Using Satellite Telemetry to Reduce Risk of Osprey Collisions with Military Aircraft

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A true conservation success story, Osprey (*Pandion haliaetus*) populations in North America have staged a dramatic recovery during the past few decades. Expanding Osprey populations are the direct result of the banning of harmful pesticides (most notably DDT), conservation efforts that provided suitable nesting structures, and the implementation of successful translocation and hacking programs.

However, with conservation success comes new challenges. Osprey exhibit a remarkable tolerance to humans and adapt well to urban environments. Breeding populations of Osprey adjacent to military airbases and civil airports increase the risk of collisions between Osprey and aircraft. As North American Osprey migrate to their wintering areas in central and South America, they traverse numerous military airspace use areas. The risks to human safety and damage to aircraft associated with Osprey-aircraft collisions are a serious flight safety concern, highlighting the need for research and management efforts designed to mitigate such risk.

Supported by the U.S. Department of Defense's Legacy Natural Resources Management Program, a collaborative multi-agency research effort was initiated in 2006. The goal of this research project is to incorporate satellite telemetry technologies and geo-spatial referencing to quantify bird-strike risk of migrating and breeding Osprey from the Mid-Atlantic Chesapeake Bay Region.

The study area is located in the Back River of the Chesapeake Bay adjacent to Langley Air Force Base (AFB) in Virginia. During the 2006 and 2007 nesting seasons, we captured 13 adult Osprey (5 males and 8 females) using carpet-noose traps at their nests. Amongst this group, we successfully captured and satellite-tagged three breeding pairs.

Each Osprey was fitted with unique color and U.S. Fish and Wildlife Service leg bands, tagged with a 30g Argos/GPS PTT-100, and released at the nest site. We attached the transmitters in a backpack configuration using a Teflon tape harness. The satellite transmitters were programmed to collect location and movement information 10 times each day (at 2 hour intervals).

Using the fine-scale GPS location data, we are gaining new insights into Osprey breeding ecology. This information will provide us with a better understanding of the movements, activity patterns, and habitat use of male and female adult Osprey during their breeding season. We have learned that adult Osprey are active relatively equally during daylight hours.

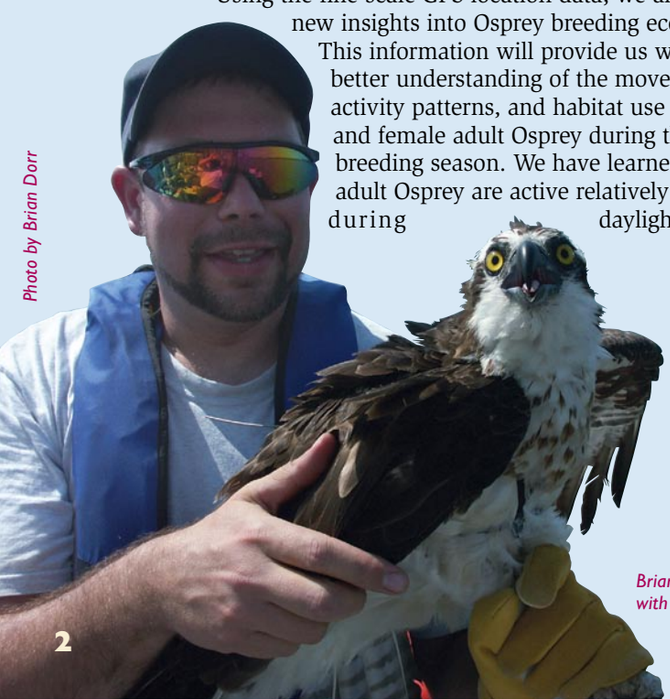


Photo by Brian Dorr

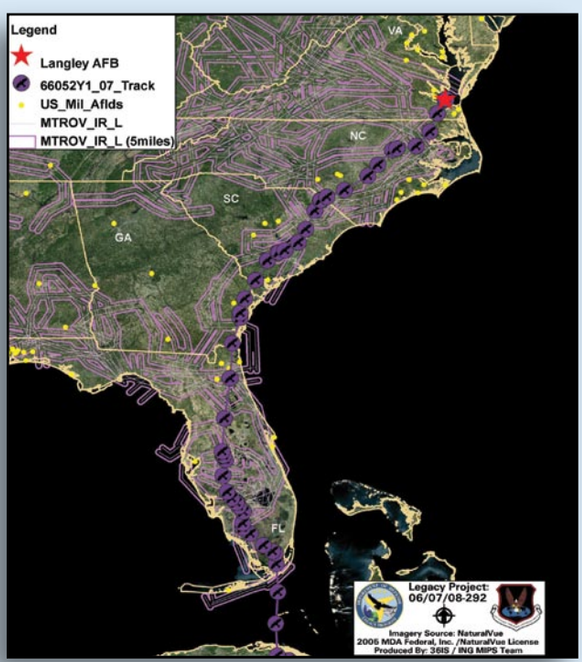
Brian Washburn with tagged Osprey.

We found that female Osprey that breed in Virginia began their fall migrations in August; males typically began migrating in September. Breeding pairs of Osprey do not migrate or winter together. Osprey migrated during daylight hours and roosted at night. Seven Osprey completed their fall migration to their wintering grounds in the Caribbean or in South America, traveling an average distance of 4,600 km. We lost contact with six Osprey during their fall migration; the fate of these birds is unknown. All 13 Osprey utilized similar migration routes along the eastern coast of the U.S. and traveled from Florida to Cuba. With a better understanding of Osprey migration patterns and stopover habitats, conservation and management efforts for this species can be enhanced.

From breeding season data, we are constructing spatial and temporal models of how breeding Osprey utilize areas within their nesting territories. These models will be analyzed to determine whether predictive relationships exist among Osprey movement patterns, the occurrence of Ospreys on Langley AFB, and the critical airspaces used by military aircraft during flight operations. In addition, movement and activity patterns of breeding Osprey will be used to identify locations where nesting Osprey present the greatest risk to aircraft operations.

Spatial and temporal patterns of Osprey migration, including specific migratory routes, will be mapped and summarized using information provided by the GPS PTTs. Flight characteristics and geographic routes of migrating Osprey will be compared with airfields and military flight operation areas along the Atlantic seaboard to determine periods of increased risk of Osprey military aircraft collisions. Ultimately, using information provided by this research effort, the timing and routing of military training flights might be scheduled to reduce the risk of Osprey aircraft collisions.

Only through science-based research can we identify specific hazards and evaluate the risk that breeding and migrating Osprey pose to military flight operations. This research also has applications for measuring the effectiveness of current Osprey-conflict management practices and for developing long-term management strategies that would allow Osprey and military aircraft to co-exist in a safer flying environment.



Fall migration route of M52, an adult male Osprey, from Langley Air Force Base, Virginia in 2007. He passed by several military airfields (yellow dots) and through numerous military training routes (lines and 5 mile buffers).