

Request to evaluate the status of the osprey of Monroe County (*Pandion haliaetus*)

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Introduction

Scientific and common name of the species to be evaluated

Osprey of Monroe County, *Pandion haliaetus*

The procedures for listing species on Florida's Endangered and Threatened List (Rule 68A-27.0012, F.A.C.) or removing species from the list stipulate that species may be petitioned through a species evaluation request submitted by the public or Florida Fish and Wildlife Conservation Commission (FWC) staff. Requests must include sufficient information on the biology and distribution of the species to warrant investigation of its status using the criteria contained in the definition of a State-designated Threatened species. A biological score calculated using the process described by Millsap et al. (1990) is only necessary for requests to evaluate for listing.

The osprey of Monroe County was assigned Species of Special Concern status by the FWC in 2011 (FWC 2011). The Listing Recommendation stated that "staff recommends listing the southern coastal osprey population as a Species of Special Concern until more information has been gathered about whether it is a distinct population and about its true geographic range" (FWC 2011).

A recent study (Dellinger et al. 2016) concluded that ospreys in southern Florida are not genetically distinct from ospreys elsewhere in the state. Based on the results of this study and on continental-level genetic analyses (C. Viverette, unpublished data; Monti et al. 2015), I am requesting that the FWC review and evaluate the status of ospreys in Monroe County (osprey; *Pandion haliaetus*), under the provisions established in Rule 68A-27.0012, F.A.C., to determine whether it is appropriate to remove the osprey from the list of Species of Special Concern (SSC; Rule 68A-27.005, F.A.C.).

Biological Information

Life history

The osprey is a large, long-winged raptor that occupies coastal and inland waterbodies throughout Florida. Ospreys are piscivorous, and they typically build nests within 10 to 20 km of shallow waters used for foraging (Ogden 1977, Bierregaard et al. 2016). Ospreys build bulky nests of sticks on trees (live or dead), artificial structures, or islands free from mammalian predators (Ogden 1977, Bierregaard et al. 2016).

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Range/distribution and taxonomy

The osprey is a cosmopolitan species that occurs in each biogeographical region except Antarctica (Monti et al. 2015). There are four recognized subspecies of osprey (Prevost 1983, Bierregaard et al. 2016):

1. *Pandion haliaetus carolinensis* (North America), which is migratory except in south Florida,
2. *P. h. ridgwayi* (portions of Cuba and the Bahamas, and the coast of southeastern Belize and Mexico), which is non-migratory,
3. *P. h. haliaetus* (Eurasia), which includes both migratory and sedentary populations,
4. *P. h. cristatus* (Australia and the southwestern Pacific), which is non-migratory.

Most osprey in North America winter in Central and South America (Lott 2006, Bierregaard et al. 2016), but osprey breeding in coastal southern Florida (i.e., primarily Monroe county) are believed to be non-migratory residents (Poole 1989, Ogden 1996, Houghton and Rymon 1997). Experts have suggested that osprey in coastal southern Florida are taxonomically affiliated with *P. h. ridgwayi* (J. Ogden, personal communication; S. Bass, personal communication) because of their physical similarities (e.g., smaller size, pale plumage), and their non-migratory status. Non-migratory, winter-nesting ospreys in Monroe County also differ in their breeding phenology compared to ospreys elsewhere in Florida, which breed in late winter or spring (Bass and Kushlan 1982, FWC 2003). The observed differences in migratory patterns and breeding phenology led the Biological Review Group to conclude that there may be two distinct subpopulations of osprey in Florida (FWC 2011). FWC staff recommended retaining the osprey of Monroe County as a Species of Special Concern until further information became available concerning the uniqueness of this southern coastal population.

In 2014, Dellinger and colleagues (2016) collected osprey feathers from throughout peninsular Florida to investigate if the southern coastal osprey population is genetically distinct. Based on analysis of nuclear genetic markers, the authors did not find significant population structure related to either latitude or nesting phenology in Florida. This finding is consistent with continental-scale analyses, which found little or no genetic structure among osprey populations (C. Viverette, unpublished data; Monti et al. 2015). Although sample sizes were small, Monti and colleagues (2015) found shared mitochondrial DNA haplotypes between Caribbean samples and samples from the United States, suggesting that *P. h. carolinensis* and the non-migratory *P. h. ridgwayi* may not be genetically distinct.

Population status and trend

Poole (1989) estimated only 20,000 breeding pairs in North America in the early 1980s. Since that time, the osprey population in North America has increased significantly, and current estimates suggest 310,000 individuals in the United States and Canada (Rosenberg et al. 2016).

Among the contiguous 48 states, Florida, Maine, Virginia, and Maryland have the largest osprey populations (Houghton and Rymon 1997, Bierregaard et al. 2016). Ospreys are widespread in Florida, and the state contains two of the densest breeding colonies in the world (McMillian 2013, Bierregaard et al. 2016). Houghton and Rymon (1997) estimated 2,500 – 3,000 breeding pairs in Florida in 1994, but the population has grown since that time to perhaps 3,500-4,000 pairs (FWC 2011). Breeding Bird Survey data also suggest an increasing population in Florida over both the long (1966-2015) and short (2005-2015) term (Sauer et al. 2017).

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In contrast, the resident southern coastal osprey subpopulation has declined steadily since the early 1970s. The number of breeding pairs in Florida Bay declined 58% from 1973 to the early 1980s (Kushlan and Bass 1983). More recently, osprey in Florida Bay declined from 136 pairs in 1980 (Kushlan and Bass 1983) to 60 pairs in 2007 (S. Bass, unpublished data), a 56% decline over a 27-year period. Osprey are also thought to be declining in the lower Florida Keys (T. Wilmers, personal communication), though recent count data are not available. Long-term data indicate that Florida Bay contains 50-70% of the Monroe County population of ospreys (S. Bass, unpublished data), so the Biological Review Group (FWC 2011) conservatively estimated the county-wide population at 100 – 150 pairs.

Threats Summary

The Biological Review Group concluded that the osprey in Monroe County met multiple criteria for listing, including Population Size Reduction (criteria A2, A3, and A4), Population Size and Trend (criteria C1 and C2), and Population Very Small or Restricted (criterion D1) (FWC 2011). As noted above, the population in Florida Bay declined by 56% from 1980 to 2007, and the current conservative population estimate is only 100-150 pairs (S. Bass, personal communication; Kushlan and Bass 1983). The observed decline has not ceased and is expected to continue (FWC 2011). The decline is not well understood but is likely tied to the health of the Everglades ecosystem (FWC 2013). Osprey productivity is closely tied to prey abundance, productivity declines have been associated with reduced fish supplies (Bowman et al. 1989, Fleming et al. 1989), and it is possible that the observed decline in Florida Bay is due to food stress (Kushlan and Bass 1983, Bowman et al. 1989). Hypersalinity from reduced freshwater inflow into Florida Bay may be responsible for reduced availability of prey (McIvor et al. 1994). Also, there is concern regarding exposure to heavy metals, especially methyl mercury, due to biomagnification in prey items. In a statewide study, Rumbold and colleagues (2017) found that mercury concentrations in nestlings were highest in coastal areas of Collier and Monroe counties. Mercury has been measured in tissues of juvenile and adult ospreys from Florida Bay at levels associated with reduced reproductive success (Lounsbury-Billie et al. 2008).

The Biological Review Group concluded that the osprey in Monroe County did not meet the listing criterion associated with Geographic Range (criterion B). Ospreys in Monroe County have a limited extent of occurrence. However, the area of occurrence is not fragmented, and the osprey's distribution and population size do not undergo extreme fluctuations (FWC 2011).

The Species Action Plan (FWC 2013) and Biological Review Group (FWC 2011) identified several additional threats for ospreys in Monroe County. Interspecific interactions with bald eagles (*Haliaeetus leucocephalus*) can result in a decline in osprey nests and nesting success in Florida Bay (Ogden 1975). Eggs and young are vulnerable to predators like raccoons (Fleming et al. 1989, Poole 1989, Ewins 1997) and adverse weather. Habitat loss due to development may impact the availability of natural nesting habitat, and ospreys have become more reliant on man-made structures for nesting opportunities. Although most nesting occurs outside of tropical storm season, the impacts of tropical storms and hurricanes is unclear. It is possible that storms may actually create additional nesting opportunities by opening the canopy (M. Westall, The International Osprey Foundation, personal communication). Although ospreys can become desensitized to human disturbance (Rodgers and Schwikert 2003, Washburn 2014), it is possible that human disturbance could be an issue for ospreys nesting in backcountry areas. Both adults and young are vulnerable to ingestion or entanglement in fishing gear (FWC 2013), and adult mortality results from collisions with man-made structures (Poole and Agler 1987, Deem et al.

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1998), as well as electrocutions and collisions with vehicles (A. Barber, personal communication). Direct persecution by shooting of osprey in Monroe County still occurs but is rare (A. Barber, personal communication). Changes in climate could have severe impacts on ospreys in Monroe County, with much of the Florida Keys expected to be inundated due to rising sea level (Zhang et al. 2011).

Conclusion

Genetic analyses in Florida (Dellinger et al. 2016), combined with preliminary analyses at the continental scale (C. Viverette, unpublished data; Monti et al. 2015), suggest that ospreys in Monroe County are not genetically distinct from those elsewhere in Florida. Although the osprey population in Monroe County continues to decline, the overall Florida population is stable or increasing. Based on new genetic analyses, a re-evaluation of the listing status of the osprey in Monroe County is warranted.

Literature Cited

- Bass, Jr., O. L., and J. A. Kushlan. 1982. Status of the osprey in Everglades National Park. South Florida Research Center Report M-679. 28 pp.
- Bierregaard, R. O., A. F. Poole, M. S. Martell, P. Pyle and M. A. Patten. 2016. Osprey (*Pandion haliaetus*). The Birds of North America online. P. G. Rodewald, editor. Cornell Lab of Ornithology. <https://birdsna.org/Species-Account/bna/species/osprey>. Accessed 12 April 2017.
- Bowman, R., G. V. N. Powell, J. A. Hovis, N. C. Kline and T. Wilmers. 1989. Variations in reproductive success between subpopulations of the osprey (*Pandion haliaetus*) in south Florida. Bulletin of Marine Science 44: 245-250.
- Deem, S. L., S. P. Terrell, and D. J. Forrester. 1998. A retrospective study of morbidity and mortality of raptors in Florida: 1988 – 1994. Journal of Zoo and Wildlife Medicine 29: 160 – 164.
- Dellinger, T. A., K. E. Miller, and C. B. Viverette. 2016. Genetics and conservation significance of osprey in Southern Florida. Final Report, Florida's State Wildlife Grants Program. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 50pp.
- Ewins, P. J. 1997. Osprey (*Pandion haliaetus*) populations in forested areas of North America: changes, their causes and management recommendations. Journal of Raptor Research 31: 138-150.
- Fleming, D. M., N. C. Kline, W. B. Robertson, Jr. 1989. A comparison of osprey nesting distribution, abundance and success: Florida Bay USA from 1968 – 1984. Bulletin of Marine Science 44:517.
- Florida Fish and Wildlife Conservation Commission. 2003. Florida's breeding bird atlas: A collaborative study of Florida's birdlife. <http://www.myfwc.com/bba/>. Accessed 13 April 2017.
- Florida Fish and Wildlife Conservation Commission. 2011. Osprey biological status review report, March 31, 2011. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 14 pp.

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- Florida Fish and Wildlife Conservation Commission. 2013. A species action plan for the osprey of Monroe County. Tallahassee, Florida.
- 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.
- Kushlan, J. A., and O. L. Bass, Jr. 1983. Decreases in the southern Florida osprey population, a possible result of food stress. Pp. 187-200 *in* Biology and management of bald eagles and osprey (D.M. Bird, Ed.). MacDonald Raptor Research Centre, McGill University, Raptor Research Foundation, Inc. Quebec, Canada.
- Lott, C. A. 2006. A new raptor migration monitoring site in the Florida Keys: counts from 1999-2004. *Journal of Raptor Research* 40: 200-209.
- Lounsbury-Billie, M. J., G. M. Rand, Y. Cai, and O. L. Bass. 2008. Metal concentrations in osprey (*Pandion haliaetus*) populations in the Florida Bay estuary. *Ecotoxicology* 17: 616-622.
- McIvor, C. C., J. A. Ley, and R. D. Bjork. 1994. Changes in freshwater inflow from the Everglades to Florida Bay including effects on biota and biotic processes: A review. Pages 117-146, *in* Everglades: the ecosystem and its restoration. S. M. Davis and J. C. Ogden, editors. St. Lucie Press, Boca Raton, Florida.
- McMillian, M. A. 2013. Long-term trends in osprey (*Pandion haliaetus*) nesting populations on Lake Istokpoga, Florida. *Florida Field Naturalist* 41:71-79.
- Millsap, B. A., J. A. Gore, D. E. Runde, and S. I. Cerulean. 1990. Setting priorities for the conservation of fish and wildlife species in Florida. *Wildlife Monographs* 111:1-57.
- Monti, F., O. Duriez, V. Arnal, J.-M. Dominici, A. Sforzi, L. Fusani, D. Gremillet, and C. Montgelard. 2015. Being cosmopolitan: evolutionary history and phylogeography of a specialized raptor, the osprey *Pandion haliaetus*. *BMC Evolutionary Biology* 15:255.
- Ogden, J. C. 1975. Effects of bald eagle territoriality on nesting ospreys. *Wilson Bulletin* 87: 496-505.
- Ogden, J. C. 1977. Transactions of the North American Osprey Research Conference. U.S. Department of the Interior, National Park Service Transactions Proceedings Series No. 2.
- Ogden, J. C. 1996. Osprey (*Pandion haliaetus*). Pp. 170-178 *in* Rare and endangered biota of Florida, Volume V. Birds. J. A. Rodgers, Jr., H. W. Kale II, and H. T. Smith, editors. University Press of Florida, Gainesville.
- Poole, A. F. 1989. Ospreys: a natural and unnatural history. Cambridge University Press, Cambridge, United Kingdom.
- Poole, A. F., and B. Agler. 1987. Recoveries of ospreys banded in the United States, 1914-84. *Journal of Wildlife Management* 51: 148 – 155.

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- Prevost, Y. 1983. Osprey distribution and subspecies taxonomy. Pp. 157-174 *in* Biology and management of bald eagles and ospreys. D. M. Bird, editor. Harpell Press, Ste. Anne de Bellevue, Quebec.
- Rodgers, J. A., and S. T. Schwikert. 2003. Buffer zone distances to protect foraging and loafing waterbirds from disturbance by airboats in Florida. *Waterbirds* 26: 437 – 443.
- Rosenberg K. V., J. A. Kennedy, R. Dettmers, R. P. Ford, D. Reynolds, J. D. Alexander, C. J. Beardmore, P. J. Blancher, R. E. Bogart, G. S. Butcher, A. F. Camfield, A. Couturier, D. W. Demarest, W. E. Easton, J. J. Giocomo, R. H. Keller, A. E. Mini, A. O. Panjabi, D. N. Pashley, T. D. Rich, J. M. Ruth, H. Stabins, J. Stanton, and T. Will. 2016. Partners in flight landbird conservation plan: 2016 revision for Canada and Continental United States. Partners in Flight Science Committee.
- Rumbold, D. G., K. E. Miller, T. A. Dellinger, and N. Haas. 2017. Mercury concentrations in feathers of adult nestling osprey (*Pandion haliaetus*) from coastal and freshwater environments of Florida. *Archives of Environmental Contamination and Toxicology* 72:31-38.
- Sauer, J. R., D. K. Niven, J. E. Hines, D. J. Ziolkowski, Jr, K. L. Pardieck, J. E. Fallon, and W. A. Link. 2017. The North American Breeding Bird Survey, Results and Analysis 1966 - 2015. Version 2.07.2017 USGS Patuxent Wildlife Research Center, Laurel, MD.
- Washburn, B. E. 2014. Human-osprey conflicts: industry, utilities, communication, and transportation. *The Journal of Raptor Research*. 48:387-395.
- Zhang, K., J. Dittmar, M. Ross, and C. Bergh. 2011. Assessment of sea level rise impacts on human population and real property in the Florida Keys. *Climate Change* 107:129-146.