



Assessing BASH Risk Potential of Migrating and Breeding Ospreys in the Mid-Atlantic Chesapeake Bay Region

Project 08-292

Background:

Recovery and expansion of Osprey (*Pandion haliaetus*) populations in North America in recent years has resulted in an increased bird aircraft strike hazard (BASH) risk potential within the mid-Atlantic region of the Chesapeake Bay and along the eastern seaboard. In 2006, the 1st Fighter Wing at Langley Air Force Base (LAFB) and a multi-agency study team embarked on an innovative research effort to assess BASH risk of breeding and migrating Ospreys.

Objective:

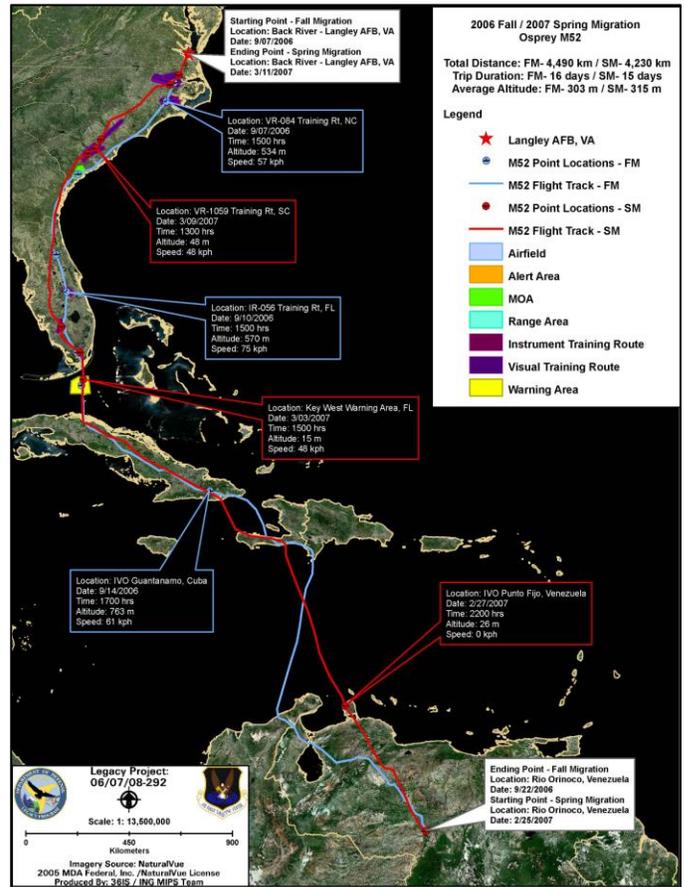
To assess BASH risk the objectives of this project were to determine the migratory patterns in relation to flight operations, airfield occurrence in relation to breeding territories, and fidelity towards breeding territory, nest, and mate in relation to management practices.

Summary of Approach:

The project encompassed a collaborative effort where breeding adult and nestling Osprey were live-captured, fitted with satellite transmitters, and released from selected nest sites near LAFB. Satellite tracking technology was used to monitor the movements of 13 adult Osprey fitted with miniature solar powered global position system transmitters. Geo-spatial analysis was used to evaluate specific Osprey location data that had the potential to penetrate military training airspace (MTA) and pose a threat to aviation safety and aircraft missions

Accomplishments:

During 2006–2009, over 19,200 individual Osprey locations were acquired, grouped into biological and BASH datasets, and analyzed. When examined across the breeding season, Osprey activity varied by month and by gender. Adult male Ospreys were active throughout the breeding season, whereas female Osprey activity was highest in July and August. Ospreys were active during daylight hours, typically from 0900 to 1700 hrs. Reproductive success greatly influenced Osprey activity and spatial use patterns.



Data collected during migration provided specific information on Osprey timing, routes, and flight characteristics. During fall and spring migration, Ospreys fly at a speed of 25 mph and at an altitude of 1,150 feet. Ospreys traveled an average of 125 miles per day during migration. Each Osprey migrated during daylight hours following similar routes from or to their breeding (nesting) territories at LAFB along the Atlantic Coast and across the Caribbean Sea to or from their wintering grounds.

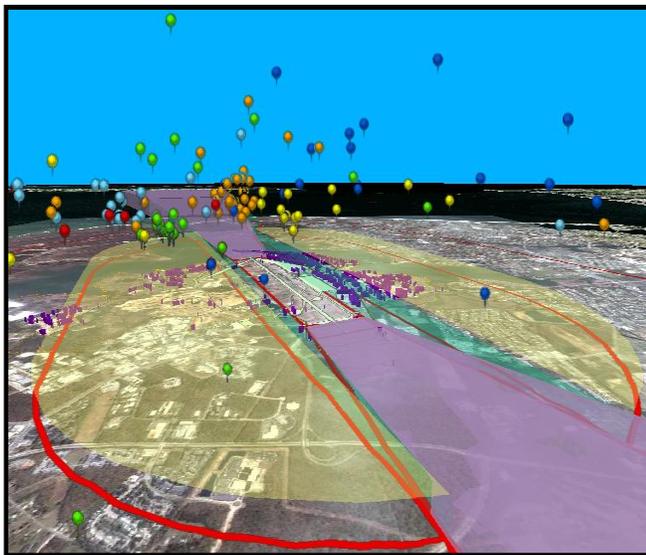
Ospreys wintered in the Caribbean or in South America, typically within isolated forested habitats near a major water source. During their wintering period, both male and female Ospreys utilized relatively small areas and were very sedentary.



Osprey location and movement data obtained during the breeding season was cross-referenced with critical airspace used by military aircraft operating at LAFB, allowing for the quantification of Osprey BASH risk and identification of temporal and spatial patterns of risk.

On average, breeding Ospreys were 'at risk' for a collision with military aircraft 3% of the times they were located by the satellite tracking system. However, when only those locations when the bird was moving are considered, the BASH risk potential for individual Ospreys ranged from 5% to 45% of the time.

Digital aeronautical flight information of MTA was used to evaluate the BASH risk of Ospreys during their fall and spring migrations. On average, actively migrating Ospreys were 'at risk' for a collision with military aircraft 35% of the times they were tracked by the satellite system. When Osprey migratory locations are converted to a flight track, Ospreys made at least 61 incursions into MTA per migration. A total of 143 individual MTA with one or more incursions were identified along the eastern seaboard. Military training routes were most frequently incurred by migration Ospreys.



Three dimension view of at risk balloon locations of individual Osprey within the Langley Air Force Base controlled airspace.

Benefit:

Although much is known about the ecology of Ospreys, the potential impacts to aircraft safety and military flight operations were relatively unknown. According to BASH data collected by the Air Force Safety Center 25% of Osprey-aircraft strikes have forced the pilots to abort the mission and have caused more than \$1.3 million cumulative damages to aircraft. Ospreys are widely distributed across North America with thriving breeding populations including Patuxent River Naval Air Station, Marine Corps Air Station Cherry Point, and Tyndall Air Force Bases, in addition to many other airbases. During migration Ospreys are now known to intersect a variety of training airspace including Visual Route 1006 in Florida, Instrument Route 062 in Virginia, Slow Route in South Carolina, Alert Area 2901 in Florida, Beaufort Military Operations Area in South Carolina, and Warning Area 465 in Florida.

This project used advanced satellite tracking technologies and an operational risk management-like process to quantify BASH risk potential of Ospreys during their breeding and migratory periods. Similar satellite tracking studies have spawned from this project and are in place for Bald Eagles, Canada Geese, and Red-tailed Hawks. The value of incorporating this information into mission planning systems such as the bird avoidance model and avian hazard advisory system is unprecedented. The future technology for monitoring the paths of migratory birds using GPS transmitters and avian radars will undoubtedly strengthen the initial operational risk management steps while allowing pilots, mission planners, and natural resource managers to make informed decisions to mitigate bird-aircraft strike damage and limit the negative impacts to mission readiness.

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