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EFFECT OF INSTALLING OSPREY (*Pandion haliaetus*) NESTING PLATFORMS ABOVE STADIUM LIGHTS ON OSPREY PRODUCTIVITY

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Abstract.— Ospreys (*Pandion haliaetus*) commonly nest on utility poles and stadium light fixtures, where there are increased risks of fire and electrocution. Nesting on utility poles also leads to human conflict by causing power outages and preventing regular maintenance. The objective of this study was to evaluate whether nesting platforms installed above existing Osprey nests on stadium lights would be used by Ospreys and whether the productivity at these platforms would be comparable to productivity at the same sites prior to platform installation. In the fall of 2017, nine nesting platforms were installed above existing Osprey nests on stadium lights at Eckerd College in St. Petersburg, Florida. We monitored these nine nests for two years prior to platform installation and for two years afterwards. After the platforms were installed, all nine Ospreys nested on the platforms and none attempted to nest on the stadium lights. The difference in the number of fledglings was not statistically significant. Nesting platforms appear to be an effective method for reducing human conflict with Ospreys without affecting productivity.

Key words: human conflict, nest relocation, Osprey, *Pandion haliaetus*

Ospreys (*Pandion haliaetus*) are adaptable, piscivorous raptors that serve as an important indicator of ecosystem health. Osprey productivity and population size both decreased because of bioaccumulation of the by-products of the insecticide dichlorodiphenyltrichloroethane (DDT; Hickey and Anderson 1968), but the ban of DDT allowed Osprey populations to rebound (Bierregaard et al. 2020). In 1981, less than 10 years after the ban of highly-persistent DDT, there were approximately 1,750 Ospreys in Florida, and this number rose to between 2,500 and 3,000 Ospreys in 1994 (Houghton and Rymon 1997). In Pinellas County,

Florida, there are now >100 pairs of Ospreys (Osprey Watch Database 2020). Much of their current success is likely due to their ability to nest on artificial structures such as cell phone towers, utility poles, and stadium light fixtures (Reese 1997, Henny et al. 2008). However, nesting on utility and stadium poles can put Ospreys at risk through fire and electrocution and put them in conflict with humans by causing power outages and problems with maintenance (Washburn 2014). Simply removing nests from poles is ineffective because Ospreys often quickly re-nest and permits are sometimes required to move nests (Bierregaard et al. 2020). Although the Osprey is not a listed species in Florida, it is protected by the federal Migratory Bird Treaty Act and a permit is needed to remove an active nest (FWC 2018). A more effective option is to provide Ospreys with an alternative nesting option such as a nesting platform placed in close proximity to or above the utility pole or stadium light (APLIC 2006, FWC 2018). Many artificial nest platforms have been built and subsequently occupied by Ospreys, but relatively few studies have quantified the effectiveness of installing nesting platforms in encouraging Ospreys to relocate nests from utility poles or stadium lights (Austin-Smith and Rhodenizer 1983, Kochert and Olendorff 1999).

For over ten years, Ospreys at Eckerd College in St. Petersburg, Florida nested behind the stadium lights in the metal boxes that were intended to support a person doing maintenance on the lights (Fig. 1). During the breeding season, it was not possible to service the lights and some of the nesting material covered the lights and reduced their brightness. At some nests, Ospreys incorporated the power lines from the pole to the lights into their nests, potentially increasing the chance of fire. For these reasons, we chose to install nine Osprey nesting platforms and were thus provided with a unique research opportunity.

We evaluated whether Ospreys would move their nests onto nesting platforms installed above existing Osprey nests on stadium lights and whether this movement would affect the number of young produced. We compared the number of well-grown young produced from the stadium light nests to those produced on the nesting platforms.

Methods

We conducted this research effort at Eckerd College in St. Petersburg, Florida. This suburban campus is located directly on the Gulf of Mexico at the mouth of Tampa Bay in Pinellas County. The nine nests analyzed in this study were all on 20-m stadium light fixtures surrounding baseball, softball, and soccer fields. The nests were within 0.5 km of the saltwater bay and a relatively large (2 ha) freshwater pond.

We visited nests weekly from September 2015 through August 2019. During each visit we recorded nest condition, presence of adults, presence of a female in incubation posture, and number of chicks. If we saw an adult Osprey in incubation posture for more than two visits, we considered the nest to be active and recorded the earlier date (Forys et al. 2016).

Figure 1. Osprey platform (3 m × 3 m) placed above stadium lights at Eckerd College, St. Petersburg, Florida. Nesting material seen in metal box next to light belongs to monk parakeets (*Myiopsitta monachus*). Photographed by Fairl Thomas.

We determined nest success by counting the number of well-grown young that we observed in the nest just prior to fledging (Steenhof and Newton 2007, hereafter called fledglings). We considered a nest to be successful if we saw at least one fledgling at the nest.

After the end of the 2017 breeding season, we installed nine 3 × 3-m Osprey platforms approximately 1 m directly above the stadium light fixtures (Fig. 1). We removed Osprey

nesting material from the metal boxes and placed some of it on the nesting platform. We did not place any deterrents on the metal boxes because there was concern they would impede maintenance of the lights.

To determine if the number of fledglings differed significantly during the breeding seasons when the Ospreys were nesting on the lights compared to the platforms, we compared the average number of fledglings the two years before the platforms were installed (2016, 2017) to the average number after the platforms were installed (2018, 2019). In addition, we compared nest success (determined by the presence of at least one fledgling) before and after platform installation. Because our sample size was very small (n = 9 nests), we used non-parametric Mann Whitney U-tests on pooled data for the two years before installation and the two years after using SPSS (IBM, Armonk, NY, USA).

Results

All nine nest sites were occupied by a pair of incubating Ospreys each breeding season. In 2016 four of the nine nests were successful, in 2017 there were three, in 2018 there were six, and in 2019 there were four. Success before and after the platform installation did not differ significantly (U-test: $z = -0.469$, $P = 0.639$). The average number of fledglings per pair was similar each year ranging from 0.56 to 0.78. Number of fledglings ranged from 0 to 3 per nest, with 3 young in a nest occurring only once in 2016 (Table 1). The number of young produced per pair was not significantly different among the 4 years of our study (Mann-Whitney U-test: $z = -0.137$, $P = 0.891$).

Discussion

All of the Osprey mating pairs relocated from the stadium lights to the nesting platforms, despite the lack of deterrents at the original nest sites. Although some males and females were seen in and near the

Table 1. Number of Osprey fledglings seen at the nine Eckerd College (St. Petersburg, FL) nests prior to platform installation (2016 and 2017) and after the installation (2018 and 2019).

	Before platforms		After platforms	
Nest	2016	2017	2018	2019
1	1	2	2	2
2	0	0	1	0
3	0	1	0	0
4	0	0	1	0
5	0	0	2	0
6	2	0	1	1
7	1	0	0	1
8	3	0	1	1
9	0	2	0	0
Average	0.78	0.56	0.89	0.56
SD	1.09	0.88	0.78	0.73

nests prior to January, incubation began January–March and chicks fledged between April and July. After the platforms were installed, Ospreys were occasionally seen perching on the metal boxes behind the stadium lights, but none attempted to nest in the location of the original nests. Although this is a small study involving only nine nests, it indicates that installing nesting platforms above stadium light poles can be an effective method of preventing Ospreys from nesting directly on the light post. This supports the recommendations made by the Avian Power Line Interaction Committee (APLIC 2006) and the Florida Fish and Wildlife Conservation Commission (FWC 2018) that suggest placing nest platforms as close as possible to existing nests.

Nest success and productivity was similar during the 4 years of the study, indicating that Ospreys do equally well on a variety of artificial substrates. These results are in agreement with the results of a larger study of Ospreys in Pinellas County that found Osprey platforms and other artificial substrates did not significantly differ in the number of offspring produced (Forys et al. 2016). Studies of Ospreys at other locations produced similar results; productivity was not significantly different between platforms and other artificial structures (Van Daele and Van Daele 1982, Austin-Smith and Rhodenizer 1983, Martin et al. 2005). This similarity in productivity is likely because although nesting platforms can reduce the risk of fires or electrocution, these occasions are generally uncommon and thus are unlikely to affect long-term productivity. The primary gain from creating Osprey platforms above the lights was the reduction in conflicts between humans and Ospreys.

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