveyor preference was given to units hosting large numbers of shorebirds, therefore units were not surveyed evenly.

### **Comparison with the 2015 GPFWA Shorebird Survey**

Effort hours increased slightly in 2016 (142 vs. 136 or +4.4%) because two survey periods (March 16-31 and November 1-15) were added this year to better capture early and late shorebird migrants (particularly dunlin and Wilson's snipe). The increase in effort happened in spring (75.25 vs. 66.25 or +13.6%), as fall effort hours showed a slight decrease in 2016 (67 vs. 69.5 or -0.04%) despite the additional survey period in November (Kearns 2016).

In 2016, 885 fewer individuals were recorded compared to the previous year (12,307 vs. 13,192 or -6.7%) (*Figure 9*). This decrease occurred despite the large flocks of American golden-plovers on multiple dates in spring, which resulted in a significant increase in individuals counted in spring of 2016 compared to spring of 2015 (9,035 vs. 5,939 or +52.1%) (*Figures 9 and 10*). There was a dramatic decrease in individuals recorded in fall of 2016 (3,272 vs. 7,253 or -54.9%) (*Figures 9 and 11*). Typically, fall shorebird numbers at GPFWA peak in September, when large numbers of juvenile shorebirds stage on the property before continuing their southward migration. However in August 2016, high amounts of precipitation filled wetland units and nearby ditches, preventing water drawdowns needed to expose foraging habitat for shorebirds in August and September. August 2016 was the 2<sup>nd</sup> wettest August on record in Indiana, with statewide precipitation averaging 2.64" above normal (170% of normal in southern Indiana) (Indiana State Climate Office 2016). High water resulted in surveyors recording fewer shorebirds per hour, and less time was spent surveying since there were fewer shorebirds to count (*Figures 11 and 3*).

A total of thirty-two shorebird species were found between 2015 and 2016. Twenty-four of those species were observed both years. Two shorebird species were recorded exclusively in 2016, whereas six species were found only in 2015, resulting in a lower species total in 2016 (26 vs. 30) (*Figure 12*). The two species found only in 2016 were Hudsonian godwit and western sandpiper. The six species found exclusively in 2015 were American woodcock, buff-breasted sandpiper, piping plover, red-necked phalarope, sanderling, and upland sandpiper (*Figure 12*). Of the six species not observed in 2016, American woodcock is found on the property at upland sites each year. None were observed by surveyors inside the drawn down units in 2016 because this species prefers shrubby, upland habitats over wetlands (*see Appendix, Table 2*). Sanderlings occur almost annually at GPFWA, being reported eight of the last ten years, and some were found by a surveyor in MPE on one date in 2016, but that checklist was mistakenly not submitted to ISS or the coordinator (eBird 2017). Buff-breasted sandpipers and red-necked phalaropes were recorded at GPFWA in at least five of the last ten years, but their migration peaks in August through early September, or precisely when high water inundated wetland units in 2016 (eBird 2017). Both piping plover and upland sandpiper are rarely found at GPFWA and are not expected in any given year. Of the two species found exclusively this year, Hudsonian godwits have been recorded at GPFWA four of the last 10 years, and western sandpipers, seven of the last 10 years (eBird 2017).

### **Conclusion**

More than 25,000 shorebirds of 32 different species have been documented at GPFWA in only two years. Record numbers of American golden-plovers, semipalmated plovers, white-rumped

sandpipers, western sandpipers, and long-billed dowitchers were reported. In light of the remarkable shorebird numbers and diversity during spring and fall migration, it is clear that Goose Pond FWA provides critical stopover habitat for migratory shorebirds in Indiana. Surveys should be continued in order to thoroughly understand shorebird trends at GPFWA and to assist in the development of appropriate management strategies that enhance shorebird use of the property. However, research linking habitat variables, macroinvertebrate prey density, and shorebird diversity is needed.

Monitoring efforts could not have been achieved without the participation of property managers to implement the necessary management actions for these birds, and the effort of shorebird surveyors to gather data on the effectiveness of these actions. Because managing habitat for shorebirds is complex, it is vital that property managers and surveyors continue to collaborate to ensure stopover habitat at GPFWA in future years. This shorebird report is an integral part of the adaptive management of migratory shorebird habitat and will be made available to property staff to perform future management actions as they see fit. It is also my hope that this report stimulates interest in shorebird conservation and research among partners, including future habitat acquisition and management for shorebirds.

### **Acknowledgments**

Goose Pond Fish and Wildlife Area was acquired and restored through the hard work of many individuals and organizations. Thanks to their dedication, millions of birds have a home through all or part of the year. Thank you to Lee Sterrenburg for providing the inspiration for Wildlife Diversity involvement in this monitoring project. Tremendous thanks to shorebird surveyors Jim Brown, Jerry Downs, Don Gorney, Gary Langell, Kirk Roth, Lee Sterrenburg, and Vern Wilkins for all their effort counting shorebirds and especially for entering their data online and sharing it with me. Thanks also to Property Manager Travis Stoelting for his guidance, cooperation and assistance in survey efforts. Bird record experts Ken Brock and Lee Sterrenburg greatly assisted in putting results into a historical context. Thank you to Allisyn Gillet for editing this manuscript, and to John Castrale, Don Gorney, and Lee Sterrenburg for their review and comments. Wildlife Diversity efforts were funded by State Wildlife Grants and the Indiana Nongame Fund through donations to the state income tax checkoff.

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FIGURES AND TABLES

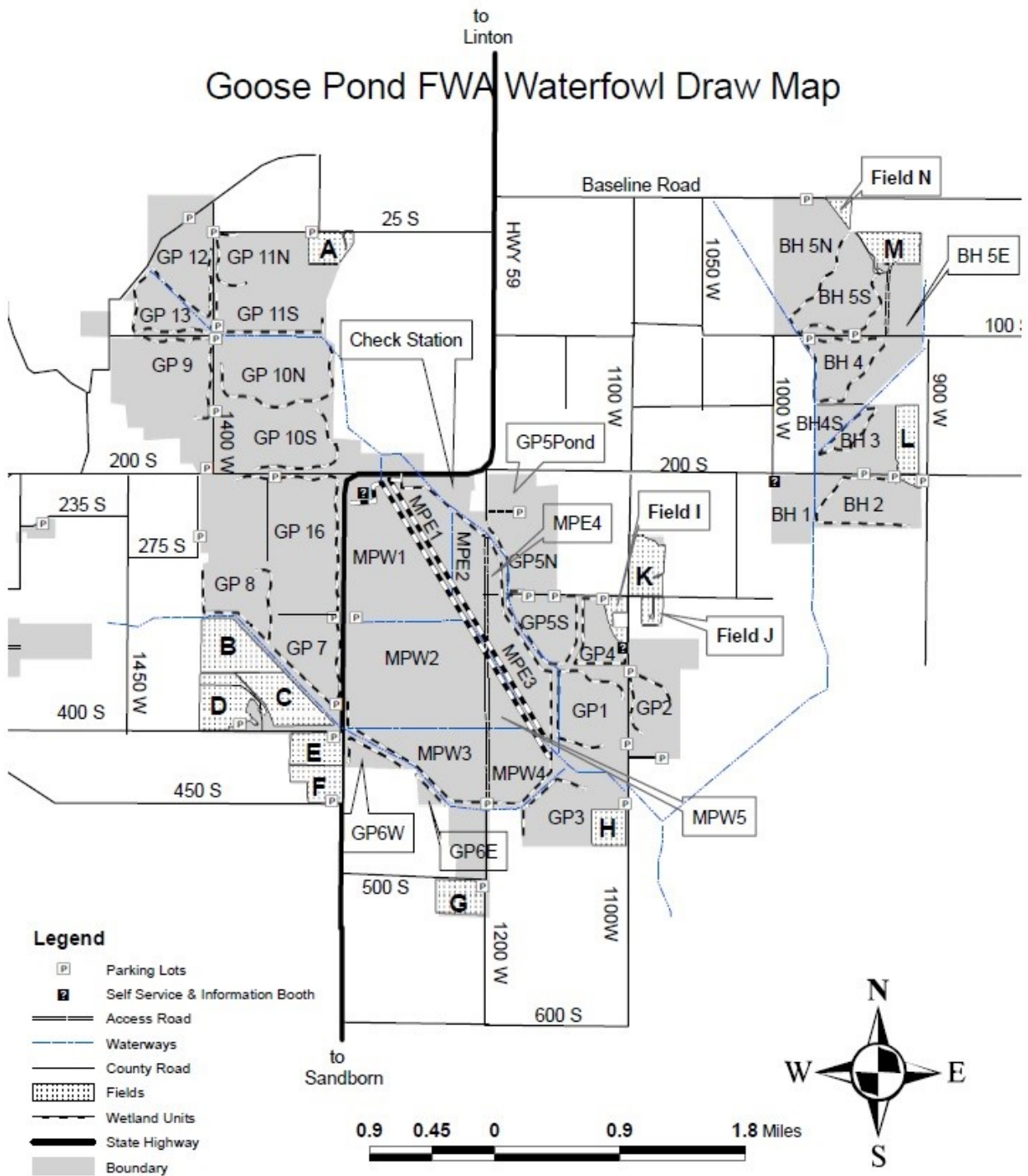


Figure 1. Locations of shorebird survey units throughout Goose Pond Fish and Wildlife Area.

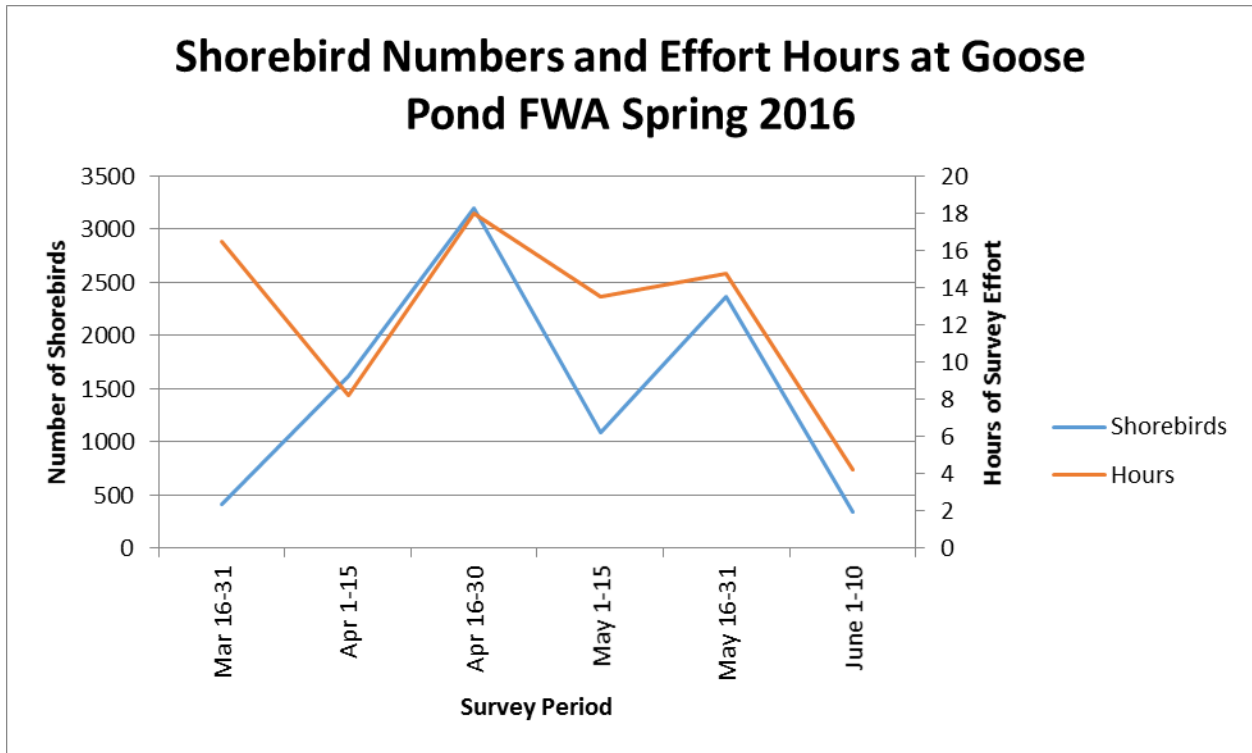


Figure 2. Numbers of shorebirds detected and survey effort hours during Spring 2016 by survey period.

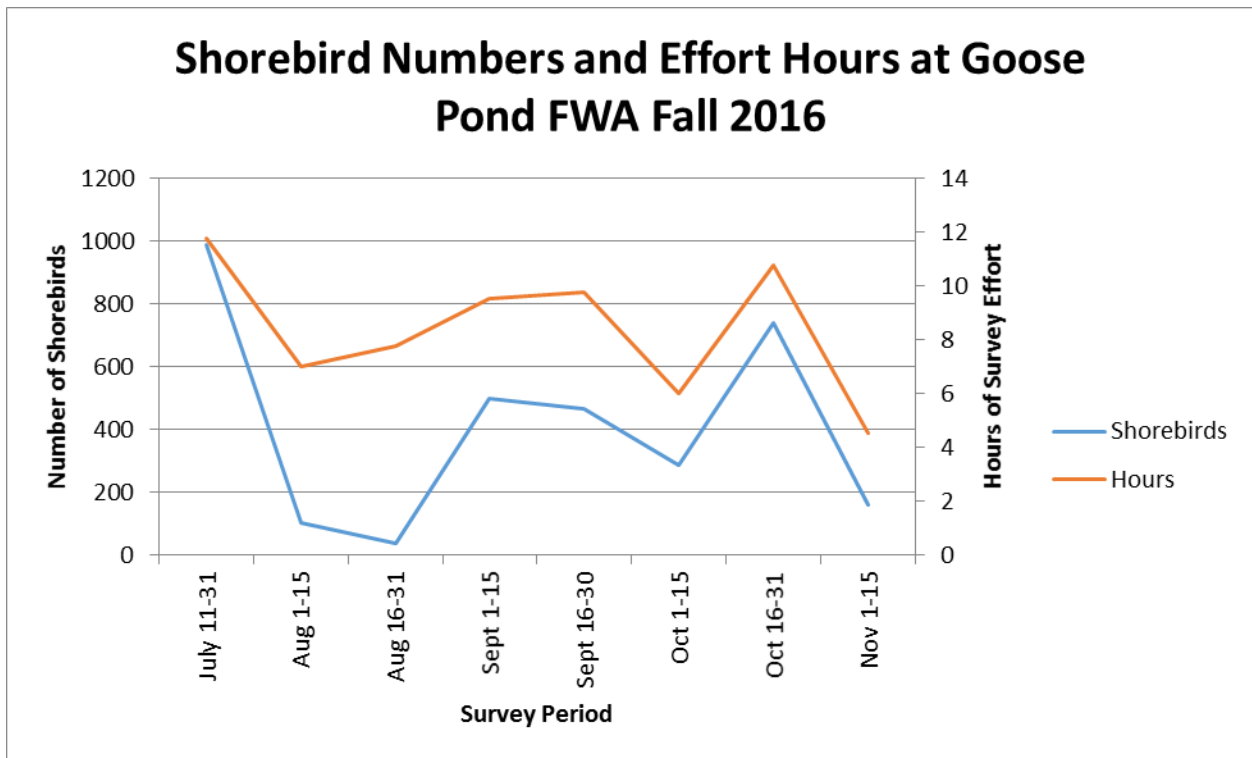


Figure 3. Numbers of shorebirds detected and survey effort hours during Fall 2016 by survey period.

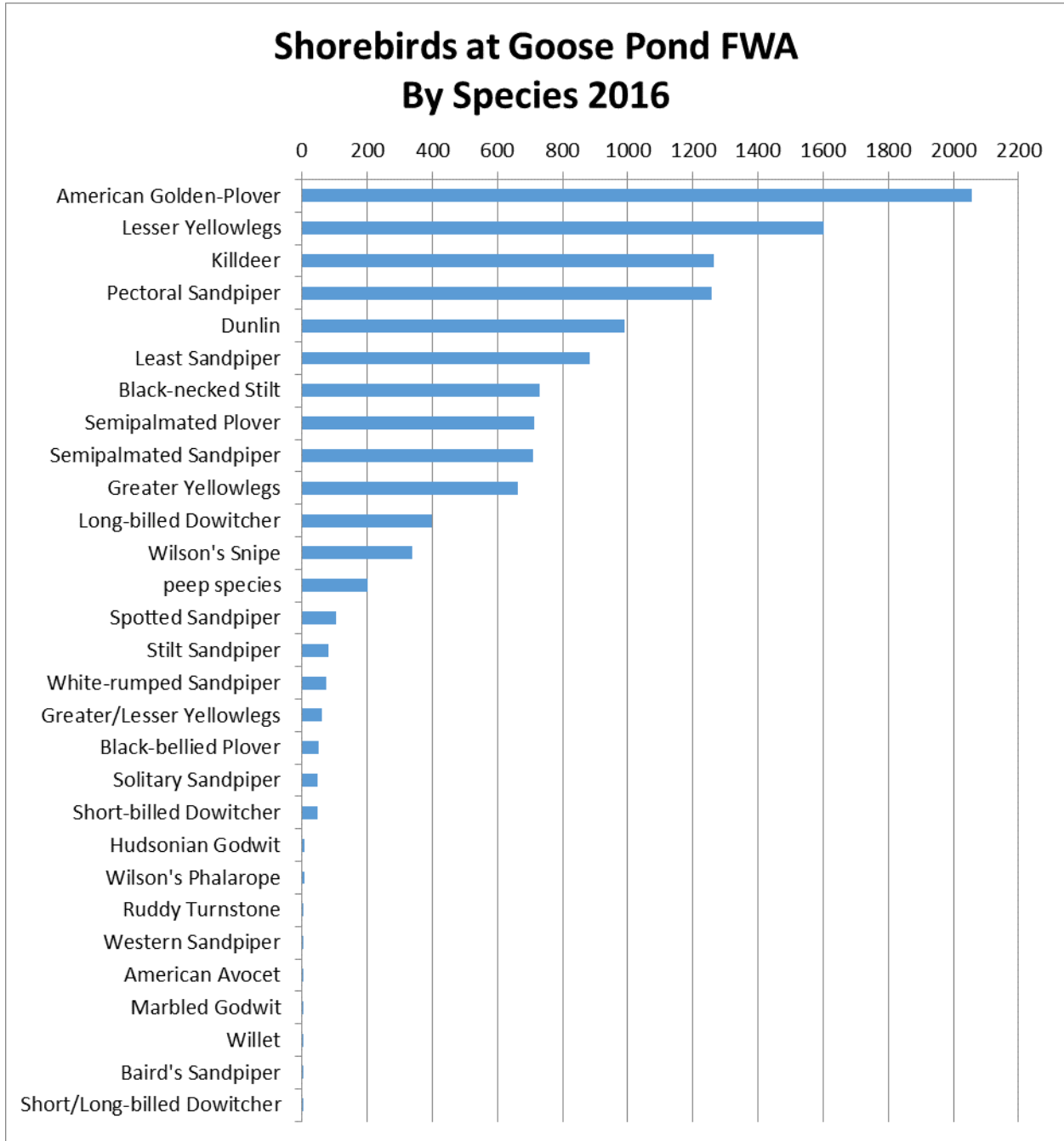


Figure 4. Numbers of shorebirds detected during the Goose Pond FWA 2016 shorebird survey by species. "Peep species" refers to small shorebirds of the genus *Calidris* that are difficult to identify to species at a distance. For exact numbers of observed individuals, see Appendix, Table 1.



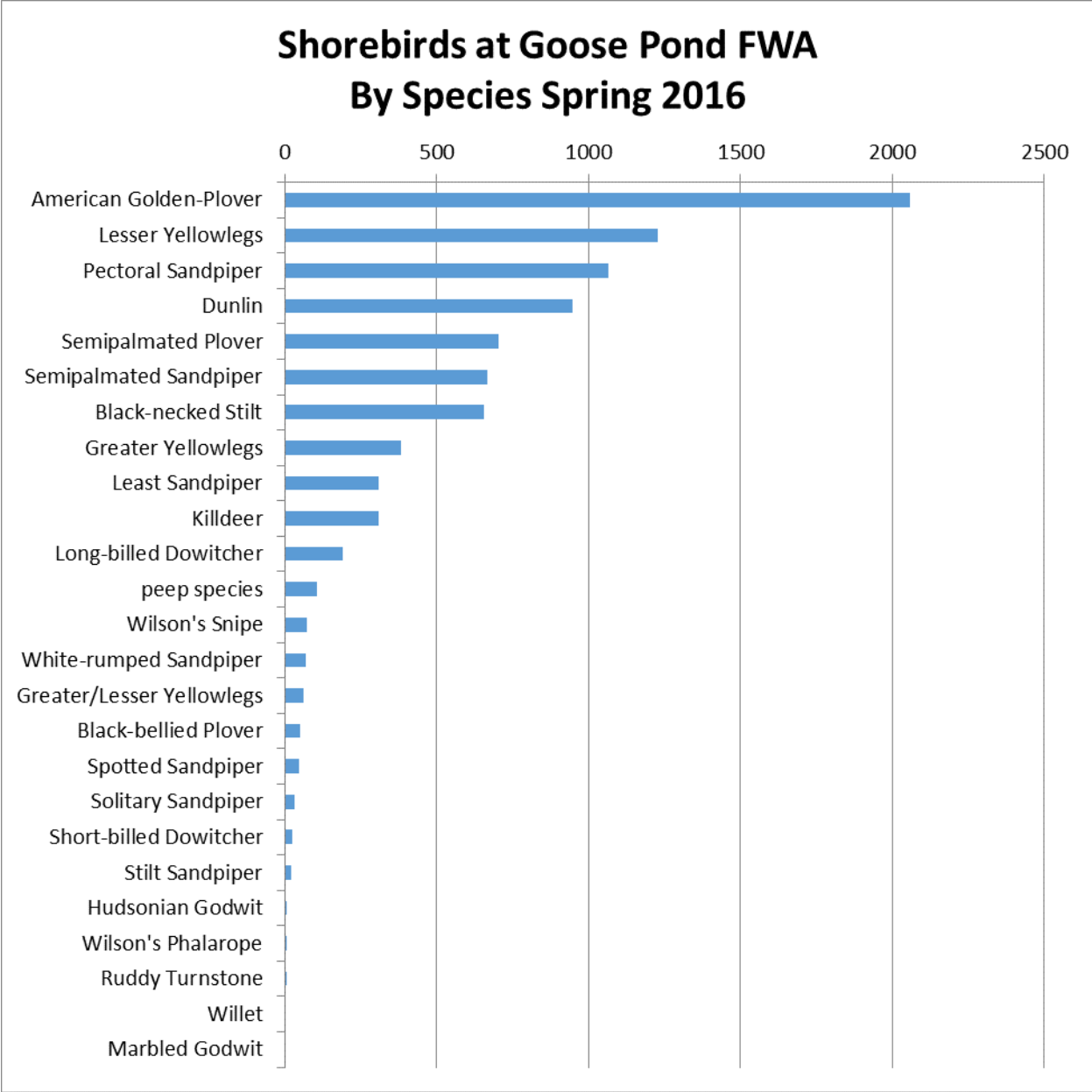
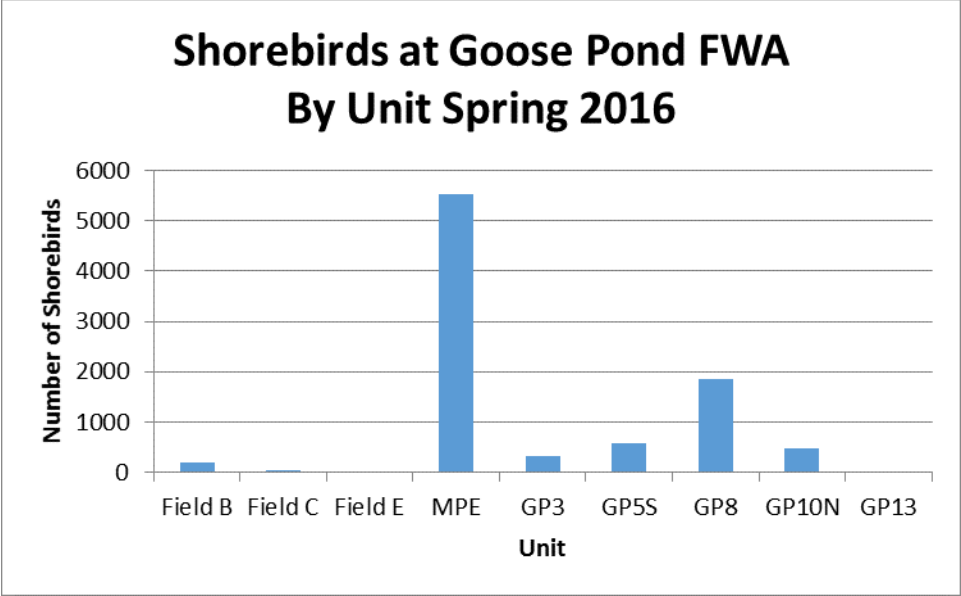


Figure 5. Numbers of shorebirds detected during the Spring 2016 survey by species. “Peep species” refers to small shorebirds of the genus *Calidris* that are difficult to identify to species at a distance. For exact numbers of observed individuals, see Appendix, Table 1.



*Figure 6. Numbers of shorebirds detected during the Spring 2016 survey by unit.*

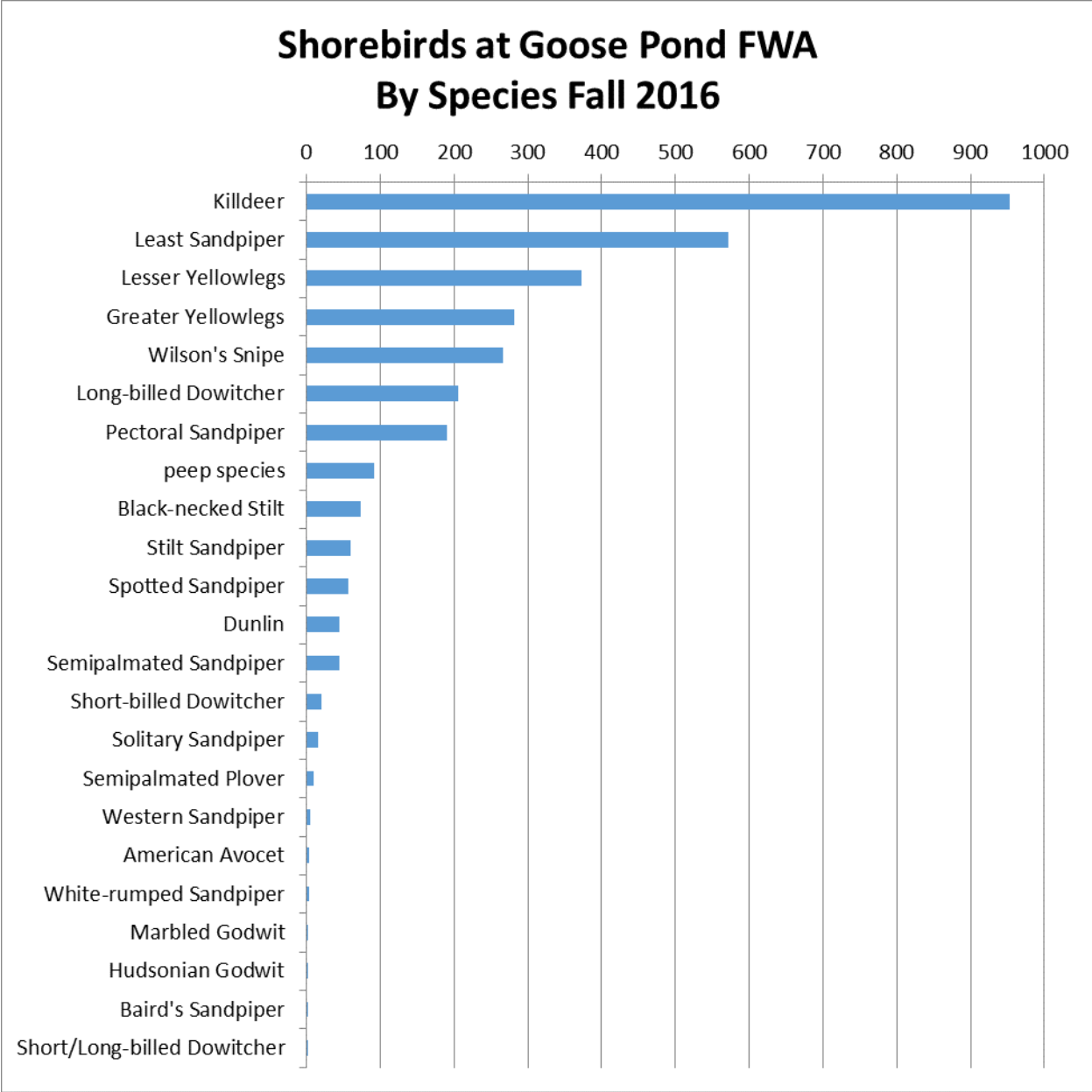


Figure 7. Numbers of shorebirds detected during the Fall 2016 survey by species. “Peep species” refers to small shorebirds of the genus *Calidris* that are difficult to identify to species at a distance. For exact numbers of observed individuals, see Appendix, Table 1.

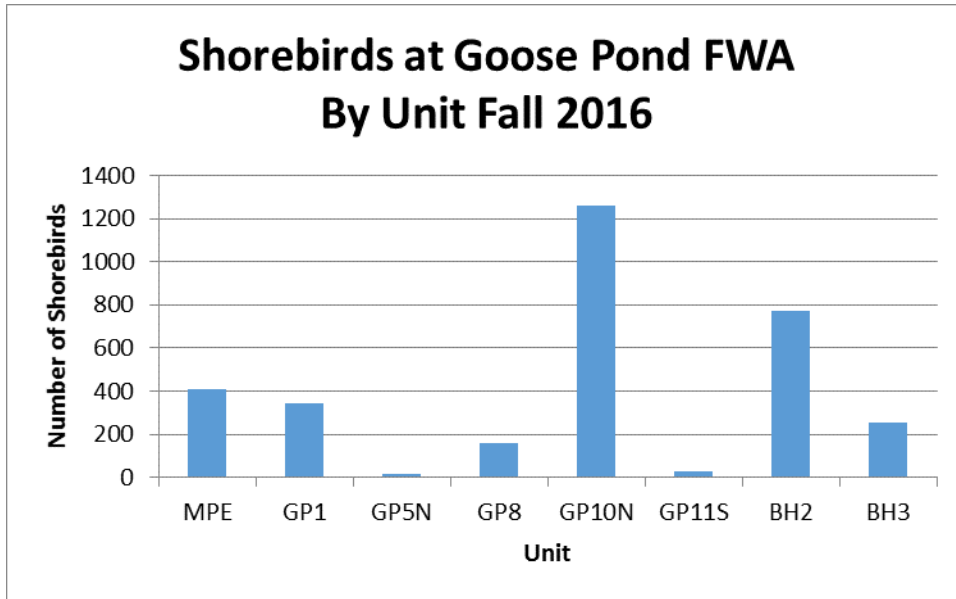


Figure 8. Numbers of shorebirds detected during the Fall 2016 survey by unit.

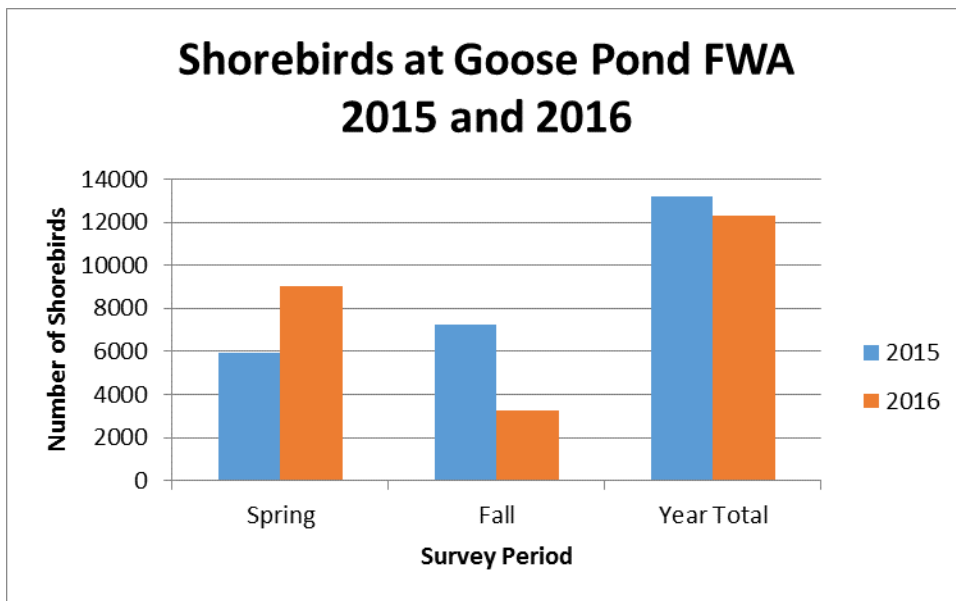


Figure 9. Numbers of shorebirds recorded during spring, fall, and year during the 2015 and 2016 shorebird surveys.

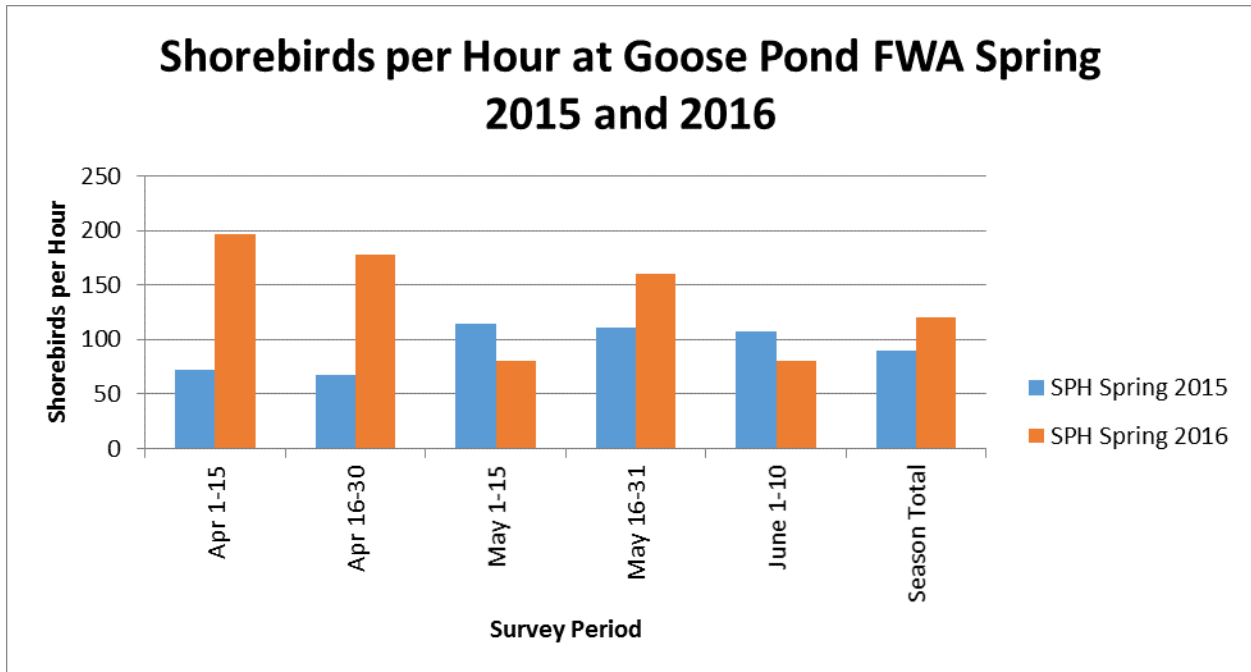


Figure 10. Individual shorebirds recorded per hour (SPH) of surveyor effort during the 2015 and 2016 spring shorebird surveys.

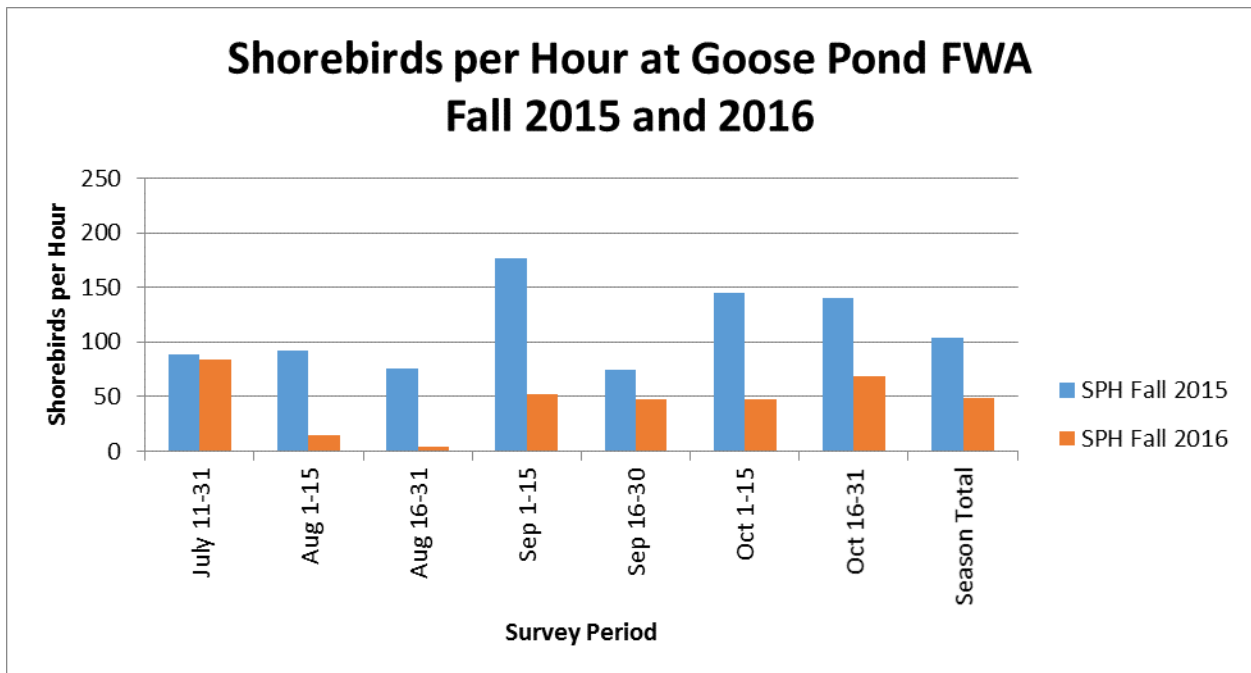


Figure 11. Individual shorebirds recorded per hour (SPH) of surveyor effort during the 2015 and 2016 fall shorebird surveys.

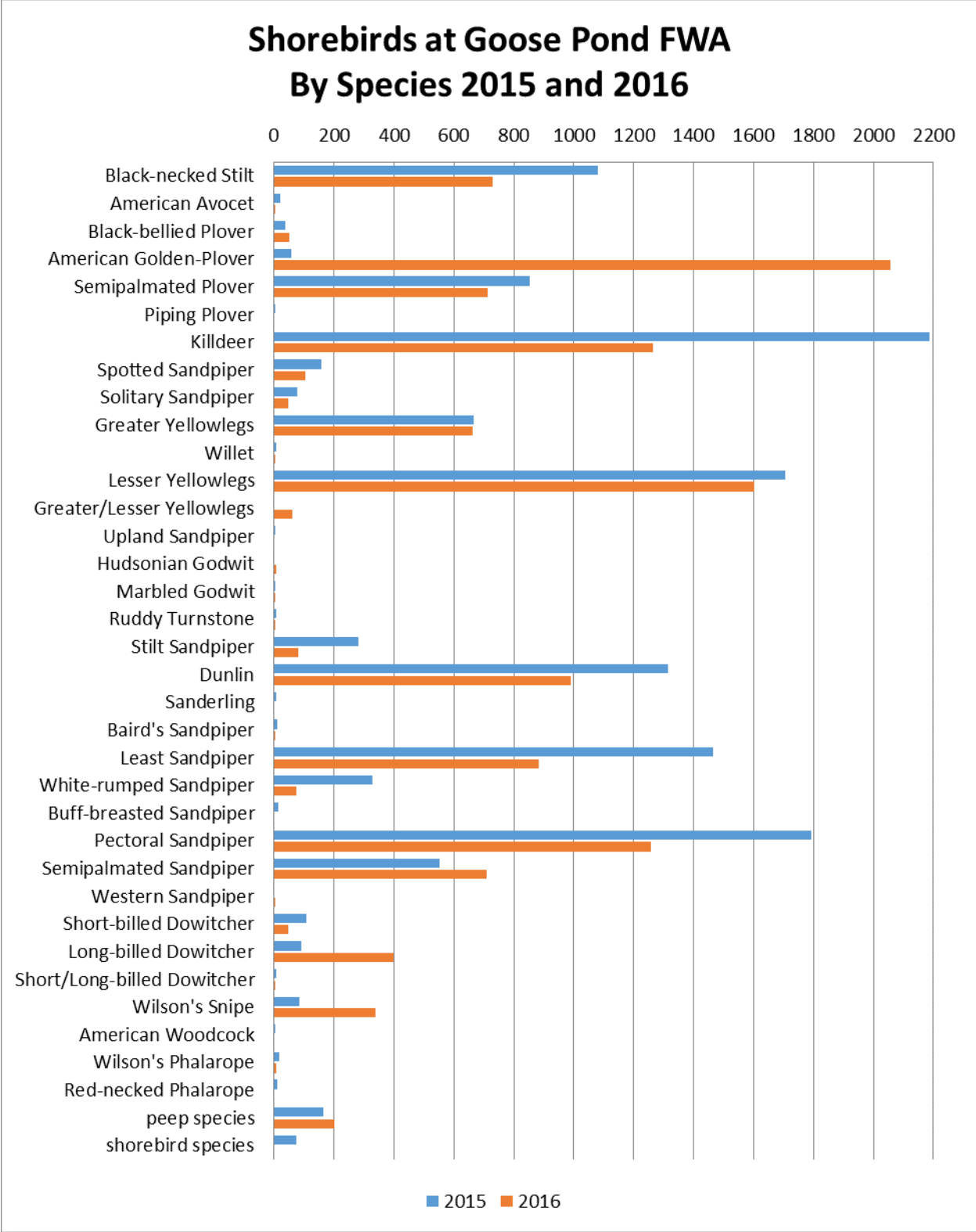


Figure 12. Numbers of shorebirds detected during the Goose Pond FWA 2015 and 2016 shorebird surveys by species, in taxonomic order. “Peep species” refers to small shorebirds of the genus *Calidris* that are difficult to identify to species at a distance.

Watch List Species	State Status	UMVGLR Area Importance (5=highest)	Regional (National) Priority (5=highest)	Requires Immediate Conservation Action	Needs Management Attention	Requires Long-term Planning and Responsibility	Birds of Conservation Concern
Ruddy Turnstone	SC	4	3 (4)	X			
American Golden-Plover	SC	4	3 (4)		X		
Short-billed Dowitcher	SC	4	4 (4)		X		X
Semipalmated Sandpiper		4	3 (3)		X		X
Hudsonian Godwit		4	3 (4)		X		X
Marbled Godwit		3	4 (4)		X		X
Lesser Yellowlegs		4	2 (2)		X		X
Pectoral Sandpiper		4	2 (2)		X		
Willet		3	2 (3)		X		
Dunlin		4	3 (3)			X	

*Table 1. Shorebird species detected during the 2016 GPFWA shorebird survey that are of high conservation concern on the “Watch List” of the U.S. Shorebird Conservation Plan Partnership (2015), with additional columns detailing conservation priority status. The second column describes whether the species is listed in Indiana as a Species of Special Concern (Indiana Division of Fish and Wildlife 2016). In the third and fourth columns, the Upper Mississippi Valley and Great Lakes Region area importance, regional and national priority scores 1-5 are shown, where higher scores indicate greater concern (5=highly imperiled, 4=high concern, 3=moderate concern, 2=low concern, 1=not at risk) (de Szalay et al. 2013). Parentheses in the fourth column indicate national priority status. The sixth, seventh, and eighth columns display whether the species requires immediate conservation action, needs management attention, or requires long-term planning and responsibility (U.S. Shorebird Conservation Plan Partnership 2015). Finally, Birds of Conservation Concern are indicated in the last column (U.S. Fish and Wildlife Service 2008).*



Species	Spring Migration Fall Migration	Spring Peak Fall Peak	Depth Cover	Spring Total Fall Total
American Golden-Plover	23 Mar – 24 Apr 26 Aug – 1 Nov	22 Apr 30 Aug & 20 Sep	Dry – 3” Bare - Sparse	2058 -
Spotted Sandpiper	18 Apr – 23 May 24 Jul – 5 Oct	11 May 18 Jul & 4 Aug	Moist – 1” Bare - Sparse	46 57
Solitary Sandpiper	13 Apr – 12 May 14 Jul – 14 Sep	3 May 23 Jul & 3 Sep	Moist – 2” Bare - Dense	34 15
Greater Yellowlegs	24 Mar – 5 May 23 Jul – 16 Oct	16 Apr 30 Jul & 13 Sep	Dry – 5” Bare - Dense	382 281
Lesser Yellowlegs	24 Mar – 11 May 19 Jul – 16 Oct	24 Apr 22 Jul & 1 Sep	Dry – 3” Bare - Dense	1229 373
Dunlin	14 Apr – 23 May 15 Oct – 23 Nov	14 May 28 Oct*	Moist – 2” Bare - Sparse	946 44
Buff-breasted Sandpiper	- 13 Aug – 20 Sept	- 2 Sep*	Dry – 1” Bare - Dense	- -
Pectoral Sandpiper	22 Mar – 2 May 24 Jul – 25 Oct	12 Apr 9 Aug & 22 Sep	Moist – 1” Bare - Sparse	1066 190
Short-billed Dowitcher	1 May – 18 May 13 Jul – 14 Sep	13 May 16 Jul & 22 Aug	Moist – 3” Bare - Sparse	27 20
Wilson’s Snipe	11 Mar – 26 Apr 3 Sep – 30 Nov	4 Apr 24 Oct*	Moist – 3” Bare - Dense	72 266

*Table 2. Goose Pond FWA target shorebirds table, taken from the 2009-2014 Goose Pond FWA Management Plan (Feaster 2009) and modified to show spring and fall migration peak dates at GPFWA (pers. comm. Ken Brock 2016) and the total number of individuals from each species recorded during the 2016 spring and fall shorebird survey. Two peak dates are given for fall, because adult shorebirds migrate earlier than juveniles, resulting in two distinct peaks (adults and juveniles). \*In three cases, not enough data exist to separate the fall flight by age class, so the fall peak for all records is given.*

Species	BCP Annual High Count Goal	Spring 2016 High Count Fall 2016 High Count
Greater Yellowlegs	225-375	76 on 17 Apr 33 on 28 Sep
Least Sandpiper	60-100	186 on 9 May 184 on 16 July
Pectoral Sandpiper	350-650	436 on 20 Apr 62 on 19 Oct
Wilson’s Snipe	120-280	16 on 7 Apr 130 on 10 Nov

*Table 3. Three shorebird species and the target peak count of individuals using GPFWA as a stopover location each year (calculated by averaging the one-day property high counts over three years 2008-2010), taken from the 2010 Goose Pond FWA Bird Conservation Plan (Brittain et al. 2010), in comparison to the peak counts recorded during the 2016 spring and fall shorebird survey.*

**APPENDIX**

<b>Species</b>	<b>Spring Season Total</b>	<b>Fall Season Total</b>	<b>2016 Total</b>
American Avocet	-	4	4
American Golden-Plover	2058	-	2058
Baird's Sandpiper	-	1	1
Black-bellied Plover	50	-	50
Black-necked Stilt	658	73	731
Dunlin	946	44	990
Greater Yellowlegs	382	281	663
Greater/Lesser Yellowlegs	62	-	62
Hudsonian Godwit	7	1	8
Killdeer	310	953	1263
Least Sandpiper	311	572	883
Lesser Yellowlegs	1229	373	1602
Long-billed Dowitcher	193	206	399
Marbled Godwit	1	2	3
Pectoral Sandpiper	1066	190	1256
peep species	108	92	200
Ruddy Turnstone	6	-	6
Semipalmated Plover	704	9	713
Semipalmated Sandpiper	666	44	710
Short/Long-billed Dowitcher	-	1	1
Short-billed Dowitcher	27	20	47
Solitary Sandpiper	34	15	49
Spotted Sandpiper	46	57	103
Stilt Sandpiper	22	59	81
Western Sandpiper	-	5	5
White-rumped Sandpiper	69	4	73
Willet	1	-	1
Wilson's Phalarope	7	-	7
Wilson's Snipe	72	266	338
<b>Total</b>	<b>9,035</b>	<b>3,272</b>	<b>12,307</b>

*Table 1. Numbers of shorebirds detected during the Goose Pond FWA 2016 shorebird survey by species, in alphabetical order. "Peep species" refers to small shorebirds of the genus Calidris that are difficult to identify to species at a distance.*

Species <sup>a</sup>	Primary foraging sites						Foraging mode			Vegetation height			Vegetation cover			
	Shrubland	Grassland	Beach	Dry mudflat	Wet mudflat	Shallow water (0-5 cm)	Moderate water (5-20 cm)	Terrestrial pecking / gleaning	Aquatic gleaning / sweeping	Probing	0-5 cm	5-20 cm	>20 cm	None to sparse	Sparse to moderate	Moderate to dense
Black-bellied Plover				X				X			X			X		
<b>American Golden-Plover</b>				X				X			X			X		
Semipalmated Plover					X			X			X			X		
<b>Piping Plover</b>			X					X			X			X		
<b>Killdeer</b>				X				X			X			X		
Black-necked Stilt							X	X			X	X			X	
American Avocet							X	X			X			X		
Greater Yellowlegs						X		X			X				X	
Lesser Yellowlegs						X		X			X				X	
Solitary Sandpiper					X			X			X				X	
Willet						X		X			X				X	
Spotted Sandpiper					X			X	X	X	X			X		
<b>Upland Sandpiper</b>		X						X			X				X	X
Whimbrel							X	X	X	X	X					X
Hudsonian Godwit							X		X		X				X	
Marbled Godwit							X		X		X				X	
Ruddy Turnstone			X					X	X	X	X			X		
Red Knot					X			X	X		X			X		
<b>Sanderling</b>			X					X	X		X			X		
Semipalmated Sandpiper					X			X	X		X			X		
Western Sandpiper					X			X	X		X			X		
Least Sandpiper					X			X	X		X			X		
White-rumped Sandpiper					X			X	X		X			X		
Baird's Sandpiper				X				X	X		X			X		
Pectoral Sandpiper					X			X	X		X			X		
<b>Dunlin</b>					X			X	X		X			X		
Stilt Sandpiper						X		X	X							
Buff-breasted Sandpiper				X				X	X		X			X		
<b>Short-billed Dowitcher</b>						X		X	X		X			X		
Long-billed Dowitcher						X		X	X		X			X		
<b>Wilson's Snipe</b>					X			X	X			X			X	
<b>American Woodcock</b>	X								X			X				X
<b>Wilson's Phalarope</b>						X		X	X		X			X		
Red-necked Phalarope						X		X	X		X			X		

Table 2. Foraging sites, mode of feeding, and habitat characteristics of migratory shorebirds occurring in Indiana. <sup>a</sup>Bold names are Joint Venture focal species selected for planning and monitoring emphasis. Taken from Upper Mississippi River and Great Lakes Region Joint Venture Shorebird Habitat Conservation Strategy (Potter et. al. 2007).



