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PRODUCTIVITY OF OSPREYS (*Pandion haliaetus*) NESTING IN HIGHLY URBANIZED PINELLAS COUNTY, FLORIDA

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Ospreys (*Pandion haliaetus)* are highly adaptable fish-eating birds of prey that have a worldwide distribution. Osprey populations declined throughout much of their range due to bioaccumulation related to spraying of the DDT biocide, but increased after the DDT ban (Houghton and Rymon 1997). In Florida, Ospreys nest throughout the state both in coastal and inland wetland environments (Florida Natural Areas Inventory 2001). The post-DDT rebound of Ospreys in Florida has occurred during a time of increasing urbanization, particularly in coastal areas (Rayer and Wang n.d.), perhaps aided by an increase in man-made nesting structures (Watts and Paxton 2007). Increases in Osprey and human populations have led to more frequent conflicts between Ospreys and utilities such as power poles and transmission towers, cell-phone towers and Osprey-aircraft collisions (Washburn 2014).

The purpose of this paper is to examine nest success and productivity of Ospreys nesting in Pinellas County, the most densely populated county in Florida. In addition, we compared nest success of Ospreys nesting on natural nest sites (live and dead trees), artificial structures not specifically designed for Osprey nesting (e.g., light poles, cell-phone towers) and nesting platforms specifically designed for Ospreys.

METHODS

Pinellas County is located on the Gulf of Mexico in central Florida (Fig. 1). It is the most densely populated county in Florida with > 3,000 people per square mile (Rayer and Wang n.d.) but it is also home to >100 pairs of Ospreys (Osprey Watch Database).

Beginning in 2009, we compiled a database of Osprey nests in the southern half of Pinellas County by soliciting information from the local birding community and systemically driving and walking through areas where Ospreys are likely to nest. From September 1, 2013 to August 30, 2014, we monitored all known Osprey nests once each week during daylight hours using protocol established by Project Osprey-watch (Osprey Watch Database). Nests were monitored from the ground using 10x40 binoculars for at least 15 minutes/survey and we recorded presence of adult Ospreys, incubation, chicks and flight capable chicks (fledges). For a nest to be considered occupied, a pair of adult ospreys had to been seen. For a nest to be classified as active, an adult needed to be in incubation posture. We further required that the incubation must be seen in at least two weekly surveys. An inactive nest had either no Ospreys or was visited by a single Osprey.

Nests were categorized as being on a natural substrate, an artificial substrate that was not designed for Ospreys, or on an Osprey platform.

SPSS software was used to compare overall nest success and nest productivity by nesting substrate. A chi-square goodness of fit test was conducted to determine if nesting success varied between nests on artificial or natural nests and to measure success rates for Ospreys nesting specifically on platforms built for Osprey nesting compared to nests on artificial structures such as utility poles and cell phone towers. Overall productivity was calculated using a standard method of taking the number of fledges or birds almost fledged and dividing by the number of active nests (Bierregaard et al. 2014).

RESULTS

Out of 90 nests monitored, 70 nests were active with an incubating pair during the 2013-2014 breeding season (Table 1). While some nests were directly on the coast, nests were found throughout our study area and up to 4 km from saltwater (Fig. 1). Approximately half of the pairs began incubating from December to February (31 out of 70) while the remainder began incubating in March or April. No new nesting was observed in late spring or summer.

Only 11 of the Osprey nests were on natural substrate and all were on dead trees, 10 slash pine (*Pinus elliottii*) and 1 Canary Island date palm (*Phoenix canariensis*). The remaining 59 were on artificial structures. Sixteen of the nests were on Osprey platforms that had been placed above existing lights or poles, 41 were directly on utility poles or lights, 1 was on the concrete remains of a dock, and 1 pair nested on a cell phone tower.

Thirty-seven out of 70 nests produced at least 1 fledge and overall productivity was 0.80 young/active nest (Table 1). Artificial active nests were significantly more likely to fledge at least one young than active nests on trees ($\chi^2 = 6.30$, d.f. = 1, $p = 0.012$; Fig. 2). Two of the active nests on dead trees both produced 1 fledge, the other 9 active nests failed to hatch any chicks. Two out of the 9 unsuccessful natural nests fell to the ground during storms but we were not able to determine why the other natural nests were unsuccessful. The majority of active nests on artificial substrates fledged young. Twenty active nests produced 1 fledge, 11 produced 2 fledges, and 4 nests fledged 3 young.

Table 1. Fate of the 90 Osprey nests in Southern Pinellas County.

	Natural substrate	Artificial substrate	Total
All nests	15	75	90
Inactive (not occupied or active)	0	7	7
Occupied (but not active)	4	9	13
Active nests	11	59	70
Nests with fledglings	2	35	37
Number of fledglings	2	54	56

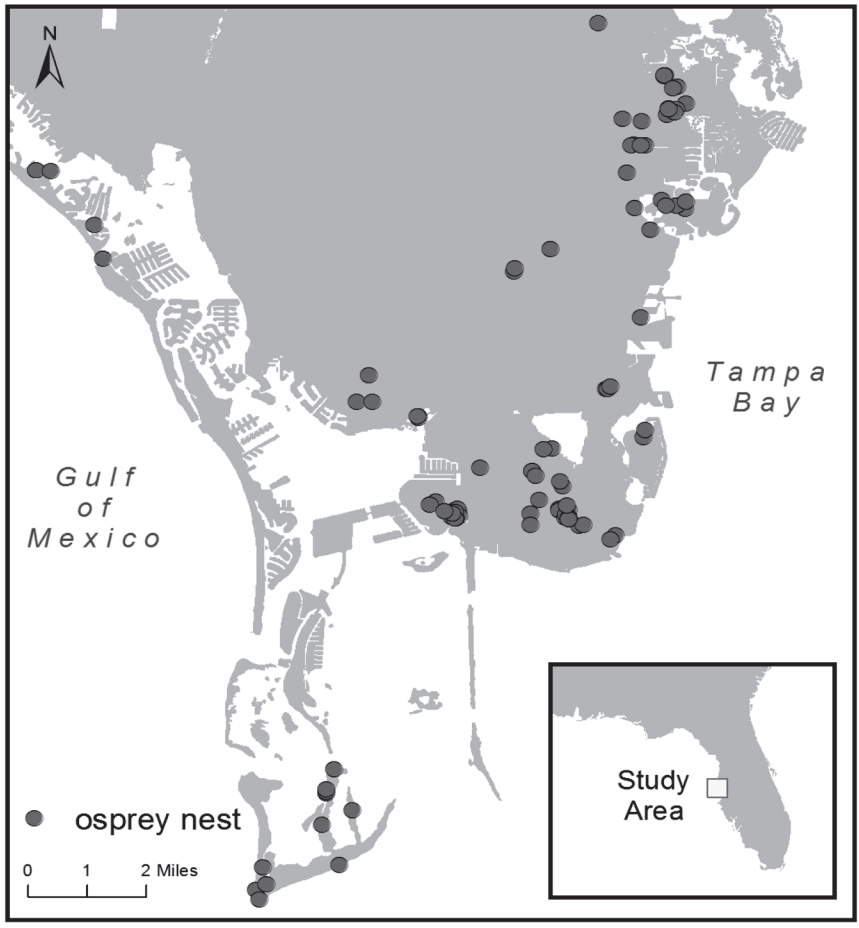

Figure 1. Southern Pinellas County Osprey nests that were monitored during this study. The shaded area is land, the white is water.

Osprey platforms were more likely to produce fledges than other artificial structures (75% compared to 53%) but this difference was not statistically significant ($\chi^2 = 2.24$, d.f. = 1, p = 0.135).

Discussion

In Pinellas County, Florida, the majority of Osprey nesting is occurring on artificial structures, and these nests fledged more young than Ospreys nesting on trees. The increase in development, especially in Pinellas County, probably contributed to more artificial nesting structures being used as natural nesting sites were destroyed. As Poole (1981) suggested, the Osprey using these artificial nesting structures in

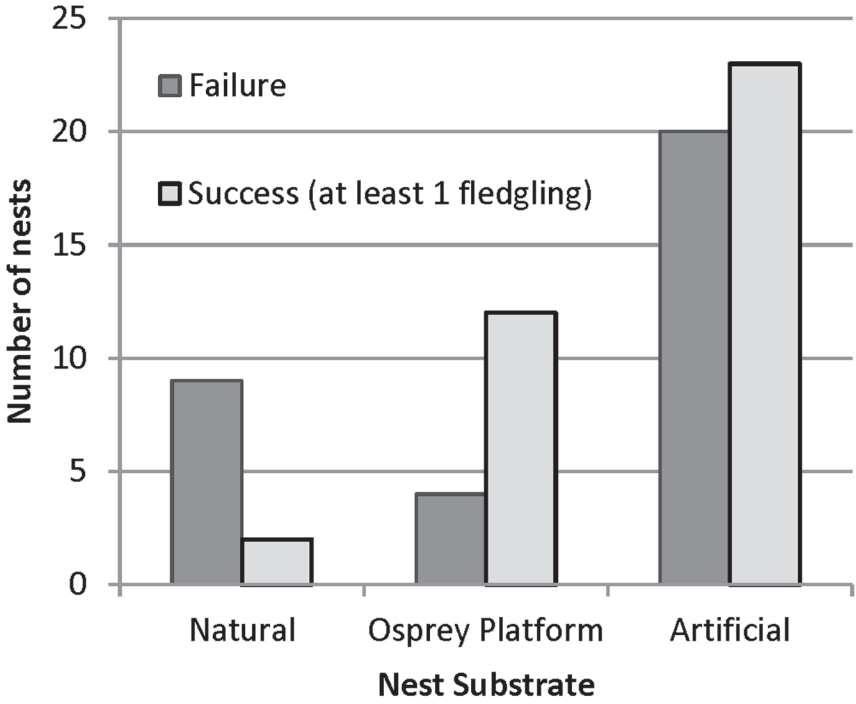

Figure 2. Number of Osprey nests on each substrate that either failed and produced no fledglings, or produced at least 1 fledgling.

urban settings have probably also adapted to having close proximity with humans. These artificial structures may also be assisting the growth of the southern Pinellas County Osprey population, a trend found by Ewins (1996) at the Canadian Great Lakes Basin and Henny et al. (2008) in northwestern Mexico. Our study agrees with research done in Sanibel Island, FL where artificial nests produced nearly twice as many chicks than those nests in trees (Westall 1983). Our study differs from that of Martin et al. (2005) who found that nests on tree stumps around lakes in Ontario were more successful than nests on artificial structures.

Nesting platforms specifically designed for Ospreys appear to be a successful management strategy when Ospreys are nesting on a dangerous artificial substrate such as electric wire. Our study area had proportionally fewer Ospreys nesting platforms compared to a comprehensive study of Ospreys in the Northeastern US (Bierregaard et al. 2014).

Osprey productivity in Southern Pinellas County during 2013/2014 reflects Spitzer's (1980) estimate of maintaining a stable Osprey population with an average of 0.8 fledglings/active nest. Compared

with Osprey productivity in urban Minneapolis-St. Paul (1.57 fledges/active nests), Pinellas County's Osprey productivity is stable but has the opportunity to increase (Martell et al. 2002). However, our data are from only one year of intensive monitoring, and clearly more years of monitoring are needed to get an average productivity rate. In addition, future monitoring using webcams or similar technology would enhance our understanding of nest successes and failures.

Acknowledgments

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Literature Cited

Bierregaard, R. O., A. F. Poole, and B. E. Washburn. 2014. Ospreys (*Pandion haliaetus*) in the 21st century: Populations, migration, management, and research priorities. Journal of Raptor Research 48:301-308.

Ewins, P. J. 1996. The use of artificial nest sites by an increasing population of Ospreys in the Canadian Great Lakes Basin. Pages 109-123 *in* Raptors in Human Landscapes: Adaptations to Built and Cultivated Environments (D. M. Bird, D. E. Varland, and J. J. Negro, Eds.). Academic Press Inc., San Diego.

Florida Natural Areas Inventory. 2001. Field Guide to the Rare Animals of Florida. <http://www.fnai.org/FieldGuide/pdf/Pandion_haliaetus.PDF>. Accessed 1 April 2014

Henny, C. J., R. A. Grove, and J. L. Kaiser. 2008. Osprey distribution, abundance, reproductive success and contaminant burdens along lower Columbia River, 1997/1998 versus 2004. Archives of Environmental Contamination and Toxicology 54:525-534.

Houghton, L. M., and L. M. Rymon. 1997. Nesting distribution and population status of U.S. Ospreys 1994. Journal of Raptor Research 31:44-53.

Martell, M. S., J. V. Englund, and H. B. Tordoff. 2002. An urban Osprey population established by translocation. Journal of Raptor Research 36:91-96.

Martin, P. A., S. R. de Solla, P. J. Ewins, and M. E. Barker. 2005. Productivity of Osprey, *Pandion haliaetus,* nesting on natural and artificial structures in the Kawartha Lakes, Ontario, 1991-2001. Canadian Field-Naturalist 119:58-63.

Osprey Watch Database. <http://www.osprey-watch.org/>. Accessed 1 April 2015.

Poole, A. 1981. The effects of human disturbance on Osprey reproductive success. Colonial Waterbirds 4:20-27.

Rayer, S., and Y. Wang. No date. Measuring population density for counties in Florida. <https://www.bebr.ufl.edu/articles/population-studies/measuring-population-density-counties-florida>. Accessed 1 April 2015.

Spitzer, P. R. 1980. Dynamics of a discrete coastal breeding population of Ospreys (*Pandion haliaetus*) in the northeastern United States during a period of decline and recovery, 1969-1978. PhD dissertation, Cornell University, Ithaca, New York.

Washburn, B. E. 2014. Human-Osprey conflicts: industry, utilities, communication, and transportation. Journal of Raptor Research 48:387-395.

Watts, B. D., and B. J. Paxton. 2007. Ospreys of the Chesapeake Bay: population recovery, ecological requirements, and current threats. Waterbirds 30 (Special Publication 1):39-49.

Westall, M. A. 1983. An Osprey population aided by nest structures on Sanibel Island, Florida. Pages 287-291 *in* Biology and Management of Bald Eagles and Ospreys: Proceedings of the 1st International Symposium on Bald Eagles and Ospreys, Montreal, 28-29 October, 1981 (D. M. Bird, Ed.). Harpell Press, Ste Anne de Bellevue, Quebec.