Nesting of American White Pelicans in Lake Erie, 2019

D.V. Chip Weseloh, Adam Byrne, Doug Crump, David J. Moore and James P. Ludwig

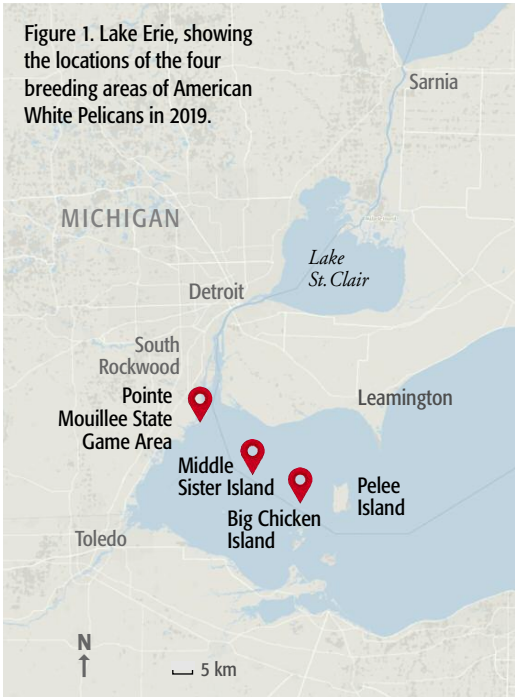


Figure 1. Lake Erie, showing the locations of the four breeding areas of American White Pelicans in 2019.

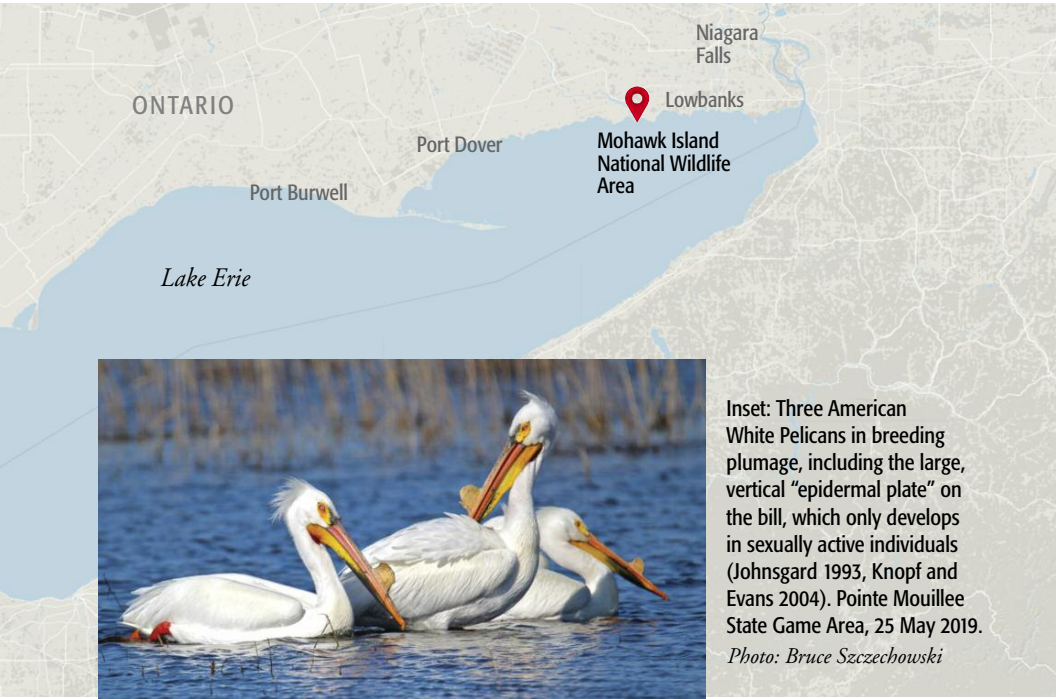
Summary

The first two nesting sites of American White Pelicans in the lower Great Lakes were discovered in the Canadian waters of western Lake Erie in 2016 and monitored during 2016-2018. They both showed an increased number of nests and fledglings in 2019. Two new nesting sites were discovered in Lake Erie in 2019: a site at the Mohawk Island National Wildlife Area, near Lowbanks, Ontario, in eastern Lake Erie, where a single nest with two eggs was found but later abandoned, and a site at the Pointe Mouillee State Game Area, near South Rockwood, Michigan, in western Lake Erie, where two nests produced two young. The increased nesting activity of American White Pelicans in Lake Erie in the last four years should alert field observers to watch for additional nesting activity of this species anywhere in the eastern Great Lakes area.

Introduction

American White Pelicans (*Pelecanus erythrorhynchos*) (henceforth pelicans) first nested in Lake Erie in 2016 (Tymstra *et al.* 2019) on two islands in the western basin: Big Chicken Island (41.77°N, 82.82°W) and Middle Sister Island (41.84°N, 83.00°W). They also nested on Big Chicken Island in 2017 but, unfortunately, the island was not visited in 2018, so their status for that year is unknown. On Middle Sister Island, pelicans were noted nesting in 2016-2018 (Tymstra *et al.* 2019).

One of the objectives of this article is to document the status of nesting of pelicans on those two islands in 2019. In addition, we report on pelican nesting activities at the Mohawk Island National



Inset: Three American White Pelicans in breeding plumage, including the large, vertical "epidermal plate" on the bill, which only develops in sexually active individuals (Johnsgard 1993, Knopf and Evans 2004). Pointe Mouillee State Game Area, 25 May 2019. *Photo: Bruce Szczechowski*

Wildlife Area, Ontario, and the Pointe Mouillee State Game Area, Michigan, two additional sites in Lake Erie where pelicans nested for the first time in 2019.

Methods

As with the two nesting sites discovered in 2016, the nesting on Mohawk Island was discovered while conducting fieldwork for toxicology studies on Herring Gulls (*Larus argentatus*) and Double-crested Cormorants (*Phalacrocorax auritus*). The nesting at Pointe Mouillee was discovered as a result of observations of intense activity of pelicans in suitable nesting habitat. Mohawk Island National Wildlife Area (42.83°N, 79.52°W) is located in the eastern basin of Lake Erie approximately 4 km southwest of Lowbanks, Haldimand County, Ontario. Pointe Mouillee State Game Area (42.01°N, 83.19°W) is located at the extreme western end of Lake Erie, 8 km southeast of South Rockwood, Monroe County, Michigan (Figure 1).

Observations

Mohawk Island

While visiting Mohawk Island (Figure 2) on 29 April 2019, DC and Kim Williams found a single pelican nest located between the main Herring Gull colony and the cormorant nesting area, near the top of a large knoll on the northeast portion of the island. No adult pelicans were observed in the vicinity but the

Figure 2. Mohawk Island, looking south from the top of the knoll. 18 June 2009. *Photo: Laura King*

characteristically minimal nest contained two distinctive large white pelican eggs (Figure 3). On 6 May, the same observers noted only one egg remained and it was very cold and presumably abandoned; there were no adult pelicans observed on this visit either.

Pointe Mouillee

At Pointe Mouillee, three pelicans were first reported on 20 April 2019, with numbers building to over 60 individuals by the end of the month. Near the beginning of May, a subset of these birds started to frequent a small island in the south end of the Vermet Unit of this large diked wetland complex (Figure 4). Breeding was suspected, but it was not confirmed until 27 May, when Bruce Szczechowski photographed pelicans

Opposite: Figure 3. The two-egg nest of American White Pelican on Mohawk Island, 29 April 2019. For comparison, the red field book measures approximately 10.6 cm x 17.1 cm.
Photo: Doug Crump


2008
FIELD
WORK - BOOK
2019
CARNET DE
TRAVAIL

Figure 4. Pointe Mouillee State Game Area, showing the Vermet Unit and the small island (circle) on which the pelicans nested in 2019. *Google Earth 2020*

sitting on two raised nests (Figure 5) and a young chick on 26 June (Figure 6). On 29 June 2019, adults were observed tending to two small, flightless young. By mid-August, each pair had one large chick still present on the small island. The maximum productivity, as assessed from photographs, was 2 chicks (1.0 yg/nest; n=2 nests).

Middle Sister Island

On Middle Sister Island on 30 April 2019, JPL found two nesting areas (pods) of pelicans. The first pod, at the east end of the island, had 15 nests (14 two-egg nests and 1 one-egg nest); the second pod, more westerly towards the interior of the island, had 27 nests (13 two-egg nests, 4 one-egg nests and 10 zero-egg nests). Hence, a total of 42 nests.

He noted 72 adult pelicans sitting offshore in the water.

JPL returned to Middle Sister Island on 21 May and counted 18 nests in the eastern pod and 48 nests in the interior pod. Most of the eggs in the eastern pod had hatched and 14 small young were present; the oldest young were about two weeks old. In the interior pod, no eggs had yet hatched. The two pods together accounted for 66 nests with eggs or young. DC visited the island on 19 June and noted 20 pelican chicks. DJM visited the island on 18 July; he flushed 27 pelicans, could only distinguish four old pelican nests and found one young pre-fledged pelican. Most pelicans had already left the island. The maximum productivity was 20 chicks (0.3 yg/nest; n=66 nests).

Big Chicken Island

At Big Chicken Island on 7 May 2019, DC did not find any pelican nests and noted only one pelican fly off the island. Nearly six weeks later on 18 June, he noted 30 nests (5 two-egg nests, 3 one-egg nests and 22 zero-egg nests) and between 80 and 120 adult pelicans. DJM visited the island on 18 July (a month later) and noted 61 pelican nests (1 one chick nest, 4 one-egg + one-chick,

Figure 5. The small dirt island in the Vermet Unit wetland showing two apparently adult American White Pelicans sitting on slightly elevated nests incubating eggs or brooding small young, 27 May 2019. *Photo: Bruce Szszechowski*

Figure 6. A young American White Pelican chick (in circle, facing obliquely to the right), approximately one week old and flanked by breeding adults in supplemental (chick-feeding-adult) plumage and by adult Double-crested Cormorants (black birds). Cormorants did not nest on the island. 26 June 2019. *Photo: Bruce Szczechowski*

3 three-egg nests, 23 two-egg nests, 19 one-egg nests and 11 zero-egg nests). He counted 87 adults as they flushed from the island. Dean Robillard, a private boat captain from Pelee Island, drove by Big Chicken Island several times during the summer of 2019. He first noticed six pelican chicks on 2 July and on his last trip, 12 September, noted 12 large chicks (R. Tymstra, pers. comm.). The maximum productivity was 12 chicks (0.2 yg/nest; n=61 nests).

Discussion

The changes in the nesting activity of the pelicans on Big Chicken and Middle Sister Islands between 2016 and 2019 are dramatic (Table 1). The total number of nests on the two islands increased from a minimum of 44 to 127. The number of known eggs went from 30 to 138 and the number of pre-fledged young went from 0 to 32. The numbers of adult pelicans at each site in each year are not as well characterized. Numbers from Big Chicken (2016) and Middle Sister (2017) combined were 155 compared to 159 in 2019. Therefore, the number of adult pelicans between 2016-17 and 2019 appears to have not changed, suggesting a stable adult population; perhaps the same adults are returning to the two islands annually. Although the research visits to these two islands during 2016-2019

Table 1. Maximum number of nests, eggs, adults and chicks of American White Pelicans found at Big Chicken and Middle Sister islands, 2016-2019 and at Pointe Mouillee State Game Area and Mohawk Island, 2019.

Data for 2016-2018 are from Tymstra *et al.* 2019; data for 2019 are from this study.

+ = At least this many, ND = no data

LOCATION	2016	2017	2018	2019
Big Chicken Island				
Nests	20	6+	ND	61
Eggs	6	ND	ND	79
Adults	105	35+	ND	87
Chicks	0	10+	ND	12
Middle Sister Island				
Nests	24	34	30	66
Eggs	24	24*	4	59
Adults	0	50*	ND	72
Chicks	0	Dead	ND	20
Pointe Mouillee SGA				
Nests	Not known to nest here			4
Eggs				2+
Adults				60+
Chicks				2
Mohawk Island				
Nests	Not known to nest here			1
Eggs				2
Adults				0
Chicks				0

*D.Crump, *in litt.*

were not timed to maximize the counts of nests, eggs or adults, the productivity metrics (number of nests, eggs and chicks) appear to have increased considerably on both islands. Also, although the combined number of pelican chicks known to have been produced at the two older colonies was low (0.25 chicks/nest) (see above), both colonies did successfully produce chicks in 2019. Productivity at pelican colonies is known to be highly variable, fluctuating from zero (total reproductive failure) to 1.48 pre-fledged young/nest (Knopf and Evans 2004, Madden and Restani 2005, Van Spall *et al.* 2005).

The number of pelican nests on the two new colonies, i.e., Mohawk Island and Pointe Mouillee, was much lower than the initial numbers on Big Chicken and Middle Sister Islands when they were discovered. Perhaps the flocks of pelicans that "pioneered" the two new sites were much smaller than those which discovered the two older sites. Alternatively, the habitat at these new sites may not be as suitable as that at the older sites. Mohawk Island is most similar to Big Chicken Island and is composed of solid limestone bedrock (as opposed to total cobblestone on Big Chicken), is slightly larger than Big Chicken Island and has a large noticeable soil and rocky knoll, presumably formed by pressure from wind-driven ice in the winter.There are often large accumulations of Zebra Mussel (*Dreissena polymorpha*) shells on the east side of the island. Both Mohawk and Big Chicken Islands have little or no vegetation. Double-crested Cormorants, Ring-billed Gulls (*L. delawarensis*), Herring Gulls and Caspian Terns (*Hydropogne caspia*)

usually nest on Mohawk Island annually and Common Terns (*Sterna hirundo*) occasionally nest there (Blokpoel and Tessier 1996, Canadian Wildlife Service, unpubl. data). Big Chicken Island usually only has Herring Gulls nesting on it, though cormorants nested there in the 1970s (Blokpoel and Tessier 1996) and early 1980s and currently use it only as a loafing area (DVCW, unpubl. data).

Pointe Mouillee State Game Area, the site of the other new colony, is very large; it is a 1,618 ha (4,000 acres, 16.2 km^2) complex of natural and constructed marsh ponds and diked paths. The pelicans nested on a relatively small dirt island in one of eight medium to large shallow impounded wetland units (the Vermet Unit, 372 ha) heavily overgrown with cattails (*Typhus* sp.). This small dirt island in a large impounded wetland, surrounded by cattails, is totally unlike the other three sites: Middle Sister Island is much larger and heavily forested, severely reducing visibility to the horizon; Big Chicken and Mohawk Islands are also relatively larger than the dirt island but are treeless with no emergent vegetation and have unlimited visibility to the horizon. There were no other colonial waterbirds nesting on the small dirt island; it was probably too small, but others have nested, and do nest, in the wetland complex.There are published records of Great Egrets (*Ardea alba*) Great Blue Herons (*A. herodias*), Black-crowned Night-Herons (*Nycticorax nycticorax*) and Herring Gulls nesting at Pointe Mouillee prior to and during surveys in 2007-2010 (Cuthbert and Wires 2013). Great Blue Herons nested there after the 2010 surveys but the exact years were not noted; Great Egrets nested as recently as 2014 and night-herons, Herring Gulls and Forster's Tern (*Sterna forsteri*) nested there in 2019 (A. Byrne, pers. obs.).

Table 2. Egg dates for American White Pelicans at four colony sites in Lake Erie, 2016-2019. Data for 2016-2018 are from Tymstra *et al.* 2019; data for 2019 are from this study.

DATE	NESTING STAGE
Big Chicken Island	
19 July 2016	Nests with eggs
31 July 2017	Incubating eggs or young
18 June 2019	Nests with eggs
Middle Sister Island	
25 April 2017	Nests with eggs
30 April 2019	Nests with eggs
Pointe Mouillee	
27 May 2019	Incubating eggs or young
Mohawk Island	
29 April 2019	Nest with eggs

There is an interesting difference in the nesting phenology of the pelicans at these four nesting areas, even though two of the areas have only been active for one year each and have only had one or two nests. The pelicans at Middle Sister Island, Mohawk Island and Pointe Mouillee have all had eggs relatively early in the season, in April or May (Table 2). Pelicans nesting on Big Chicken Island, however, have only had eggs much later in the season, in June or July (Table 2). Given that the nesting

efforts of pelicans on Middle Sister Island failed in both 2016 and 2017 and the adults subsequently abandoned the island, it is plausible that these birds simply moved to Big Chicken Island and undertook a second nesting. This would explain the late egg dates on Big Chicken Island in both of those years. However, this explanation is not valid for 2019 when pelicans did not abandon Middle Sister Island and the egg dates on Big Chicken Island were relatively late again. One possibility for the different timings might be the timing of the availability of whatever species of fish the pelicans are foraging on at or near their nesting site. Many fish school and spawn as a function of water temperatures (Wismer and Christie 1987, and references therein) which are probably quite different at different places in Lake Erie at the same moment in time. Shallower areas may have spawning at rather different times than sites surrounded by deeper waters. However, pelicans are known to range over large distances to feed, greater than 320 km round trip (Madden and Restoni 2005), and there may not be much temperature variation in offshore waters among the closely juxtaposed islands in the shallow western basin of Lake Erie.

The development of four pelican nesting colonies with three of them having successful nesting attempts in Lake Erie over the past four years, indicates that suitable habitat of sufficient quality for nesting exists. Colonial waterbird researchers in the eastern Great Lakes should be on the lookout for pelicans nesting at other sites on Lake Erie, and/or new sites on Lakes Huron and Ontario and any other suitable areas to the east. As a final thought, we would ask any researchers who visit these Lake Erie pelican colonies, to opportunistically collect regurgitated food pellets from pelicans; these might help us resolve the differential phenology question.

Acknowledgements

We would like to thank to Kim Williams for field assistance to DC, Jeff Costa, Jaimie Bortolotti, Samuel Ross, Jade Bassler and Olivia Trudeau for field assistance to DM, Bruce Szczechowski for the photographs of the nesting birds at Pointe Mouillee, Laura King for the photograph of Mohawk Island, Judie Shore for making the map and Dean Robillard and Rob Tymstra for collecting and sharing data from Big Chicken Island in 2019. Chris Risley, Ken Abraham and Tommy King provided constructive comments on previous versions of this paper.

Literature Cited

Blokpoel, H. and **G.D. Tessier.** 1996. Atlas of colonial waterbirds nesting on the Canadian Great Lakes, 1989-1991. Part 3. Cormorants, gulls and island nesting terns on the lower Great Lakes system in 1990. Technical Report Series Number 225, Canadian Wildlife Service, Environment Canada, Ottawa, Ontario. 74 pp.

Cuthbert, F.J. and **L. Wires.** 2013. The fourth decadal U.S. Great Lakes colonial waterbird survey: Results and recommendations to improve the scientific basis for conservation and management. Final Report. Unpublished manuscript. University of Minnesota, Twin Cities, Minnesota. 40 pp+ 158 pp (Tables, Figures and Appendices).

Johnsgard, P.A. 1993. Cormorants, Darters and Pelicans of the World. Smithsonian Institution Press, Washington, D.C. 445 pp.

Knopf, F.L. and **R.M. Evans**. 2020. American White Pelican (*Pelecanus erythrorhynchos*), version 1.0 *In* Birds of the World (A.F. Poole, Ed.). Cornell Laboratory of Ornithology, Ithaca, New York, USA. https://doi.org/10.2173/bow.amwpel.01

Madden, E.M. and **M. Restani**. 2005. History and breeding ecology of the American White Pelican at Medicine Lake National Wildlife Refuge, Montana. Waterbirds 28 (Special Publication 1):23-26.

Tymstra, Y.R., D.V.C. Weseloh, D.J. Moore, D. Crump and **J.P. Ludwig**. 2019. American White Pelicans expand breeding range into western Lake Erie, 2016-2018. Ontario Birds 37:2-15.

Vanspall, K., J. Steciw and **J.A. Young.** 2005. Fifty years of American White Pelican breeding at Stum Lake, British Columbia. Waterbirds 28 (Special Publication 1):18-22.

Wismer, D.A. and **A.E. Christie**. 1987. Temperature relationships of Great Lakes fishes: a data compilation. Great Lakes Fishery Commission Special Publication 87-3. 165 p. (www.glfc.org/pubs/SpecialPubs/Sp87_3.pdf)

D.V. Chip Weseloh
Canadian Wildlife Service
Environment and Climate Change Canada
4905 Dufferin St.
Toronto, Ontario M3H 5T4
Email: chip.weseloh@canada.ca

Adam Byrne
11771 Rachel Lane
DeWitt, Michigan 48820

Doug Crump
Science and Technology Branch
Environment and Climate Change Canada
Carleton University
Ottawa, Ontario K1A 0H7

David J. Moore
Canadian Wildlife Service
Environment and Climate Change Canada
Canada Centre for Inland Waters
867 Lakeshore Road
Burlington, Ontario L7S 1A1

James P. Ludwig
19835 Duart Road
Duart, Ontario N0L 1H0