

American White Pelicans expand breeding range into western Lake Erie, 2016-2018

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The historical breeding range of the American White Pelican (*Pelecanus erythrorhynchos*, henceforth pelican) is from northern Alberta through central Saskatchewan, central-eastern North and South Dakota, western Minnesota, southern Manitoba, to extreme northwestern Ontario. There are isolated nesting locations in several mid-western US states, northern California and central-southern British Columbia (Knopf and Evans 2004). Over the past 35 years, this species has expanded its range farther into (or immediately adjacent to) northern Ontario with breeding records from Lake Nipigon (Bryan 1991, Escott and Bryan 1993) and James Bay (Peck 2007) and into the Great Lakes in Lake Michigan (Matteson *et al.* 2014) and Lake Superior (Pekarik *et al.* 2009).





American White Pelicans on Big Chicken Island, 26 July 2016.

Photo: Dave Moore.



Prior to 2014, pelicans were a rare vagrant to western Lake Erie involving single or, at most, a few individuals (Natural History Information Centre, *in litt.*). In 2014, pelicans began appearing in western Lake Erie and sightings became more numerous with increased numbers of individuals per observation each subsequent year. For example, during daily surveys by the Pelee Island Bird Observatory (PIBO) on Pelee Island in western Lake Erie, a cumulative total of 22 pelicans was recorded in 2014, 27 in 2015 and 1,424 in 2016 (PIBO, unpubl. data). Therefore, it was no surprise when nesting was confirmed in 2016 with the discovery of nests and eggs on both Big Chicken Island and Middle Sister Island in the Canadian waters of western Lake Erie. The objective of this paper is to document this first nesting of the American White Pelican in Lake Erie and thus, in the lower Great Lakes, and to present additional pelican data from 2017 and 2018 for that area.

Methods

The information in this paper is based on independent fieldwork and observations from several sources. Information from Pelee Island, Lake Erie, was provided by PIBO from daily spring and autumn standardized 90-minute surveys conducted in Fish Point Provincial Park, at the southern tip of Pelee Island, Ontario (41.7333° N, 82.6726° W; Figure 1). PIBO survey periods, which began in 2003, extend from 1 April to 31 May and from 1 August to mid-November. All other islands mentioned herein were visited by boat. Only the trip on 19 July 2016 to Big Chicken Island was made specifically to confirm if pelicans were nesting there. All other



encounters with pelicans occurred incidentally during fieldwork on contaminants and population studies on Herring Gulls (*Larus argentatus*) and/or Double-crested Cormorants (*Phalacrocorax auritus*, henceforth cormorants).

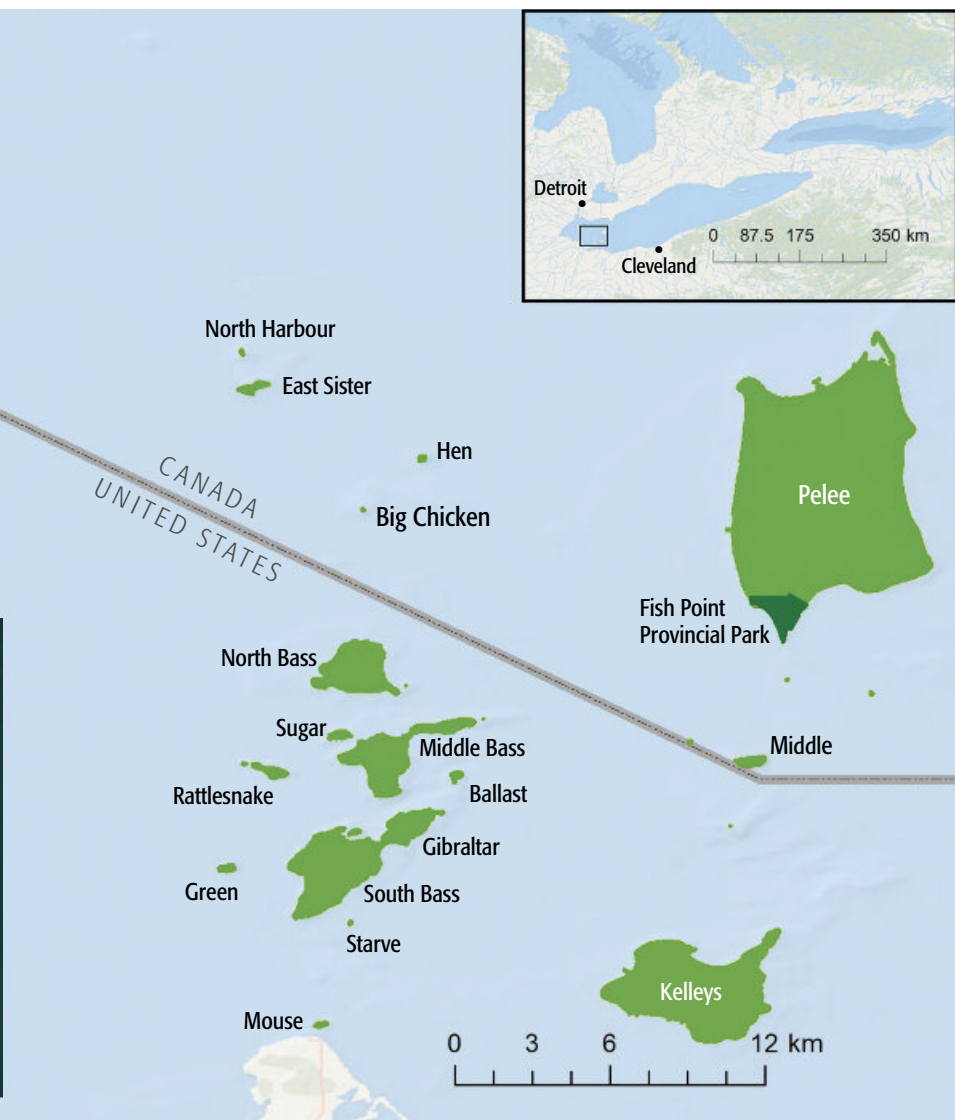


Figure 1. The Western Basin of Lake Erie. Please note the locations of Fish Point Provincial Park, Big Chicken Island and Middle Sister Island, the main sites discussed in this paper.

Map: Mike Burrell



Figure 2. The zodiac moored on Big Chicken Island, 19 July 2016.



Figure 3. An American White Pelican egg on Big Chicken Island with a small camera for scale, 19 July 2016.

Results

Pelee Island

PIBO did not record any pelicans on daily surveys between 2003 and 2013. In 2014, pelicans were recorded on three census days: two birds on 1 August, four on 3 August and 16 on 9 September. In 2015, pelicans were observed on four census days: 8-10 June and 8 September (one, five, 13 and eight birds, respectively). In 2016, pelicans were noted on 76 census days ranging from 2 May to 10 June and 2 August to 17 October. The highest count was 190 pelicans on 19 September (S. Onishi, PIBO, pers. comm.). With pelicans present in high numbers throughout the 2016 breeding season, it seemed likely they could be nesting on one of the small islands to the west of Pelee Island.

Big Chicken Island

Big Chicken Island (41.7704° N, 82.8177° W), located just south of Hen Island, is a small barren cobblestone island about 14 km west of Pelee Island. It seemed a likely location for pelicans to breed (DVCW, pers. obs.) given the current nesting of Herring Gulls and the hoistorical nesting of cormorants (Blokpoel and McKeating 1978, Morris *et al.* 2003, Weseloh 2007a,b) (Figure 1). On 19 July 2016, YRT chartered a motorized zodiac from Pelee Island Charters to make a visit to Big Chicken Island.

YRT arrived at the 'Chicken' shoals area at 19:45 hrs. As he approached Big Chicken Island, he counted about 30 pelicans, a few hundred cormorants and several dozen Herring Gulls. All birds flushed as the boat neared the island; the pelicans circled overhead briefly before departing the area. All of the pelicans observed appeared to be adults; some were in summer plumage with a black



Figure 4. Two active single egg nests of American White Pelican on Big Chicken Island, 19 July 2016.

Photos: Robert Tymstra

nape and at least one had the yellow-orange protuberance (horn) on its upper mandible, a sign of breeding condition (Knopf and Evans 2004).

YRT went ashore (Figure 2) and did a quick reconnaissance, not wanting to disturb whatever nesting was going on any more than necessary. He walked the length of the island (about 100 m) twice and returned to the boat about ten minutes later after finding five pelican nests with eggs (four with single eggs and one with two eggs). The eggs were chalky white with some staining. Several photographs were taken, using a second camera for scale, from which the eggs were estimated to be about 76 x 54 mm (Figure 3). The larger egg in the two-egg nest was estimated to be just over 79 mm. The incubation status of the eggs was not determined. Although the presence of eggs so late in the summer is somewhat unusual, it is not unprecedented in new colonies (Knopf and Evans 2004).

In addition to confirmed nests, there were at least a half dozen other suspected pelican nests nearby.

On 23 July 2016, Paul Pratt reported (*in litt.* to YRT) 70 pelicans on Big Chicken Island when he passed by the island in a boat. On 26 July 2016, DJM also made a brief (24 min) visit to the island. On approach, 105 pelicans flushed from the island and most circled and then landed on the water ≥ 100 m offshore. Ten nests were recorded during a complete search of the island: four nests with one egg and six empty nests (photos were taken of all nests). In addition to confirmed nests, an additional ten suspected nest scrapes were observed.

In 2016, pelican nests consisted of loose aggregations of sticks, vegetation and feathers placed on the bare cobble rock (Figure 4). They were concentrated in the central and highest part of the island, well away from the shore. One of the nests measured over 60 cm in



Figure 5. Part of the abandoned pelican colony on Middle Sister Island. Note the pelican eggs strewn about the ground, 26 July 2016. All pelican nests were numbered with red spray paint to avoid any double-counting or missing of nests. *Photo: Dave Moore*

diameter. It is possible that the empty nests had been abandoned, but they appeared to be under construction. No broken pelican eggshells were observed and there was no sign of any young.

Photos taken offshore from Big Chicken Island in 2017 confirmed nesting in that year. On 31 July 2017, Teddi Pertner and Zach Olsen took photos offshore of Big Chicken Island (far enough away that pelicans did not flush from the island) and confirmed nesting. Thirty-five pelicans were counted in the photos, which is likely an underestimate as coverage included only approximately half the island and the resolution was poor. However, some pelicans appeared to be incubating eggs or brooding young. On 13 August 2017, Dean Robillard took additional photos of the island, shot at ~50 m from shore, and estimated 20 adults

remained on the island as he approached. Again, photos provided incomplete coverage of the whole island, but ten medium to large downy chicks, in at least six identifiable nests, were visible. Big Chicken Island was not surveyed in 2018.

Middle Sister Island

A week after the discovery on Big Chicken Island, on 26 July 2016, DJM and Jaimie Bortolotti conducted surveys for cormorants on Middle Sister Island (41.8487° N, 83.0009° W), approximately 40 km west of Pelee Island (Figure 1). While criss-crossing the heavily forested island (predominantly Hackberry *Celtis occidentalis*), counting cormorant tree-nests, they came across 24 abandoned pelican nests with cold eggs and/or eggshells (Figures 5 and 6). There were nine 0-egg nests, six 1-egg nests and nine

2-egg nests. Eggs were crushed or broken in seven of the nests. Two of the pelican eggs were collected and later deposited at the Royal Ontario Museum. The nests were located on the ground in small clearings among the trees (Figure 6), approximately 50 m in from the north shore of the island (Figure 1). The trees and understorey were dense enough that adult pelicans would have had to walk in from the beach to access their nests in the forest. Finding this nesting cluster was a complete surprise, as no pelicans were seen near or on the island. Nests consisted of shallow scrapes made in the soil or litter (mostly wood chips and sticks at this site), with scattered sticks loosely built up around the perimeter (as seen on Big Chicken Island, Figures 4-6). Individual photos

were taken of all nests (e.g., Figure 7) and the size of nests and eggs were estimated from these using the objects included for scale. Nests were 53 cm in diameter (± 12 cm SD, range=39-86 cm, $n=18$). Eggs were 68 ± 8 mm long (range=53-81 mm, $n=13$) and 44 ± 5 mm wide (range=38-54 mm, $n=12$).

In 2017, while carrying out toxicological studies on Middle Sister Island, DC and Kim Williams estimated “about” 30 and 34 pelican nests, on 25 April and 3 May, respectively. The nests were located on the west side of the island (Figure 1). On both visits, they noted numerous nests with 0-egg, 1-egg and 2-egg pelican clutches. They visited the island a third time on 13 June and noted egg fragments and dead pelican chicks. They also saw

Figure 6. Two 0-egg nests and one 1-egg nest of American White Pelican on Middle Sister Island. Nest material had become scattered and nests were barely discernable; all nests were abandoned, 26 July 2016. Similar clumps of abandoned pelican nests were scattered over an area of approximately 30 x 30 m, which comprised the extent of the “colony”. *Photo: Dave Moore*





Figure 7. An abandoned 2-egg nest of American White Pelican on Middle Sister Island with little or no structured nest, 26 July 2016. The fieldbook is included as a known size comparison.

Photo: Dave Moore

both a red fox (*Vulpes vulpes*) and a Bald Eagle (*Haliaeetus leucocephalus*) on the island. On a visit to Middle Sister Island on 22 June, for further toxicological work, JPL noted that all the ground nests of all species were obliterated there. He saw no adult pelicans around or near the island, so there appeared to be a complete failure of their nesting.

On 24 April 2018, DC estimated about 30 pelican nests on the east side of the island (Figure 1) but did not investigate any further to minimize disturbance. JPL visited the island on 6 July and noted four large flightless young pelicans (Figure 8) but did not search any further for the same reason. Therefore, it appears that there was pelican production in 2018.

Discussion

The islands and shoreline areas of western Lake Erie, on both the Canadian and the US sides of the lake (e.g., East and West Sister Islands, respectively), comprise one of the most important breeding areas for colonial waterbirds in the entire Great Lakes system (Blokpoel and McKeating 1978, Weseloh *et al.* 1988, Wires and Cuthbert 2001, Greenwood *et al.* 2007). There is a considerable variety of habitat for nesting by colonial waterbirds and they have responded positively. In the last 35 years, 11 species of colonial waterbirds (five species of herons, two species of gulls, three species of tern and one species of cormorant) have been recorded nesting on at least 38 different natural and man-made sites in the western basin of Lake Erie (Blokpoel and Tessier 1996, Scharf and Shugart 1998, Scharf 1998, Weseloh *et al.* 2002, Morris *et al.* 2003, Wires and Cuthbert 2013).

Figure 8. Large flightless young American White Pelicans, photographed on Lake Nipigon on 7 July 2001, similar to those that were seen on Middle Sister Island on 6 July 2018. Photo: Glenn Barrett



The American White Pelican is the 12th colonial waterbird species recorded nesting in western Lake Erie. Pelicans first nested in the Great Lakes on Cat Island in Green Bay, Wisconsin, Lake Michigan, with two nests in 1994 (Soulen 1995, Matteson *et al.* 2014); they have nested there every year since then. In 2018, there were 4,677 pelican nests on eight islands in Lake Michigan (F. Cuthbert, pers. comm.). Pelicans were first found nesting in the Canadian Great Lakes on Granite Island in northern Lake Superior, east of Thunder Bay, Ontario, in 2007 with 20 nests (Pekarik *et al.* 2009). Confirmed nesting was observed on Granite Island in seven of nine years between 2009 and 2017. No visits were conducted during the two years for which no breeding data were confirmed. In 2017, there were approximately 30 nests on the island (DC, pers. obs.).

There are no pelican nesting records yet from the Ohio waters of Lake Erie (M. Shieldcastle, *in litt.*). The two Canadian islands in western Lake Erie where nesting was observed are quite distinct in terms of habitat. Big Chicken Island is a small, low-lying cobblestone island with no vegetation and many nesting Herring Gulls and many loafing/roosting cormorants. It has clear 360° visibility and complete fly-in access to the pelican nests. Middle Sister Island is a much larger, heavily forested island with moderate ground cover throughout. Herring Gulls nest predominantly around the perimeter

of the island but there are also nests in the interior. Most cormorants nest in trees but there are also numerous pairs nesting on the ground in the interior. Great Egrets (*Ardea alba*) and Black-crowned Night-Herons (*Nycticorax nycticorax*) also breed there (Rush *et al.* 2015). There was no clear visibility of the lake from the pelican nesting clusters in 2016-18. The difference between the islands could not be much greater: the small, barren, cobblestone island (the preferred habitat) (Koonz 2003) and the larger, forested island with areas of heavy ground vegetation. This latter situation, however, is a known nesting habitat for pelicans, especially in forested areas (Knopf and Evans 2005) and for new colonies (Koonz 2003).

In order to minimize disturbance at these new colonies, we did not monitor nesting success. However, there are two observations that warrant further comment. First, the average measurements of eggs from Lake Erie (69 mm x 46 mm) were about 20% less than the average size reported for pelican eggs (90 mm x 56.5 mm), and the largest (81 mm) was shorter than the overall length range (81.5-103 mm) (Knopf and Evans 2004). Eggs were

measured predominantly (13 of 15) at Middle Sister Island, and only during the first year this site was colonized. Reduced egg size may have been an anomaly in that year, or perhaps, related to age of the breeding birds and/or lateness of nesting (Haymes and Blokpoel 1980, Nisbet *et al.* 1984, Kraupa *et al.* 2004, Tsuboi and Ashizawa 2011, Clark and DiMatteo 2018) or female body condition (Gladbach *et al.* 2010); clutch initiation is often delayed when nesting at a new site (DVCW and DJM, unpubl. data). Egg length and breadth were not measured directly, but rather estimated from photographs. It is possible that this method, in which photographs were not collected in a standardized way, resulted in a systematic underestimate of actual egg size. Second, it seems clear that no chicks were fledged during three of the five known breeding attempts (combining the two sites over three years). In 2016, clutches on Big Chicken Island were initiated in mid- to late-July, which was likely too late in the season to result in any fledged chicks. On Middle Sister Island, the colony was abandoned during incubation in 2016 and, even though some chicks hatched in 2017, there was no productivity in that year, likely due to predation or associated disturbance. In 2017 on Big Chicken Island and in 2018 on Middle Sister Island, young pelicans may have fledged.

The American White Pelican is undergoing a dramatic expansion of its breeding range in North America (Knopf and Evans 2004, Anderson *et al.* 2005). It appears that this expansion has not been accompanied by an increase in its numbers but rather by an abandonment of previously established colonies. For example, in 2004,

28,000 pelicans abandoned the large nesting colony at Chase Lake, North Dakota (Anderson and King 2005). Three additional nesting sites have been reported in Ontario recently. A site in Lac Seul has been active annually from 2009-2015 with up to 75 nests and successful reproduction (Natural History Inventory Centre, unpubl. data). Two sites on the Welcome Islands in Thunder Bay, Lake Superior, had 11 nests in 2009 (DJM, pers. obs.) and “about 25 nests” in 2015 (DC, pers. obs.). The outcomes of nesting at these sites are not known.

The nesting on Lake Erie, so far from the colony sites in Lake Michigan and Lake Superior seems unusual; why such a large dispersal from the nearest established breeding colony (550 km away)? As various authors and studies have shown, pelicans range and forage very widely from their nesting colonies, e.g., over 300 km to find food for their young (Johnson and Sloan 1978, Yates 1999, Madden and Restani 2005, Murphy 2005). Western Lake Erie has been identified as a predictable location for pelicans during pre- and post-breeding migratory periods (eBird data 2004-2016; Fink *et al.* 2018). Presumably, birds could have prospected this area as they migrated to and from more northerly breeding colonies.

In summary, in Ontario, American White Pelicans are now known to nest in at least five major lakes: Lake of the Woods (Baillie 1938, Peck and James 1983, 2007), Lake Nipigon (Bryan 1991, Escott and Bryan 1993), Lake Superior (Pekarik *et al.* 2009), Lac Seul (see above) and Lake Erie (this paper). They now nest on three of the Great Lakes (Lake Michigan, Lake Superior and Lake Erie). This

eastward expansion of the pelican into Ontario and the Great Lakes is very similar to that of another colonial waterbird from 80-90 years ago: the Double-crested Cormorant. In the modern era, cormorants also first nested in the Great Lakes in Lake Superior (1913) and moved eastward. It appeared in Lake Huron in 1932 and in Lake Ontario and Lake Erie in 1938 and 1939, respectively (Weseloh *et al.* 1995). While pelicans have not yet started to nest in Lake Huron or Lake Ontario, it is perhaps only a matter of time. Both of those lakes have seemingly very suitable habitat, i.e., remote small rocky islands with other colonial waterbirds. The Watcher and Limestone Islands in Georgian Bay, Lake Huron, and Scotch Bonnet and Pigeon Islands in Lake Ontario may be the most likely future nesting locations. Time will tell if they become breeding birds Great Lakes-wide.

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