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# Usurpation of an Interior Least Tern (*Sternula antillarum athalassos*) Nest by Piping Plovers (*Charadrius melodus*)

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**Abstract.**—Nest usurpation is a strategy in which an individual or pair of one species takes over the nest of another species. This is the first documented occurrence of a Piping Plover (*Charadrius melodus*) pair usurping an Interior Least Tern (*Sternula antillarum athalassos*) nest. The Piping Plovers incubated the three Interior Least Tern eggs in the nest, and all three eggs hatched. The adult Piping Plovers accompanied and brooded the Interior Least Tern chicks for 1 day post-hatching, but we did not see the adult Piping Plovers nor the Interior Least Tern chicks after that day. The Piping Plovers likely usurped the Interior Least Tern nest because they developed hormone-mediated broodiness after they lost the eggs from their two previous nesting attempts. When the Piping Plovers encountered an unattended Interior Least Tern nest with eggs, they instinctively took the nest and its contents as their own. Received 18 January 2018, accepted 28 March 2018.

**Key words.**—*Charadrius melodus*, Interior Least Tern, nest usurpation, Piping Plover, *Sternula antillarum athalassos*. Waterbirds 41(3): 322-325, 2018

Brood parasitism, egg dumping, and nest usurpation are reproductive behaviors known to occur with varying frequency among birds. Brood parasitism, the most well-known of these behaviors, is the intentional laying of eggs in the nest of another bird without contribution to the incubation or care of the young (Payne 1977). Egg dumping is the incidental deposition of eggs in the nest of the same or different species. Egg dumping is thought to be an evolutionary precursor to brood parasitism (Hamilton and Orians 1965). Nest usurpation, the least understood of these behaviors, occurs when an individual or pair of one species takes over the nest of another species for reproduction (Favaloro 1942; Lake 2004; Barrientos *et al.* 2015).

Favaloro (1942) described three types of nest usurpation. The first type of nest usurpation is a non-aggressive take-over when a breeding pair makes use of a nest no longer occupied by the original owners. The second type is an aggressive take-over where a breeding pair displaces the true owners of a nest, destroying the eggs or chicks, and taking the nest as their own. The third type is an aggressive or non-aggressive take-over of a nest where the usurpers assume the nest, eggs, and/or chicks as their own; this type of nest

usurpation has been previously documented in shorebirds and waterfowl (Midura *et al.* 1991; Paz and Eshbol 2002; Lake 2004; Pratte *et al.* 2016).

Here, we document an occurrence of the third type of nest usurpation where a pair of Piping Plovers (*Charadrius melodus*) took over the nest and eggs of an Interior Least Tern (*Sternula antillarum athalassos*) pair. Piping Plovers (U.S. Fish and Wildlife Service 1985a) and Interior Least Terns (U.S. Fish and Wildlife Service 1985b) are legally protected species that nest in proximity to one another across much of their ranges (Thompson *et al.* 1997; Elliott-Smith and Haig 2004). Both species are ground-nesting birds, constructing simple, shallow scrape nests on expanses of unvegetated sand such as river sandbars, beaches, and human-created sand landscapes (e.g., sand and gravel mines, lakeshore housing developments). Their nests and eggs are similar in appearance; however, they can be discriminated by a trained observer (M. B. Brown, pers. obs.). Piping Plovers forage for invertebrates found on sandy shorelines using short runs interspersed with pecks at food items (Elliott-Smith and Haig 2004). Interior Least Terns forage for small surface-swimming fish using hovering and short dives (Thompson *et al.* 1997).

## METHODS

## Study Area

We monitored Piping Plovers and Interior Least Terns while they were nesting at sand and gravel mines and lake shore housing developments along the lower Platte River in eastern Nebraska, USA, from 2008-2017 (Fig. 1). The majority of both species in our study area nest in these human-created landscapes; relatively few nest on river sandbars. The nest usurpation took place on a beach at a lakeshore housing development that had previously been a sand and gravel mine.

## Observations

For both species at all known nesting sites, we searched for and located nests, recorded nest locations using a handheld Garmin GPS unit (Garmin Oregon 550t, Garmin Ltd., Olathe, Kansas, USA), recorded the number of eggs in each nest, determined the nest initiation date using egg floating (Hays and LeCroy 1972), and identified the adult birds associated with each nest. We captured incubating adult Piping Plovers by using a walk-in trap placed over their nest and captured Piping Plover and Interior Least Tern chicks by picking them up off the sand. We did not routinely capture adult Interior Least Terns. We banded all captured Piping Plovers with a U.S. Geological Survey numbered metal band and a unique color band combination. We banded all captured Interior Least Tern chicks with a U.S. Geological Survey metal band. We attempted to visit each nest at human-created nesting sites every 3-7 days throughout the incubation period. We observed the usurped nest every 3-4 days during the incubation period.

## RESULTS

We monitored 584 Piping Plover nests and 2,224 Interior Least Tern nests at human-created nesting sites within our study area from 2008-2017. We observed only this one occurrence of nest usurpation during this time. On 20 June 2017, we observed a pair of adult Piping Plovers incubating three 5-day-old Interior Least Tern eggs at a lakeshore housing development near Fremont, Dodge County, Nebraska, USA (Fig. 1). Adult Interior Least Terns were observed incubating nests in the same area, but we did not observe any adult Interior Least Terns at the nest being incubated by the Piping Plovers. On 6 July, we observed the Piping Plovers attending three newly hatched Interior Least Tern chicks in the nest. Two of the chicks walked down to the shoreline accompanied by one of the adult Piping Plovers,

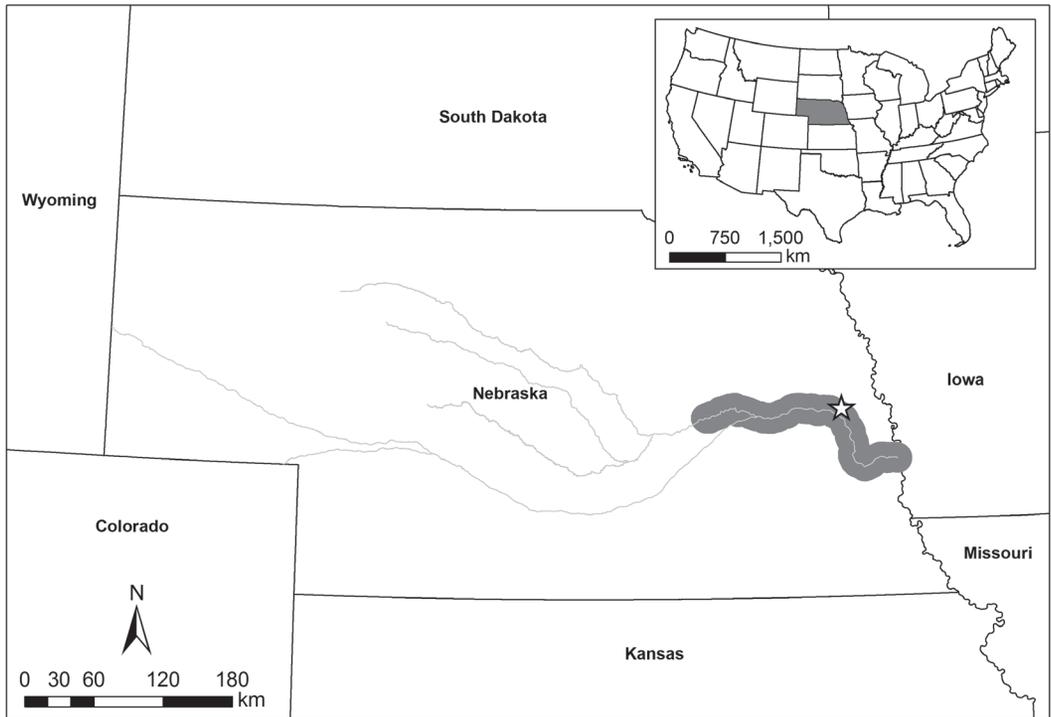
and the other chick remained in the nest cup attended by the other adult Piping Plover. We did not see the adult Piping Plovers nor the Interior Least Tern chicks after that date.

On 3 May, we first observed the adult Piping Plovers involved in the nest usurpation attend a nest containing four Piping Plover eggs; this nest failed on 23 May. On 2 June, the two adult Piping Plovers were observed injury-feigning and behaving territorially near a Piping Plover nest containing four eggs; this nest was located approximately 34 m away from their first nest, and it failed on 20 June. All three nests involved in this occurrence (the two failed Piping Plover nests and the usurped Interior Least Tern nest) were located within 60 m of each other. The usurped nest was located in a colony of 11 Interior Least Tern nests, and there were two broods of Piping Plovers in the vicinity, with chicks ranging from 1-2 to 20+ days of age on 20 June 2017 (the day we found the usurped nest). No Piping Plover eggs were laid in the usurped nest.

One of the adult Piping Plovers was banded as a chick in 2013 and was 4 years of age at the time of the nest usurpation occurrence. It nested at this same location from 2014-2017. The other adult Piping Plover was banded as an adult in 2016 and was at least 2 years of age at the time of the nest usurpation occurrence. In 2016, it nested at a site 20 km south of this location. We do not know the sex of either bird, but both had previous nesting experience.

## DISCUSSION

Nest usurpation involving Least Terns and Piping Plovers has been reported on one other occasion (Midura *et al.* 1991). In that instance, a Piping Plover nest with three eggs was usurped by a pair of Least Terns who laid two additional eggs in the nest. The Least Terns successfully incubated and hatched two Piping Plover chicks and two Least Tern chicks. The only chick known to survive to fledging age was a Piping Plover chick that was fostered by researchers into a nearby Piping Plover brood after it



**Figure 1.** Location of the study area within the contiguous USA and locally (gray shading) along the lower Platte River. The nesting site near Fremont, Nebraska, is marked with a white star.

was hatched by the Least Terns (Midura *et al.* 1991). We did not introduce the Interior Least Tern chicks into a foster Interior Least Tern brood. We did not expect the Piping Plover adults to be able to raise the Interior Least Tern chicks given the extensive differences in foraging behavior and diet for these two species.

A likely explanation of why the Piping Plovers usurped the Interior Least Tern nest is that the Piping Plovers, having attempted and lost two nests, were ‘broody.’ Broodiness is a hormone-mediated (prolactin) behavior that halts egg laying and initiates egg and brood care (Welty and Baptista 1990). It is plausible that broodiness developed just before the Piping Plovers lost their second nest. When they ‘found’ an unattended Interior Least Tern nest with eggs, they instinctively claimed the nest as their own. We did not observe the adult Interior Least Terns associated with the nest respond to the usurping Piping Plovers, so perhaps the nest had been abandoned.

The nest involved in this occurrence was in the nesting area at a lakeshore housing development. It is possible, but unlikely, that occupying this human-created habitat elicited aberrant nesting behavior in the Piping Plovers. We have monitored Interior Least Terns and Piping Plovers for 10 years, and, until this nest usurpation in 2017, we had not observed any behaviors at human-created nesting areas that were not also observed at natural sandbar nesting areas.

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