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Cover photo: Observers were treated to this rare, juvenile Long-tailed Jaeger for ten days at Eagle Creek, *Marion* seen here 5 Oct 2011. Photo by Marty Jones

Back cover photo: Hudsonian Godwits, Goose Pond, *Greene*, 1 Sep 2011. Photo by Michael Brown

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Letter from the President

Brad Bumgardner

Welcome to another exciting year for Indiana Audubon Society. As you are reading this, I will find myself deep in Indiana Audubon's second out of country birding tour to the wild lands of Cuba. As we're wrapping up a memorable Snowy Owl winter, myself and other IAS members are counting Trogans, Todies, and Bee Hummingbirds. The current Cuba trip is an exciting facet of some of the work Indiana Audubon has been doing. Even if you couldn't make it, the trip represents our continued work with similar minded organizations. Here, this trip would not be possible without the Caribbean Conservation Trust. Just in the last few months, partnerships have been strengthened or renewed with various organizations. Proven to be quite popular was last month's joint Gull Identification Workshop, a partnership with the local Amos Butler National Audubon chapter. Perhaps you can pick out that first winter California Gull now!

As incoming President, it has become my torch to carry to ensure that these and new partnerships continue to be forged. This organization and its members, like you, can do lots; but the work we do to strive towards our mission statement is doubled, tripled, and more when it's done with the help of others. Let's continue these partnerships in 2012! I, like many others, have had to think hard about the many magazine and organization subscription renewals that hit my mailbox. Cost of living increases still do not fill the empty wallet and for many years now I've been faced with what memberships to let slip to the wayside. It seems so many national organizations only offer 6 regular magazines or newsletters. Though beautiful, these magazines alone don't seem to provide everything that the organization should be able to offer to get my hard earned money.

This only brings me back full circle to the continued value of an Indiana Audubon membership. Since 1898, the Indiana Audubon has provided much more than a hardcopy newsletter for its members. Today, with the advancement of digital technology, cost savings have been forwarded to its members with extra membership benefits and the most important feature... no membership increases! Have you used your Birds of North America membership!? If not, why! Imagine the ultimate encyclopedia of bird knowledge at your fingertips 24/7. Others pay nearly \$500.00 for a year of access, but it's made available free to all Indiana Audubon members. I know of no other nature organization in the United States that provides that to its members.

Have you taken part in an IAS field trip? Whether its gulls, prairie chickens, spring warblers, or our ever present logo, the cardinal, we have some great expert members that

step forward to teach others. Some have dedicated themselves to the teaching of our birding youth, thus the Indiana Young Birder's Club was born a few years ago.

It is clear there is something for everyone in the Indiana Audubon. With so many perks and benefits, the value of an IAS membership far outweighs its cost. Is there a membership perk you would like to see, send me or any of the hard serving board members a note, we'd love to hear from you.

Yours Truly,

Brad Bumgardner

Indiana Audubon President

Field Notes Fall 2011

Brad Bumgardner- bbumgardner@dnr.in.gov

The fall of 2011 will be remembered for few reasons. The fall season came off the heels of a hot summer, but cooled by early September, with below average temperatures. After a powerful system during the first weekend in October, another two weeks of warm weather followed. Another bout of moderation brought another couple weeks of above normal temperatures. November ended with lots of warm weather, strong south winds, and without any measurable snowfall anywhere in the state. The typical strong NW winds associated with cold fronts were uncharacteristically absent along Lake Michigan in November.

With no particular bird, event, or otherwise, it will go down as generally bland to many birders. Many of the actual rarities seen were in nearby states, restricted in access or one day wonders, leaving most birders without a new tick on their life or state list.

While less than memorable, there were plenty of bird records and notables to make up for the lack of stellar flights or rarities. In particular, high counts, low counts, early and late date records were the theme of the season. Another exception was Goose Pond, where a large expanse of mudflat in GP10 attracted a large variety and good numbers of shorebirds. Following suit, Eagle Creek reservoir hosted a confiding, long-staying juvenile Long-tailed Jaeger, Laughing and Franklin's Gulls. In general, warbler flights were much stronger as one went southward in the state.

Highlights included; Wood Stork, Little Gull, a strong shorebird flight that included much-celebrated Hudsonian Godwits, an unprecedented flight of Red-necked Phalaropes, White-rumped Sandpipers, lots of jaegers, including all three species and multiple inland records, Snowy Owl, Western Wood-Pewee, and a possible record of Swainson's Warbler.

The editor is indebted to Ken Brock for his statewide fall report, which is heavily referenced in this year's Fall Field Notes.

Reports were submitted by: Jim Haw, Alan Bruner, Roger Hedge, and Ken Brock. Photos provided by Michael Brown, John Kendall, Marty Jones, Debbie Peterson, Michael Topp, Ryan Sanderson, and Brad Bumgardner.

Abbreviations:

FWA = Fish & Wildlife Area

NWR = National Wildlife Refuge

SP = State Park

SRA = State Recreation Area

GBHA = Game Bird Habitat Area

TNC = The Nature Conservancy

SPECIES ACCOUNTS

Black-bellied Whistling-duck – Mark Pochon, the DNR Property Manager at Hovey Lake FWA, Posey Co., reported (2) at nearby Weyerbacher wetland unit on 14 September. They had been reported to have been there one week.

Greater White-fronted Goose- Many reports came in, with incredible highs being reported in the southern part of the state, dominated by Cane Ridge FWA, Gibson, and Goose Pond FWA, Greene Co., with new site high counts being recorded for the latter property. The season's highest count of (771) was recorded at Cane Ridge FWA, Gibson Co., by Lee Sterrenburg on 20 November, followed by (500) at the same location on 29 October by Evan Speck, and finally (311) seen at Goose Pond FWA 16 October by Lee Sterrenburg.

Snow Goose - With dozens of reports again this year, this species apparently continues to be observed in increasing numbers in both spring, and now fall. This fall's largest count was a spectacular flight of (1,020) birds seen flying by Lake Michigan from Lake Street Beach, Lake Co., on 25 November (Jeff McCoy).

Ross's Goose- Ross's Geese continue to increase with Snow Geese reports, and are most often seen with Snow Geese. Approximately a dozen singletons were reported throughout the state, with (2) each being seen at Cane Ridge FWA by Chuck Mills on 12 November and Lake Street Beach, Lake Co., on 25 November (Jeff McCoy)

Cackling Goose- Indiana's earliest fall records occurred this season with the state's new earliest on 13 September at Pigeon River FWA, Steuben Co., (Jim Haw). The state's second earliest occurred 17 September during a Big Sit at Indiana Dunes SP, Porter Co., by many observers. Other early reports came from Fiddler's Pond, Elkhart Co., on 21 September by John Harley, Brookville Lake, Franklin Co., on 29 September (Bill Buskirk), and by Jim Haw at Mississinewa Reservoir,

Canada Goose- One flock of (1275) seen at Eagle Creek Park, Marion Co., was noteworthy (Spike Selig).

Mute Swan- Numbers continue to climb in northern Indiana. Melissa Kinsey reported high counts at the Reith Interpretive Center, Elkhart Co. These counts included: (41) on 15 September, (34) on 21 September, (36) on 6 October, and (35) on 26 October.

Wood Duck – An incredible (2070) were recorded by Jed Hertz at LaSalle FWA, Newton Co. on 15 August. (500) were also flushed by Lee Sterrenburg at Goose Pond FWA on 21 August.

Gadwall – Goose Pond FWA once again is providing fine dabbler counts with a new state record (1,622) birds being counted on 22 November (Lee Sterrenburg and Brad Feaster). A count of (588) was also significant at Cane Ridge FWA on 10 November.

American Wigeon- A count of (100+) at Stillwater Marsh, Brown Co., was the only notable report.

American Black Duck - The 70 birds reported statewide is the lowest in over ten years.

Blue-winged Teal- Many large counts occurred, with Goose Pond FWA leading the pack with high counts of: (1,055) on 14 September, (623) on 27 September, and (621) on 21 August. (205) by (John Kendall) at Miller Beach, Lake Co., was also worth noting. Finally, (42) birds were logged in November statewide; well past the expected departure date.

Northern Shoveler- Again, large counts dominated at Goose Pond FWA, with: (387) on 27 September, (364) on 7 October, and (254) on 18 October. Cane Ridge FWA logged (114) on 14 September (Gary Bowman and Amy Kearns).

Northern Pintail- (115) recorded at Miller Beach by Ken Brock et al. was the seasons highlight.

Green-winged Teal- Like other dabblers, the best counts again came from Goose Pond FWA, with (509) on 7 October and (382) on 12 October (Lee Sterrenburg et al.).

Redhead- The clear highlight was a remarkable (279) on 3 November by John Kendall at Miller Beach. This is the third highest count for the lakefront.

Ring-necked Duck- Ring-necked Duck numbers spiked in late October at Goose Pond FWA. Two notable counts came from Lee Sterrenburg et al. with (614) seen 1 November and (587) seen 25 October.

Greater Scaup- (5) seen at Miller Beach on 30 September by Ken Brock et al. were notably early. Another early bird was seen on 5 October by Lee Sterrenburg et al. at Goose Pond FWA. The most significant surge occurred on 3 November when John Kendall counted (975).

Lesser Scaup- Two great fall counts were recorded on the Lake Michigan lakefront on the same day. On 3 November Ken Brock et al. recorded (620) in Beverly Shores, Porter Co., while John Kendall found (1,245) at Miller Beach.

Harlequin Duck- (3) birds were seen on Lake Michigan this fall. The first two coincided with the Lesser Scaup flights on 3 November by John Kendall and Ken Brock et al. The third bird, a male, was seen flying by on 4 November at Miller Beach (Michael Topp).

Surf Scoter- Four reports came away from Lake Michigan this fall. They included (1) bird at Whitewater State Park, Franklin Co., on 24 November (Bill Buskirk). (1) was seen at Fairfax SRA, Monroe Co., on 4 November (Amy Kearns). Another bird was reported on Lake Monroe 22 October and 24 October.

White-winged Scoter- During the waterfowl surge on 3 November, (14) were observed by (John Kendall) at Miller Beach. (Amy Kearns) had up to (3) at Fairfax SRA on 4 November.

Long-tailed Duck - Indiana's sixth earliest fall record occurred on 20 October, when (2) birds were observed at Miller Beach (Ken Brock et al.). Another was seen on 3 November at Miller Beach (John Kendall). One unconfirmed report came from Lake Lemon, Monroe Co., on 22 November.

Bufflehead - The seasons best count was (189) by John Kendall on 3 November.

Hooded Merganser- Two notable inland high counts occurred this fall. Don Gorney counted (79) at Eagle Creek on 23 November. Bill Buskirk logged (56) on Brookville Lake 16 November.

of a red morph of this difficult to find species in Brown Co on 15 April (David Daniels).

Common Merganser- (6) birds seen by Barny Dunning at Beverly Shores were a few weeks early.

Red-breasted Merganser- A combined (63) birds seen by at Beverly Shores and Michigan City Harbor, LaPorte Co., represent the most notable sighting this fall (Ken Brock et al.).

Ruddy Duck - Two reports were most significant this fall with this stiff tailed duck. (140) were seen at Cane Ridge FWA on 12 November by Evan Speck and Chuck Mills, while a smaller (49) were seen 10 November at the Reith Interpretive Center, Elkhart Co.

Ruffed Grouse - Amy and Noah Kearns discovered a gray phase bird on 29 September in the Hoosier National Forest, Lawrence Co. This bird represents the fall's only sighting of this increasingly decreasing species.

Red-throated Loon - An inland immature bird was viewed by many birders at Muscatatuck NWR, Jackson Co., for six days beginning 22 October. Strangely, no major counts were recorded on the lakefront this fall.

Common Loon - Similar to Red-throated Loons, few large counts stemmed from the Lake Michigan area. The largest count was (311) from Lake Lemon on 16 November. Other notable counts included (185) on Lake Monroe 12 November and (110) at Cane Ridge FWA 12 November.

Horned Grebe - An early diving bird was discovered at Miller Beach on 19 August (Michael Topp).

Red-necked Grebe - (4) reports came in for this larger, rarer grebe. (1) was seen 1 September, when the state's earliest fall record was seen at Miller Beach by Jeff McCoy. Another bird was seen 19 November at Miller Beach by John Kendall. On the same date (1) bird was observed on Clear Lake, Steuben Co., by Jim Haw. Finally, an unconfirmed sighting occurred 5 September in a pond at the Indianapolis Museum of Art, Marion Co.

Eared Grebe - (1) Eared Grebe was observed on Lake Lemon on 23 October (Jim and Susan Hengeveld).

American White Pelican - Two locations hosted pelicans this fall. (1) bird was observed on the Indiana side of the Ohio River at Fall of the Ohio State Park, Floyd Co., by Ed Peter on 11 August and Lee Sterrenburg et al. had Goose Pond FWA records as well. Goose Pond sightings involved (2) birds on 4 October, (1) bird on 7 October, and (42) birds on 17 October.

American Bittern - Goose Pond FWA hosted multiple birds throughout the fall, with (7) being the single day high count on 30 August (Lee Sterrenburg et al.). Additionally, Cane Ridge FWA had two sightings this fall.

Least Bittern - A healthy (25) birds were reported in the fall period. Many came from Goose Pond FWA, but other records also originated from Eagle Marsh, Allen Co., Bluegrass FWA, Warrick Co., and the lakefront's second record in 24 years.

Great-blue Heron - More than (100) were reported throughout the season at Goose Pond FWA by multiple observers.

Great Egret - Numerous egret reports filtered in throughout the fall, with multiple (100+) counts. Goose Pond FWA led the way with an amazing high of (458) birds by Lee Sterrenburg et al. on 29 August. A very late bird was seen on 25 November at Miller Beach (Jeff McCoy).

Snowy Egret - Reports came from Cane Ridge FWA 31 August and 13 September, Moore's Creek Inlet, Monroe Co., Pine Creek GMA, Benton Co., 13 September, and Roush Lake, Huntington Co., 12 November.

Snowy Egret - Reports increased this year, led by (3) at Cane Ridge 28 May (Steve Gifford), and singles at Cane Ridge, Gibson Co., 20 April (Amy Kearns & John Castrale), Vermillion Co., (Michael Brown) 29 April, and a maximum of (2) at Goose Pond 31 May (Lee Sterrenburg).

Black-crowned Night-Heron - Reports came from the traditional sites of Falls of the Ohio, Goose Pond FWA, Gibson Lake, and the Hammond area, Lake Co. An impressive count of (47) was seen by Lee Sterrenburg et al. on 31 August at Goose Pond FWA.

Yellow-crowned Night-heron - (2) birds were reported from Goose Pond FWA; the first by Lee Sterrenburg on 28 August and the second by Evan Speck et al. on 9 September.

Plegadis Ibis - Eight reports came in through the fall of an unidentified fall plumaged ibis. All were found at Goose Pond FWA. Dates for sightings occurred 23 October, 29 October, 30 October, 1 November, 6 November, 19 November, 22 November, and 26 November.



Figure 1. Plegadis Ibis, Goose Pond, Greene, 6 Nov 2011 Photo by Michael Brown



Figure 2. Wood Stork, 21 Aug 2011, Vigo, Photo by Marty Jones

WOOD STORK- A Vigo Co. bird was reported on private property on 21 August (Dan Weber, Peter Scott, Jim Sullivan, Michael Brown, Marty Jones ph.).

Black Vulture – Aside from the typical southern Indiana reports, a more remarkable 13 November northern Indiana bird was located at Kankakee FWA, Starke Co. (Steve Sass et al.).

Mississippi Kite- (2) birds were found in rural LaPorte Co., by Lynea Hinchman on 27 August. One was subsequently photographed by Eric Troske on 28 August.

Northern Goshawk- A juvenile was observed and photographed 29 Oct. at the home of K.J. Brock, providing a fine record and even better yard list bird!

Red-tailed Hawk- One notable high-count came from the Green Tower site at Indiana Dunes State Park, Porter Co. On 17 September, (53) birds were logged during a big sit by Ken Brock et al. The majority of them were first year birds.

Golden Eagle- Five locations hosted fall Golden Eagles this season. The first of the season was seen at West Beach, Porter Co., on 22 October (John Kendall et al. On 18 November two birds were simultaneously seen at Monroe Lake, Monroe Co., and Salamonie Reservoir, Wabash Co. (1) bird was found on 25 November at Versailles State Park, while (1) other bird was seen at Cane Ridge FWA on 26 November and 1 December.

YELLOW RAIL- (1) lone fall report came from Goose Pond FWA (DNR Staff) on 25 August.

King Rail- The first fall bird was heard on 1 August at Eagle Marsh by Ed Powers. Additionally, a calling bird was heard by multiple birders at Pigeon River FWA between 30 August and 5 September.

Common Gallinule- It was a good fall for this wetland bird. (121) individuals were reported during the fall period, with multiple reports coming from Goose Pond FWA, Eagle Marsh, and Pigeon River FWA, Lagrange Co.

American Coot- An enormous flock of (8300) was recorded at Goose Pond FWA (Lee Sterrenburg et al.) on 26 October.

American Golden-Plover- The first (2) birds were reported at Goose Pond FWA on 21 August by Amy Kearns et al. Other than the early report, birds were few or seen in smaller numbers this fall.

Piping Plover- Only (1) bird was reported during the entire fall season. A perennial favorite location, a lone bird was found 6 August at Miller Beach (Ken Brock et al.).

Black-necked Stilt- A spectacular fall count of (60) birds was found at Goose Pond 5 September (Lee Sterrenburg et al.).

American Avocet - A flock of (10) were found at Cane Ridge FWA by Vicki Whitaker on 30 October.

Willet- A slower fall for this large shorebird. Aside from (22) seen on the lakefront (Ryan Sanderson) on 20 August, the most significant report was a Goose Pond FWA bird seen (Steve Gifford) on 24 September.

Upland Sandpiper- The season's only bird was oddly on the lakefront. On 9 August, a single bird flew into the US Steel impound at Miller Beach. The bird was seen by Ken Brock et al., and provides the first lakefront record in 23 years.



Figure 3. Hudsonian Godwits, Goose Pond, Greene, 2 Sep 2011, Photo by Michael Brown

Whimbrel- The lakefront had (3) reported birds during the fall period.

Hudsonian Godwit- It was a notable fall for this large-billed shorebird. The first (2) birds were reported at Goose Pond FWA (Lee Sterrenburg) on 31 August. A juvenile bird landed on Miller Beach to the joy of Ken Brock et al. on 3 September. Later birds showed up again at Goose Pond FWA, Cane Ridge FWA, and Eagle

Marsh. The season high count was (5) at Goose Pond FWA on 4 September.

Marbled Godwit- Only (2) were identified to species this season at Goose Pond FWA by Lee Sterrenburg et al. on 20 August. An odd year in which more Hudsonians were reported than Marbled!

Sanderling- Many lakefront and inland locations reported this cute shorebird during the fall. The high count went to Miller Beach, where (200+) were reported on 1 September by Jeff McCoy. Juvenile birds dominated the flocks.

Western Sandpiper- Thirteen individual days had this shorebird reported from Goose Pond FWA. The largest count was (4) birds seen (David Crouch) on 6 September.

White-rumped Sandpiper- (27) birds were reported throughout the state in various places. Each sites reported one or two birds total.

Baird's Sandpiper- (14) birds were seen at Goose Pond FWA on 11 September (Amy and Noah Kearns).

Pectoral Sandpiper- Amy Kearns et al. counted an impressive group of (576) at Goose Pond FWA 21 August.

Purple Sandpiper- A single bird was reported on 23 November at Michigan City, LaPorte Co., by (John Kendall). The bird was seen on the outer break wall.

Dunlin- A single bird seen on Pierce Road, St. Joseph Co., by Bob Huguenard on 12 August was very early.

Stilt Sandpiper- A peak count of (60) birds occurred at Goose Pond FWA by Sterrenburg et al. on 5 September.

Long-billed Dowitcher- Goose Pond FWA dominated the reportings, with Cane Ridge FWA and Miller Beach each reporting a bird.

Red-necked Phalarope- In total, over seventy birds were logged from various locations throughout the state. Goose Pond FWA had (6) birds multiple times to take the high count location.



Figure 4. One of a record six Pomarine Jaegers, 29 Nov 2011, Miller Beach, Lake, Photo by Ryan Sanderson

Pomarine Jaeger- On 29 November, (6) birds were logged during a lakewatch at Miller Beach (Ken Brock et al.). The birds accompanied a stiff 35 knot northeast wind. The six seen constitute a new daily count record.

Parasitic Jaeger- A nice fall with (24) total birds counted at various places along the lakefront and inland took place. An abundance of jaegers was described on 5 September when Ken Brock et al. counted (8) out of fifteen jaegers seen that day as Parasitic. It was the lakefront's fourth highest count.



Figure 5. Adult California Gull, Michigan City, *LaPorte*, 14 Nov. 2011, Photo by J.C. Kendall

LONG-TAILED JAEGER- Aside from a few lakefront reports, the most documented and seen bird was one that appeared at Eagle Creek Park, Marion Co., on 1 October. The bird was originally found by Terry Walsh and tentatively identified as a Parasitic, but photo confirmation (Ryan Sanderson) changed the “call”. The bird stuck around for ten days.

CALIFORNIA GULL- During a rare bird shortage, while other states enjoyed spectacular sightings, John Kendall broke Indiana’s drought with (1) individual on the Michigan City beach on 14 November.

Laughing Gull- Many sightings occurred, including birds at Michigan City Harbor, Eagle Creek Park, Mississinewa Reservoir, and Lake Monroe.

Laughing x Ring-billed Gull hybrid- This bird, having been seen many seasons now near the IN-IL line, was spotted again on 11 November by Amar Ayyash from Calumet Park, Cook Co., IL, flying into Indiana waters and towards Hammond.

Franklin’s Gull- Tim Griffith reported (10) early birds at Cane Ridge FWA on 13 September.



Figure 6. Juvenile Little Gull, 29 Nov 2011, Port of Indiana, Porter, Photo by Pete Grube

Little Gull- On 29 November, birders watched (1) bird from the Port of Indiana, Porter Co. The bird was originally spotted by Pete and Brendan Grube.

Bonaparte's Gull- An early adult bird was discovered by Michael Topp at Miller Beach on 5 August. The season's high count goes to Bill and Bob Buskirk, who found (550) at Brookville Lake on 7 November.

Great Black-backed Gull- An early 5 September report of (1) bird from Miller Beach was significant.



Figure 7. Black-legged Kittiwake, 30 Nov 2011, Port of Indiana, Porter, Photo by Michael Topp

Black-legged Kittiwake- The first birds of the season were seen on 4 November, when (3) were observed flying by Miller Beach (Michael Topp). While searching for a Little Gull, a single bird gave close flybys for several gull enthusiasts at the Port of Indiana on 30 November (Amar Ayyash, Patty Topp, et.al.).

Common Tern- A maximum count of (332) were seen flying off-shore on 3 September from Miller Beach (Ken Brock et al.).

Black Tern- A high count of (141) was logged from Miller Beach (Ken Brock et al.) on 18 August.

Monk Parakeet- (2) birds were recorded flying by Forsythe Park, Lake Co., (Ken Brock et al.) on 15 October. These two represent the only reported parakeet sightings this fall.

Barn Owl- A very notable single Barn Owl was flushed from the foredune area at the Portage Lakefront Park, Porter Co. on 12 November. Jeff McCoy arranged for stellar views for multiple birders that day.

Snowy Owl- The first confirmed sighting this fall was a lone bird 18 November in rural Starke Co. This was the first of many reported birds later in the winter season.

Long-eared Owl- Sightings of this secretive owl were few this fall, compared to last year. One was reported in the West Beach Pinery, Porter Co., on 29 October (Ken Brock et al.) A high count of five was at West Beach Pinery, 7 November (J.C. Kendall).

Northern Saw-whet Owl- A lone bird was found in a traditional private location (Kylie Arvin) in Lafayette, Tippecanoe Co. on (12 November) and seen through the fall period. Indiana banding reports have included (43) captured between two stations in Yellowwood State Forest, Brown Co., by Brittain et al., (30) captured at Newark, Greene Co., by Jess

Gwinn, (26) captured at Indiana Dunes SP by Brad Bumgardner et al., and (24) captured near Brookville by Tim Tolford et al.

Common Nighthawk- The season's best count came from Amy Kearns when (120) birds were seen migrating near Mitchell, Lawrence Co. on 12 September.

Eastern Whip-poor-will- (3) birds were still heard at Willow Slough on 16 September (Jed Hertz).

Chimney Swift- (500) were noted at Goose Pond FWA by Amy Kearns et al. on 2 October.

Rufous Hummingbird- (1) bird was seen by private homeowners in Evansville, Vanderburgh Co. on 29 November. Another *Selasphorus* hummingbird was seen in Huntington, Huntington Co. on 29 August.



Figure 8. Green Violet-ear, 1 Aug 2011, Fountain, Photo by Debbie Peterson

GREEN VIOLETEAR- A second state record bird was present for a couple of days at a feeder. The Fountain Co. bird was last seen 2 August (Barny Dunning et al.).

Belted Kingfisher- A remarkable (29) counted along the White River in Lawrence Co. is a new state high count (Amy and Noah Kearns et al.).

WESTERN WOOD-PEWEE- Indiana's second state Western Wood-Pewee found during the summer continued to be heard singing (Michael Topp) on 6 August and 19 August. Later

attempts at the bird failed.

Yellow-bellied Flycatcher- (3) birds were captured and banded during the Hoosier Outdoor Experience on 17 September. The event takes place annually at Fort Harrison SP., Marion Co.

Eastern Kingbird- (34) were seen at Bluegrass FWA, Warrick Co., on 6 August.

Loggerhead Shrike- Four Loggerheads were reported during the fall season. The first was spotted by (Chuck Mills) near Fort Branch, Gibson Co., on 9 August. The second bird was also located by (Chuck Mills) on the same day, just northeast of Newburgh, Warrick Co. (Lee Sterrenburg et al.) also located a bird at Goose Pond FWA on 19 August. The season's fourth bird was found in rural Vanderburgh Co. by (Dan Collins) on 6 September.

Northern Shrike- The lakefront provided plenty of shrike watching opportunities this fall. The first Northern Shrike was found by Ken Brock on 25 October in Beverly Shores, Porter Co. Many subsequent sightings and multiple bird sightings occurred. An additional bird was found (John Kendall) at West Beach 7 November. A Fort Wayne bird was found on 31 October at Saloman Farm Park, Allen Co.

Bell's Vireo- A state late bird was observed at Brookville Lake on 29 September (Bill Buskirk).

Blue-headed Vireo- A territorial bird was heard at Pigeon River FWA by Jim Haw on 8 August. At West Beach, (Ken Brock et al.) obtained photos of the 5th latest lakefront record for this beautiful vireo on 29 October.

Warbling Vireo- Jim Haw recorded the state's latest fall bird at Mississinewa Reservoir, Miami Co., on 27 October.

Horned Lark- A nice fall total of (450) were found in fields adjacent to Cane Ridge FWA on 25 November.

Red-breasted Nuthatch- Aside from a handful of northern Indiana records, this regular irruption species was completely absent from the state this fall.

Blue-gray Gnatcatcher- (20) seen behind the DNR Division of Fish and Wildlife offices in Mitchell was a noteworthy fall total (Amy Kearns).

Gray Catbird- A decent total of (29) were found at Fox Island County Park, Allen Co., by Jim Haw on 20 September. A late bird was also reported on 13 November from Eagle Creek Park.

Snow Bunting- A count of (728), in flocks migrating past Miller Beach on 25 November (Jeff McCoy and Michael Topp), provided the lakefront's fifth largest daily count.

"Brewster's" Warbler - This rare hybrid warbler was seen at Pigeon River FWA by Jim Haw on 13 September.

Worm-eating Warbler - Tim Griffith and Steve Gifford counted (5) at Cane Ridge on a late date of 13 September to provide a new state fall high count.

Prothonotary Warbler - On 8 August, Vern Wilkins recorded a quite noteworthy (20) birds from the North Fork Waterfowl Resting Area, Monroe Co.

SWAINSON'S WARBLER- A possible singleton was located by on 29 September at Eagle Slough, Vanderburgh Co. This record has been submitted to the Indiana Bird Records Committee for review.

Tennessee Warbler- A single bird in Forsythe Park on 22 October was the third latest lakefront record (Ken Brock et al.).

Nashville Warbler- Ken Brock et al. ticked away a (35) birds at multiple sites along the lakefront on 24 September. This count ties the second highest count and breaks the lakefronts highest. John Kendall also logged an incredible (25) along the canal at Forsythe Park on 28 September.

Connecticut Warbler- A dead singleton was located by Don Gorney in downtown Indianapolis on 21 September. Another single bird was located in Floyd Co. on 27 September. The season's final bird was located in Merrillville, Lake Co. on 29 September.

American Redstart- The fall warbler man, John Kendall, again logged (35) birds in the Hammond Bird Sanctuary on 14 September. A late, lingering bird was seen by Michael Topp at the same location on 14 October.

Cape May Warbler- A minimum of (60) birds were recorded at Celery Bog on 20 September, tying the state record count.

Magnolia Warbler- A nice inland count of (35) was logged by Wes Homoya at Celery Bog, Tippecanoe Co., on 27 September. A count of (20) was also logged by John Kendall on 14 September in the Hammond Bird Sanctuary, Lake Co.

Bay-breasted Warbler- A tardy individual was found outside the Indiana Dunes State Park Nature Center on 25 October (Brad Bumgardner).

Blackburnian Warbler- A tally of (20) by Amy Kearns at Monroe Lake on 25 September was the state's second highest ever in the fall.

Blackpoll Warbler- Indiana's fall high count was exceeded on 28 September when (59) were logged at Forsythe Park, quickly followed by (9) more at Hammond Bird Sanctuary (John Kendall) for a total of (68) birds.

Palm Warbler- A sizeable group of (55) birds was found by John Kendall in the Hammond Bird Sanctuary, Lake Co. on 14 September.

Black-throated Green Warbler- A new state record count was logged at Celery Bog on 27 September when (65) were recorded “dripping from the trees” (Wes Homoya). A new second highest state count was then achieved by Matt Hale at Celery Bog the very next day when he counted (50) birds. Suddenly not so noteworthy, but the (25) seen by Amy Kearns at Monroe Lake on 25 September would normally be worth mentioning as well.

Wilson’s Warbler – Brendan Grube pushed up (1) bird in rural Porter Co. on 14 November, providing the state’s second latest date.

Yellow-breasted Chat- A 27 September bird seen at Deam Lake SRA, Clark Co., was pushing the late date expectations (Gerald Heath).

Scarlet Tanager – A lingering bird was found by Terry Ballenger on 14 October in Cool Creek Park, Marion Co.

American Tree Sparrow- A high count of (50) birds were reported from Goose Pond FWA on 25 November (Alan Bruner et al.).

Chipping Sparrow- Many records from the southern half of the state continued through November. These records totaled (50) birds.

Clay-colored Sparrow- In total, (6) individual birds were reported this fall, with all but one being on the Lake Michigan lakefront. This year’s dates ranged from 10 September to 17 October.

Lark Sparrow- A first fall bird found at Eagle Creek Park was noteworthy on 7 August. This represents the park’s second record (Larry Peavler).

Henslow’s Sparrow- a late departing bird on 21 October at Goose Pond FWA was photographed by Michael Brown.

Le Conte’s Sparrow- (15) total birds were reported this season, with records coming from the Lakefront, Goose Pond FWA, and Pine Creek GBHA. The season’s high count was (4) at Goose Pond FWA on 29 October (Lee Sterrenburg et al.).



**Figure 9. LeConte’s Sparrow, 29 Oct 2011, Goose Pond, Greene,
Photo by Michael Brown**

Nelson’s Sparrow- (8) birds were reported in the state this fall. Records primarily came from the Lakefront or Goose Pond FWA. Of note was some high quality photos of a Nelson’s Sparrow found in the Hammond Bird Sanctuary 28 September (John Kendall and Michael Topp) that suggest the bird belonged to the Hudson Bay population.

Fox Sparrow- A Fox Sparrow bonanza was reported 29 October, when (30) birds were recorded along the Ly-co-ki-we trail in the Indiana Dunes National Lakeshore, Porter Co. (Randy Pals).

Swamp Sparrow- A fine count of (86) birds were made at several lakefront sites on 22 October by Randy Pals. This count constitutes the lakefront's largest fall tally.

Harris's Sparrow- This autumn brought the best flight since 2003. The season's first arrival, a singleton, was discovered on the Cowles Bog dike 8 October (Penny Starin). A first-cycle bird was found at the Kemil Road (w. Beverly Shores) lot on 16 October (Brendan J. Grube et al.). The bird was still present the following day. An adult (the lakefront's first in eight years) was discovered at West Beach on 21 October (John C. Kendall). Another first-cycle



Figure 10. Juvenile Harris's Sparrow, 17 Oct 2011 Kemil Road, Indiana Dunes National Lakeshore, Porter, Photo by J.C. Kendall

bird visited the Brock feeder in Chesterton on 26 October (Ken Brock).

White-crowned Sparrow - A good size flock of (89) birds were logged from behind the Hilton Garden Inn in Merrillville on 21 October.

Blue Grosbeak- A lingering bird at Kankakee Sands, Newton Co., on 12 October (Jed Hertz) broke a new state late record.

Indigo Bunting- a tardy female type bird was found in the Gibson Lake area, Gibson Co., on 3 December by Amy and Noah Kearns.

Dickcissel- A lingering bird was found with a mix of sparrows in Merrillville on 28 October.

Yellow-headed Blackbird - An adult female was observed and photographed feeding young at Grant St. Marsh, Lake, 4 August (Penny Starin, John C. Kendall) for a rare breeding record in Northern Indiana.

Brewer's Blackbird- (8) records were recorded throughout the state during the fall period.

Baltimore Oriole- A private feeder hosted a male on 25 and 26 November near Georgetown, Floyd Co.

Purple Finch- A single flock of (35) was recorded over the Green Tower at Indiana Dunes State Park 25 November (John Kendall). This flock was noteworthy given the low to fair showing statewide.

Red Crossbill- The season's first birds arrived 29 October with (2) flying along the lakefront at Marquette Park (Sean Fitzgerald et al.) and two singletons at West Beach (Jeff McCoy et al.). John C. Kendall saw and heard a singleton fly past Marquette Park on 19 November. Crossbills were also reported flying over Crown Point, Lake Co., on 23 November but weren't identified to species (Brendan Grube).

Common Redpoll- A total of (6) was reported for the fall season. The first was seen feeding on sunflowers with goldfinch at Marquette Park on 29 October (Sean Fitzgerald et al.).

Pine Siskin- The season's best count was (60) at Salamonie Reservoir on 22 November (Jim Haw et al.). Also, (48) seen feeding in white cedar trees in Ogden Dunes, Porter Co., on 7 November (John Kendall) was noteworthy.

American Goldfinch- a large count of (1000) was made at Goose Pond FWA on 1 November.



Figure 11. Juvenile Buff-breasted Sandpiper, 13 Sep 2011 Miller Beach, Lake, Photo by Brad Bumgardner

The Hoosier Baypoll Shuffle
Kenneth J. Brock and Randall J. Pals
Chesterton, Indiana

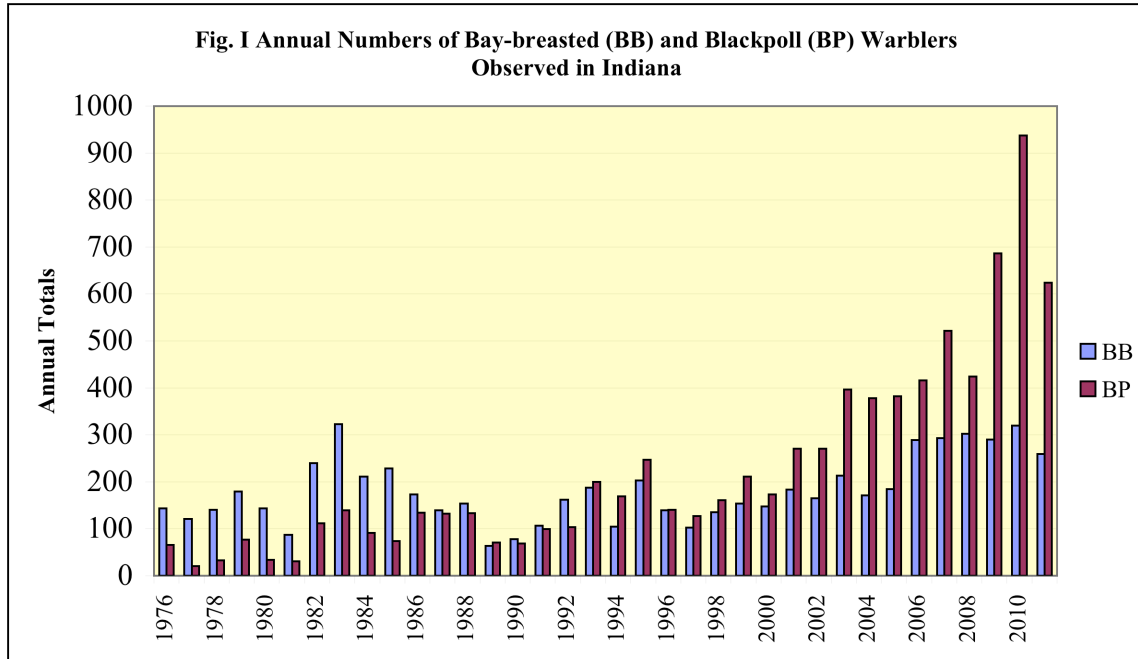
Abstract Examination of 36 years of Indiana observational (birder) data disclosed an acute decline in Bay-breasted Warbler numbers relative to Blackpoll Warblers. Further analysis revealed a statistically significant decline in Bay-breasted Warblers plus an increase in Blackpoll Warblers, both at the 99% confidence level. This treatment illustrates the detection of avian population changes using routine birder observations.

Introduction The Bay-breasted (*Setophaga castanea*) and Blackpoll Warblers (*Setophaga striata*), collectively referred to as “Baypolls,” are common spring and fall migrants through Indiana. However, an examination of reported annual numbers in the state reveals that their relative abundances have changed significantly over the past 36 years.

These two migrants are typical members of the treetop warbler flocks and both species pass through the state at virtually the same time. In spring both species peak about 15 May and zenith of the fall flight is near 16 September. These characteristics suggest that observers have roughly the same probability of finding both species during a given outing.

Analysis Data used to examine these two warbler populations were taken from an Indiana avian database managed by the first author. Although this source includes specimens, banding data, and historical information, it is dominated by modern observational (birder) reports. In recent years the IN-BIRD listserve has provided a majority of the data.

Examination of database records revealed that statistically acceptable annual counts of both warbler species were reported from 1976 through 2011. Annual numbers reported during this interval are graphed in Figure I, which reveals that yearly counts of both warblers, but especially Blackpolls, have increased markedly in recent years. Temporal variations in relative numbers of the two species are also evident in the plot.



To efficiently analyze annual migration numbers it was convenient to convert reported annual totals into a parameter called Fraction-BB (Bay-breasted fraction), which is calculated as follows:

$$\text{Fraction-BB} = \text{BB}/(\text{BB}+\text{BP})$$

In this formulation BB represents Bay-breasted annual numbers and BP is the corresponding values for Blackpoll Warblers. The Fraction-BB parameter varies from 0.0 to 1.0; a value of zero indicates 100% Blackpolls and 1.0 represents 100% Bay-breasted Warblers; a Fraction-BB value of 0.5 denotes equal numbers of both species. A plot of annual Fraction-BB values for the years 1976-2011 is shown in Figure II.

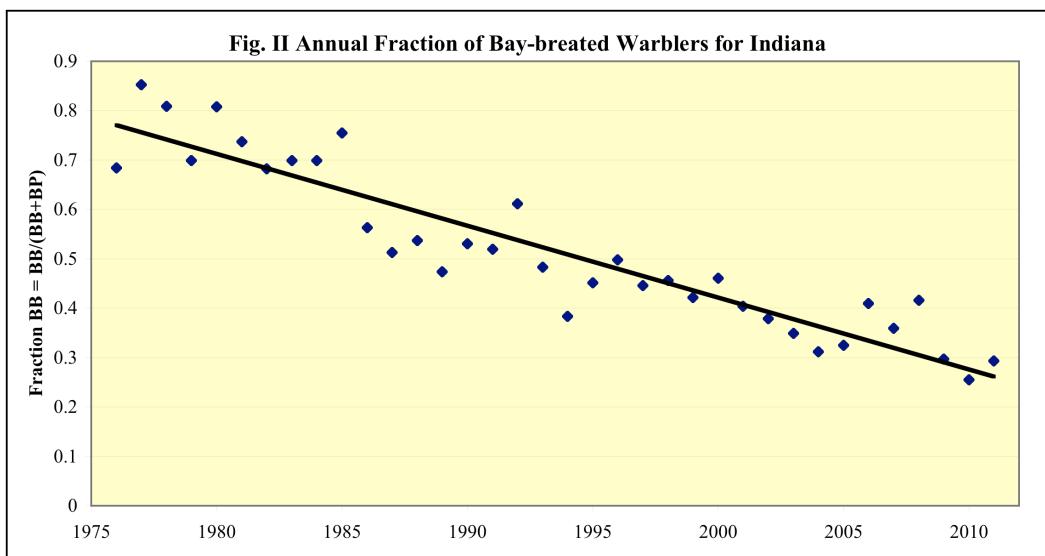
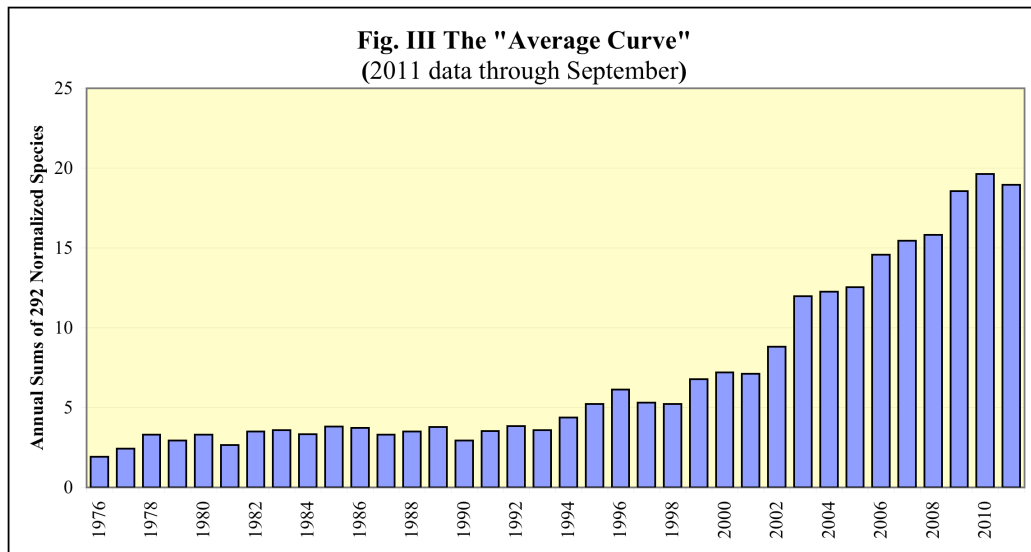


Figure II shows a compelling decline in the Fraction-BB over the 36 years under consideration. The trend line is a least squares fit to the plotted data points. This plot clearly reveals that Bay-breasted Warblers were dominant in the early years and that Blackpolls became the prominent species more recently; the transition occurred about 1995. Thus, observed numbers of the two warblers were approximately equal during the mid-1990s. If the illustrated trend continues unabated, the Fraction-BB parameter will be zero in 2024.

What has changed?_

The trend shown in Figure II raises an important question: which species has changed? The Canadian Breeding Bird Survey reports Bay-breasted Warbler declines over the period under consideration (see website). Williams (2011, revised) reports a statistically significant Bay-breasted decline for Canada (where 98 percent of Bay-breasted Warblers breed) during the period 1970-2009. These sources suggest that the decline shown in Figure II can be attributed to a dwindling Bay-breasted population; however, at least a portion of this decrease might also be attributed to an increase in Blackpoll Warbler numbers. To examine this possibility a more detailed examination of the Indiana data was conducted.

Over the years Indiana observer effort has increased significantly; consequently, it is impossible to directly assess population changes using the annual count totals shown in Figure I. To address this problem a technique used in Brock (2006) was employed (see that reference for additional details about this method). This approach involves comparing annual counts of these two warblers with normalized annual counts of 292 Indiana avian species: 140 passerines and 152 non-passerines. A composite plot of these 292 normalized species is called the “Average Curve” and is shown in Figure III.



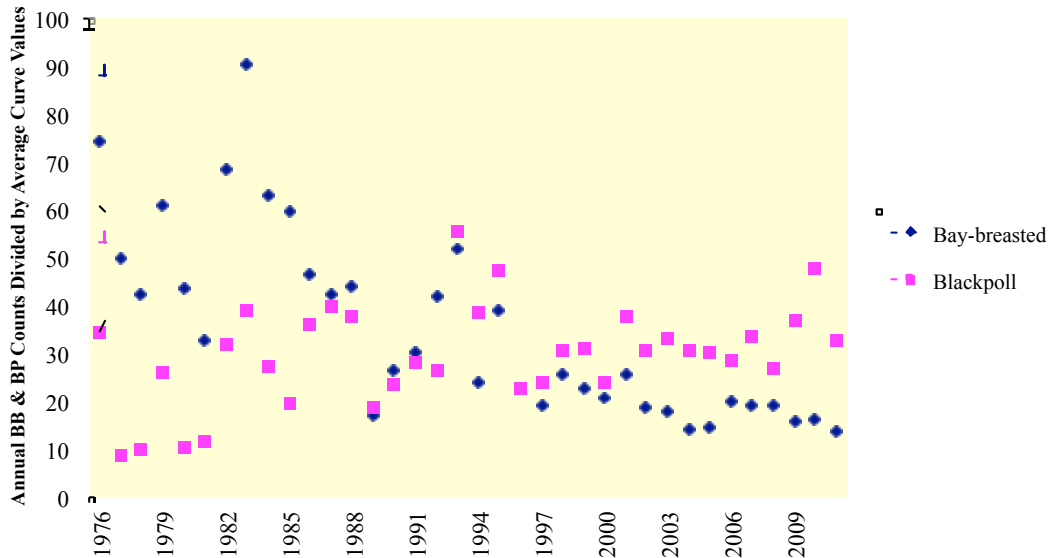
If, despite the waxing and waning of individual bird populations, Indiana’s entire avifauna remained more or less constant over the past 36 years, the “Average Curve” provides a method for detecting trends in Indiana’s avifauna. For example, if all of the 292 bird populations used to calculate the “Average Curve” were perfectly stable and the observational effort constant, all bars in Figure III would have the same height, yielding a flat plot. In reality however, variations in observational effort have created an obvious increase in the normalized annual values. Thus, for any single species dividing each annual total of that species by corresponding value from the “Average Curve” can mitigate the observational effort. This procedure was employed to compensate for observational effort for both warbler species. Even if the constant avifauna assumption is not valid, the trend line for any individual species still provides a trend

relative to Indiana's average avifauna.

The application of this treatment to the warblers under consideration is shown in Figure IV.

□

Fig. IV. Corrected Normalized Annual Baypoll Warbler Counts for Indiana



The trend lines in Figure IV clearly reveal that Bay-breasted Warblers have declined, but also suggest that Blackpoll numbers have increased. In both cases the scatter of annual data points decreased after about 1998, the year that the IN-BIRD LISTSERVE became operational, thereby providing the availability of far more data.

The slope of the Bay-breasted regression line in Figure IV is -1.48 whereas, slope of the Blackpoll regression line is +0.40 (both in units of “corrected normalized” birds/year). Both slopes are statistically significant at the 99% confidence level. That is, we can say with 99% confidence that the Bay-breasted declined over the study period (i.e. the Bay-breasted slope is negative), and that Blackpolls increased over the study period (i.e. the Blackpoll slope is positive). Furthermore, we can put a confidence interval on the slopes of the regression lines. We can say with 95% confidence that the Bay-breasted slope is between -1.10 and -1.86, and that the Blackpoll slope is between 0.10 and 0.70.

Conclusion

This analysis reveals that Indiana field observations document not only a statistically significant decline in Bay-breasted Warblers, but also an increase in Blackpoll Warbler numbers. These trends are both significant at the 99% confidence level. As both species are simply spring and fall transients through the state, these observational data provide no information about the cause, or causes, of these changes. It does, however, illustrate the great value of employing birder's field data to detect population changes of migrant birds.

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Status of Nelson's Sparrow Subspecies in Indiana

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Introduction

On 28 September, 2011, the author was searching a tiny but notorious patch of bluestem grass in the Hammond Bird Sanctuary for pale-rumped *Ammodramus* Sparrows, hoping to see LeConte's or Nelson's Sparrow. Although a candidate sparrow flushed with a short, weak flight; the bird gave an immediate impression of appearing rather dull for Nelson's Sparrow. Binocular views revealed a yellow-orange facial pattern and lack of narrow median crown stripe, amongst other field marks that indicated this was a Nelson's Sparrow. Notably missing was the typical contrast between black-centered scapulars and strongly contrasting white edges that seem to be found in typical Nelson's Sparrows seen in migration in Indiana.

Fortunately, the bird allowed fairly close approach and photographs were obtained. Indeed, the photos (Figures 2 and 3) confirmed the initial perception, revealing a fairly dull Nelson's Sparrow, highlighted by pale gray-edged scapulars and blurry, light brown flank streaking. However, this Nelson's was not as dull gray or long-billed shown as the "Atlantic" Nelson's Sparrow subspecies shown in some field guides. The subtle, but odd differences in this intermediate plumage were discussed with other Indiana birders and the matter was tabled for the meantime.

Conveniently, ten days after this sighting, the author opened up his copy of North American Birds and immediately located an article by Smith regarding subspecies of Nelson's Sparrow. The article regarding Saltmarsh and Nelson's Sparrow subspecies identification illustrates field-observable morphology that separate the three subspecies. Since there is no documentation as to subspecies made in Indiana, a discussion follows of characteristics that can be used for separating the two interior-breeding subspecies; the nominate nelson subspecies (*A.nelsoni nelson*) from the intermediate alterus subspecies of Nelson's Sparrow (*A.nelsoni alterus*).

Tips for identifying Nelson's Sparrow subspecies

Prior to recent papers, including Smith's, the distribution of the two interior North American Nelson's Sparrow subspecies was relatively unknown outside of their respective breeding ranges. *A.nelsoni.nelsoni*, the nominate Nelson's Sparrow subspecies, breeds in the northern prairies, while the duller *A.nelsoni.alterus* breeds near Hudson Bay (most notably along James Bay) area. The subtle differences in plumage that distinguish these two subspecies require very careful examination, most likely requiring high quality photographs at various angles in order to evaluate all four of the key identification points that are summarized below in Table 1. As indicated in Smith's article, significant variation occurs within each of these two subspecies. Some birds will show characteristics that are intermediate between weak and strong-contrasting. Even under ideal conditions, many birds may not be separable as to subspecies. Smith shows that under ideal conditions (excellent digital photographs or bird in hand); many of the more typical individuals can be separated. The suggested convention in Smith's North American Birds article is to only accept clear-cut records of *A.a.alterus* and identify birds

with characteristics split between the two as *nelson/alterus*. In birder's favor is researchers' conclusion that molt cycle does not appear to change the distinguishing field marks for separation of these two in various seasons.

Following Smith's terminology, four major field identification characteristics of each subspecies are presented in tabular form for easy reference:

Table 1. Separating typical individuals of Nelson's Sparrow interior subspecies

Subspecies	<i>nelsoni</i> (<i>A.nelsoni.nelsoni</i>)	<i>alterus</i> (<i>A.nelsoni.alterus</i>)
Scapular pattern	Black-centered with bright buffy to white edges	Gray-brown or gray with pale edges
Crown	Narrow gray median stripe, featuring blackish streaks in lateral crown stripe	Gray, median crown stripe, particularly broader (vs. Nelsoni) in anterior portion
Auriculars	Gray suffused with ochre from facial triangle	Pure gray in most definitive birds
Flank streaks*	Crisp, rufous-brown (dark, thin)	Blurry, gray-brown (light, broad)

*Beware of fluffed birds appearing to have blurry streaks

Status of Nelson's Sparrow subspecies' in Indiana

Upon reading the North American Birds photo-essay, it was felt that the Hammond bird fit well with descriptions and photos of *alterus* subspecies of Nelson's Sparrow and was tentatively identified as *A. nelson.alterus*. Furthermore, no documented record could be located for this subspecies in Indiana.

Fletcher Smith, author of the North American Birds article was contacted, and stated "all in all, *A. nelson.alterus* looks good [for this bird]" noting "a weakly marked dorsum-lacking black centers on the scapulars, muted and blurry side streaking. The crown was judged to have fine black streaking, not splotchy black throughout the crown. The median crown stripe appeared to be totally gray, with no black infused at all. One caveat was that the crown was not photographed well, particularly, the posterior portion.

It appears both interior-breeding Nelson's Sparrow subspecies probably do pass through Indiana. It also seems likely that the Hammond bird is perhaps a first documented *alterus* subspecies for the state.

A quick review of a handful of adequately photographed Indiana records of Nelson's Sparrows seems to indicate that the nominate *nelson* subspecies predominates (at least 4 identifiable *nelson* to 1 *alterus*). However, such a conclusion is statistically premature, as more photographic records are needed. Winter distribution has largely been worked out by Greenlaw and Woofenden, as indicated in the North American Birds photo-essay.

Smith (pers. comm.) indicates interest in migratory records from Indiana and points out that learning the migration paths of the subspecies is the researcher's next step.



Figure 1. Figures 1&2: *A.Nelsoni.alterus*, 28 Sep 2011, Lake, Hammond Sanctuary Photos by J.C. Kendall



Figure 2. Note the pale scapulars and edges (vs. white for *A.Nelsoni.nelsoni*), blurry brown flank streaks, and pure gray auriculars. Even at this poor angle, which should marginalize the gray crown patch width, note that front portion of the crown appears to be well separated from the lateral dark brown stripes (compare to Figures 3 & 4 below.)



Figure 3. Figures 3&4: *A. Nelsoni.nelsoni* Goose Pond, *Greene*, 21 Oct 2011. Note the contrasting white edges to dark scapulars, thin gray frontal portion of the crown and dark, crisp flank streaking. Photos by Michael Brown



Figure 4. Details of crown. Anterior (bill side) of gray crown patch is very narrow, nearly occluded by the dark brown lateral crown stripes



Figure 5. Another typically bright and contrasting probable *A. Nelsoni.nelsoni* bird 13 Oct 2011, McCool Basin, Porter, Photo by J.C. Kendall

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PREY OF INDIANA PEREGRINE FALCONS DURING THE 2011 NESTING SEASON

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Once extirpated from Indiana, the Peregrine Falcon (*Falco peregrinus*) population is currently doing well in the state and elsewhere. Since 2000, there have been 8-12 successful nests annually in Indiana. In 2011, 11 successful nests produced 28 chicks (Castrale 2011). These chicks were banded 23 May – 30 June, and their nest boxes cleaned of debris. This debris was later examined and the remains of prey species identified in order to better understand the food habits of nesting Indiana Peregrine Falcons.

Study Sites and Methods

Before returning banded Peregrine Falcon chicks to seven nest sites, debris from the sites was collected for later analysis. At the other four nest sites with chicks there was very little or no debris present. The seven nest sites with debris are distributed throughout the state, with two sites on Lake Michigan, three sites in large inland cities, and two sites along major rivers (Figure 1). The nests were all located in specially built falcon nest boxes, with four on power plant smoke stacks, two on tall office buildings, and one on an industrial building. Areas adjacent to each nest site are open, urban or industrial, with few trees. Four of the nest sites have large bodies of water within view, and all seven sites are within two miles of a major lake or river (Lake Michigan, St. Joseph River, Kankakee River, West Fork White River, and the Ohio River).

Prey remains were sorted and identified with the help of Pyle (2008), Scott and McFarland (2010), and Sibley (2003). Other sources consulted were Cornell Lab of Ornithology's *Birds of North America Online*, internet image searches for birds in flight or in the hand, comparison with Purdue University's specimen collection, suggestions from ornithologists, and the author's own experience observing birds. Feather lengths were measured and color, shape, and unique features noted. When an entire wing was available, wing chord was taken. Bill length and width were measured and any attached feathers noted; exposed culmen was measured when possible. Tarsus and toes were measured and foot morphology noted; particular attention was paid to the hind toes and toe webbing of shorebird legs.

Results

Forty-four bird species were identified from prey remains, plus an additional three taxa in which species could not be determined (Table 1). The five most common species found were Rock Pigeon, Yellow-billed Cuckoo, Blue Jay, Cedar Waxwing and Common Grackle. Rock Pigeon and Yellow-billed Cuckoo remains were found at all seven sites where remains were collected. Twenty-six prey species (59%) were encountered at more than one site, while 18 prey species (41%) were found at single sites.

Discussion

Peregrine Falcons are opportunistic predators. In North America, at least 429 bird species, plus small mammals, insects, amphibians, and fish, have been recorded as prey (White et al. 2002). Peregrines usually prey on birds weighing 50-500 grams, but prey ranges in size from small geese to hummingbirds (White et al. 2002). The largest species identified in this study was Ring-billed Gull (approximate live weight 520 grams) (Ryder 1993); the smallest was American Redstart (approximate live weight 8 grams) (Sherry et al. 1997). Pigeons and doves typically make up a high percentage of peregrine diets (Ratcliffe 1993) and this study found nesting Indiana peregrines to be no exception (Table 2). Peregrine Falcons in Indiana nest along major lakes and rivers, which are common pathways used by migratory birds. Many of the prey species identified in this study are migrants through peregrine territory and are not available as prey year-round. The majority of identified prey were likely taken between 28 April and 13 June (the period between the first eggs hatching at collection sites and the latest date that prey remains were collected), which is a time period in Indiana featuring very high numbers of migrating birds. Urban peregrines in Indiana may take advantage of birds drawn to bright city lights while migrating at night, preying on these disorientated or injured migrants in the early morning and evening hours. Peregrines in New York City have been observed hunting migratory birds at night (DeCandido 2006) and Milwaukee peregrines are believed to hunt nocturnally (Wendt et al. 1991). More study is needed to understand the relationship between migrating birds, urban night lighting, and Indiana's nesting Peregrine Falcons.

The 44 species identified in this study are similar to prey remains analyzed from three Indiana Peregrine Falcon nest boxes in 1996 by Al Parker of the Indiana Division of Fish and Wildlife (Parker 1996). He found 21 species in the remains collected from nest sites in Porter, Fort Wayne and Indianapolis. At all three nest sites Parker found the remains of four species (Rock Pigeon, Mourning Dove, Yellow-billed Cuckoo and Common Nighthawk). At two out of three sites he found two additional species (Chimney Swift and Blue Jay). These six species were also identified in the prey remains from this study; however, Mourning Dove, Common Nighthawk and Chimney Swift were present at a lower percentage of nest sites. These differences are not surprising and could be caused by a number of factors including sample size, nest location, individual hunting preferences of adult peregrines, and author bias in species identification.

The volume of prey remains collected was extremely variable from site to site. This is probably due, in part, to differences in the plucking habits of adult peregrines. It is likely that peregrines habitually plucking their prey before delivering it to the nest site would accumulate less prey remains at the nest site than peregrines delivering whole or partially feathered prey. Wind exposure also likely plays a role in the volume of prey remains found at nest sites, as well as the design and placement of individual nest boxes. For this study, the volume of remains collected at each site was indexed from 1-5, with 5 being the largest volume (approximately 1.5 liters) and 1 being the smallest volume (approximately 0.25 liters). Not surprisingly, the volume of prey remains correlated positively with the diversity of prey species identified (Figure 2).

No attempts were made to quantify individual prey items or the biomass percentage representing each prey species. This could not be done accurately without investing considerably more time and effort (i.e. identifying every feather to species and individual). In addition, this would not necessarily yield more meaningful results, as the amount of remains from a species may not accurately reflect the number of individuals taken or the percentage of the diet represented by that species. These types of analyses are better suited to situations in which the entire prey animal can be observed and tallied.

Identifying prey species by their scattered remains is challenging. Remains were usually tattered, broken, or defecated on by nestlings. Prey species were often identified based on a single feather, leg, or half of a bill. Identifications were biased toward prey with colorful or unique feathers. Feathers with a pattern were usually more identifiable than solid-colored feathers. Larger feathers were harder to overlook than tiny feathers. Not every feather collected was identified. Rectrices and remiges (especially the primaries) were usually better clues to species identification than body feathers. Bills, legs, heads and wings were very good clues and almost always identified to species.

Conclusion

Nesting Peregrine Falcons in Indiana are opportunistic predators, taking a wide variety of avian prey. Many of these prey species can be identified by their remains, collected when nest boxes are cleaned of debris. Although identifying species by their scattered remains is challenging, 44 species plus three additional taxa were identified in the prey remains collected from seven Indiana Peregrine nest sites during the 2011 season.

Acknowledgments

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Table 1. Prey Remains of Nesting Indiana Peregrines by Occurrence and Type

Species	Nest Location ¹						
	EC	MC	SB	WH	IP	IM	NA
Rock Pigeon	F ²	F	F	F	F	F	F
Yellow-billed Cuckoo	F	F	BF	BF	F	F	F
Blue Jay	F	F	F	HF		HF	BF
Cedar Waxwing		F		F	F	F	F
Common Grackle	F	F		F		HF	F
Killdeer		F		L	F		F
Black-billed Cuckoo	B	F			F	F	
Northern Flicker		F	F			F	F
European Starling	B	B	F			F	
Red-winged Blackbird	F	BF	F			BF	
Eastern Meadowlark	F	F		BF			F
Wilson's Snipe	F		F			F	
American Woodcock	FL	BF				BF	
unidentified shorebird	F			F			F
Chimney Swift				F		F	F
American Robin		F		F		B	
unidentified sparrow	F			F			F
Scarlet Tanager	F	F				F	
Northern Cardinal			B			BF	F
Rose-breasted Grosbeak		F		F		F	
Baltimore Oriole		F	F			F	
Mourning Dove						F	F
Red-headed Woodpecker		F					B
Eastern Bluebird		F		F			
Magnolia Warbler		F		F			
unidentified warbler	H	HF					
Brown-headed Cowbird				F			F
Orchard Oriole	F	F					
House Sparrow					F		F
Least Bittern						B	
Green Heron						B	
Sora						FL	
Black-bellied Plover				L			
Solitary Sandpiper	L						
Greater Yellowlegs		F					
Ring-billed Gull				F			

Table 1 (cont.). Prey Remains of Nesting Indiana Peregrines by Occurrence and Type

Species	Nest Location ¹						
	EC	MC	SB	WH	IP	IM	NA
Common Nighthawk						F	
Red-bellied Woodpecker							F
Great-crested Flycatcher		B					
Eastern Kingbird	F						
Tree Swallow	F						
Barn Swallow							F
American Redstart	F						
Yellow Warbler						F	
Yellow-breasted Chat			F				
Summer Tanager							F
Bobolink		F					

B-Bill, F-Feather, H-Head, L-Leg

EC (East Chicago), MC (Michigan City), SB (South Bend), WH (Wheatfield), NA (New Albany), IP (Indianapolis Power & Light), IM (Indianapolis Market Tower)

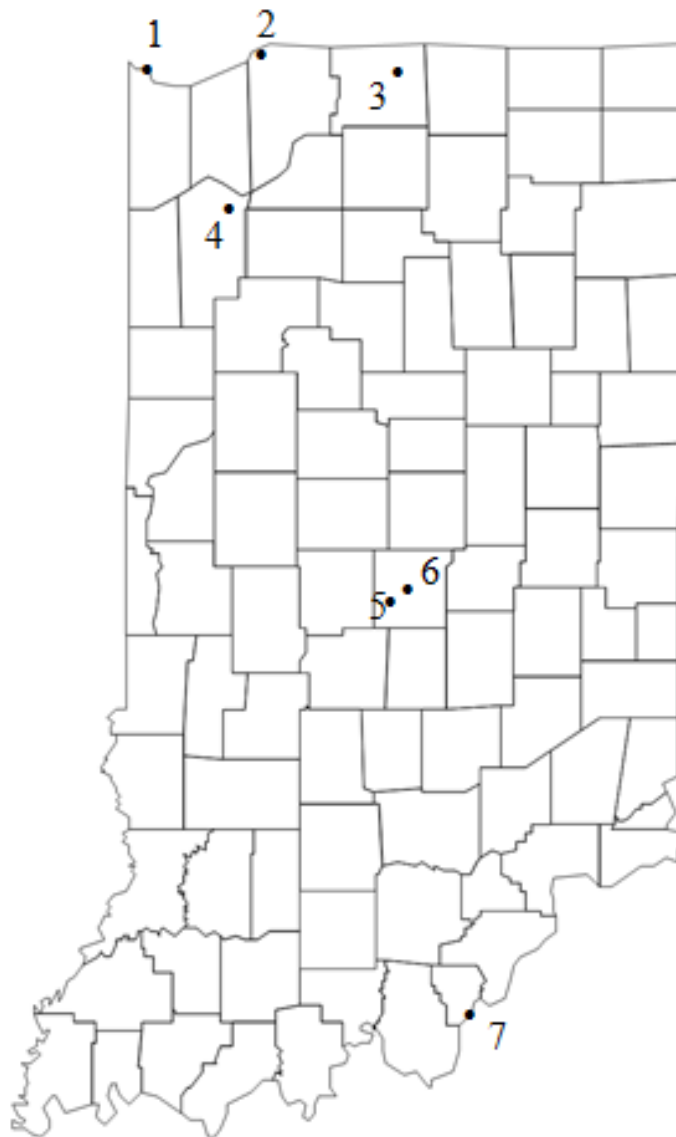


Figure 1. Locations where prey remains were collected from Peregrine Falcon nest boxes.

- 1 – East Chicago
- 2 – Michigan City
- 3 – South Bend
- 4 – Wheatfield
- 5 – Indianapolis Power & Light
- 6 – Indianapolis Market Tower
- 7 – New Albany

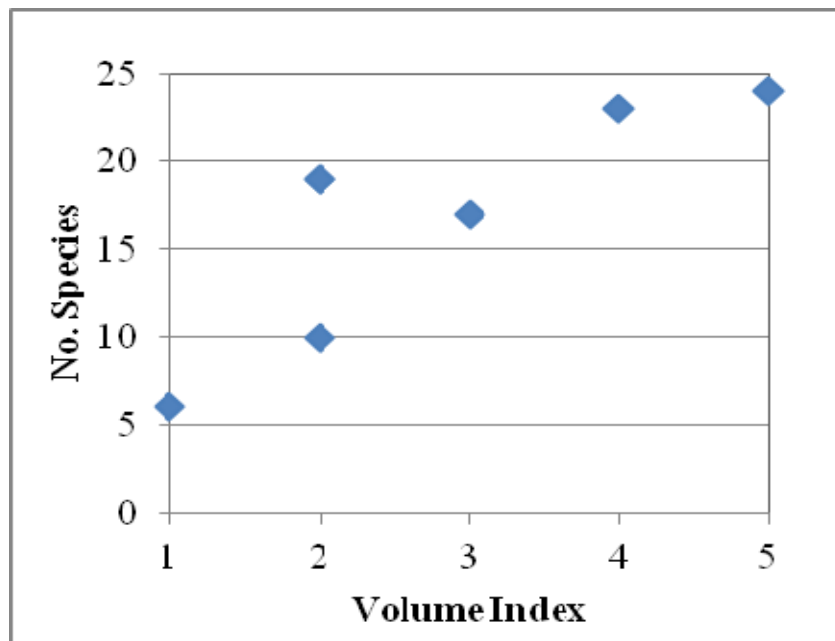


Figure 2. Species diversity by volume of prey remains

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1 – Indianapolis Power & Light ~0.25 liters

2 – East Chicago, South Bend, New Albany ~0.5 liters

3 – Wheatfield ~.75 liter

4 – Indianapolis Market Tower ~1 liter

5 – Michigan City ~1.5 liters

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