

# UC Agriculture & Natural Resources

## Proceedings of the Vertebrate Pest Conference

### **Title**

Cooperative mitigation of wildlife attractants between an Air Force base and the local community

### **Permalink**

<https://escholarship.org/uc/item/2231b6d6>

### **Journal**

Proceedings of the Vertebrate Pest Conference, 21(21)

### **ISSN**

0507-6773

### **Author**

Gray, Michelle

### **Publication Date**

2004

# Cooperative Mitigation of Wildlife Attractants between an Air Force Base and the Local Community

Michelle Gray

USDA Wildlife Services, Seymour Johnson Air Force Base, North Carolina

**ABSTRACT:** Seymour Johnson Air Force Base (SJAFB), North Carolina lies within the Atlantic Flyway waterfowl migration corridor and is home to the 4<sup>th</sup> Fighter Wing (4FW), with 4 fighter squadrons and 2 training units, and the tenant 916<sup>th</sup> Air Refueling Wing (916 ARW), operating 10 KC-135R Stratotankers. To allow the 4FW and 916 ARW to continue their operations at SJAFB, the City of Goldsboro must maintain the safety of the military's assets. This includes ensuring that land usage within a 5-mile radius of the base is compatible with safe flight operations (e.g., areas should not attract large populations of birds). Over the last 3 years, \$4 million in damage to SJAFB aircraft was caused by duck, goose, gull, and vulture strikes. These birds are known to utilize wetlands, ponds, and quarries surrounding the base. With populations of these birds increasing around SJAFB, the addition of incompatible land uses could cause the city and surrounding region to lose \$340 million per year in revenue if the base was to relocate due to safety concerns related to striking birds. The economic value of the base has helped prompt city officials to coordinate with the base before granting permits for new land uses. The city also has recognized the need to reduce the abundance of birds currently using the wetlands and ponds adjacent to the SJAFB airfield.

**KEY WORDS:** Air Force, bird strike, gravel pits, mitigation, vultures, waste water treatment ponds, waterfowl, wetlands, wildlife

Proc. 21<sup>st</sup> Vertebr. Pest Conf. (R. M. Timm and W. P. Gorenzel, Eds.)  
Published at Univ. of Calif., Davis. 2004. Pp. 302-305.

## INTRODUCTION

Wildlife utilize airfield environments because of the diverse natural and man-made habitats that provide food, water, and shelter. Much of this wildlife does not pose a hazard to air traffic safety; however, species such as blackbirds, waterfowl, gulls, deer, and foxes can exacerbate or directly pose hazards to air traffic safety. When habitat conditions become conducive to the proliferation of bird and mammal populations, the potential for a wildlife strike increases. Strikes between aircraft and wildlife can cause considerable monetary damage to aircraft, and in some cases, the loss of aircraft and human life.

Seymour Johnson Air Force Base (SJAFB), North Carolina, has numerous species of birds and mammals utilizing the facility because it possesses diverse natural and man-made habitats that provide food, water, and shelter. Some of the birds, mammals, and habitat located on and surrounding SJAFB pose significant hazards to aircraft safety. Over the last 3 years, \$4 million in damage to SJAFB aircraft was caused by bird strikes (Gray 2004). Because of the base's desire to reduce the number and resulting costs of bird strikes to their aircraft, the Airfield Maintenance and Flight Safety Offices decided to establish a proactive Bird/Wildlife Aircraft Strike Hazard (BASH) program.

SJAFB is home to the 4<sup>th</sup> Fighter Wing (4FW) and the 916<sup>th</sup> Air Refueling Wing (916 ARW). The 4FW consists of two Fighter Squadrons and two Formal Training Units that combine for a total of 98 F-15E Strike Eagles, considered to be the most advanced tactical fighter aircraft in the world. The 916 ARW has 10 KC-135R Stratotankers and supports routine refueling missions for other Air Force, Navy, and Marine Corps aircraft under the direction of 22<sup>nd</sup> Air Force and Headquarters, Air Force Reserve Command.

These fighter jets and tankers spend a large portion of their time training within the city limits of Goldsboro, North Carolina, the county seat of Wayne County. Goldsboro is proud to have SJAFB located within its city limits, but the city also has land uses with BASH hazards near the base that are incompatible with safe flight operations. The city operates a wastewater treatment facility off the west end of the airfield, which has several holding ponds that are 5 feet deep and cover 177 acres. In addition to the ponds, the city recently constructed wetlands northwest of SJAFB, consisting of 4 ponds with water levels in most places between 1 and 3 feet. In addition to the close proximity of the wastewater treatment ponds and 40-acre wetlands to the base, several hog farms are nearby, the closest of which borders the south side of the airfield. Southwest of the airfield lies an active gravel quarry and sandpit area. Immediately east of the base are woodlands, several farms, and numerous restaurants.

## FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR

In 1997, the Federal Aviation Administration (FAA) released an Advisory Circular that provided recommendations on habitat types that should not be located within a 5-mile radius of an airport, due to the potential for bird strikes that these habitat types may cause (USDOT 1997). The Advisory Circular recommended that any known wildlife attractants should be situated at least 5 miles away from the airport so there is no hazardous wildlife movement into or across the approach or departure airspace. Specifically mentioned are wastewater treatment facilities and wetlands, and the FAA recommends correcting any wildlife hazards arising from existing wastewater treatment facilities on or near airports using appropriate wildlife hazard mitigation techniques. Due to

the existing City of Goldsboro wastewater treatment ponds and wetlands and their location within the 5-mile radius around SJAFB, it has become imperative that the base address wildlife hazards not only on, but also off, the airfield.

### WASTE WATER TREATMENT PONDS AND WETLANDS

The City of Goldsboro operates a wastewater treatment facility adjacent to SJAFB as well as a newly constructed wetland facility 1.5 miles northwest of the base. The wetland facility was constructed after the city qualified for a \$1.6-million grant from the state's Clean Water Management Trust Fund. The purpose of this grant was to conduct a 4-year study to determine the feasibility of using constructed wetlands to reduce nitrogen levels in treated wastewater before discharging it back into the Neuse River (the Neuse River lies entirely within North Carolina and serves as one of the country's most important fish nurseries).

Because aircraft from SJAFB typically pass over the ponds and wetlands at altitudes ranging from 200 to 1500 feet, the birds that frequent these areas can have serious impacts on flight safety. Of the birds that currently inhabit these areas, Canada geese (*Branta canadensis*) pose the biggest threat to flight safety at the base. Since 1985, Canada geese rank as the second-most-costly bird that the Air Force strikes, at a total cost of \$85 million, or \$1.2 million in damage per strike (USAF 2004). Currently, there are over 200 resident Canada geese utilizing the wastewater treatment ponds and associated wetlands. A conservative view of the projected goose population estimates that 900 Canada geese could be utilizing the ponds and wetlands by 2007 if no management activities take place prior to then. As a result, these geese pose a very real hazard to flight operations at SJAFB.

Ducks (*Anas* spp.) and tundra swans (*Cygnus columbianus*) also pose a threat to flight safety at SJAFB. Ducks do not cause as much damage to aircraft as geese do; however, Air Force statistics state that ducks are struck more often than geese (USAF 2004). Over 1,000 migratory ducks use the wastewater treatment ponds and wetlands as their over-wintering site annually, and as a result, the potential for duck strikes during this time frame increases. Tundra swans also are beginning to become attracted to the newly established wetland area; this past season, 5 tundra swans made the wetlands their over-wintering site.

Flocks of over 60,000 European starlings (*Sturnus vulgaris*) and common grackles (*Quiscalus quiscula*) have been observed roosting for the last decade around the City of Goldsboro. Because of the attractiveness of wetlands to these birds, the city wetlands may eventually become utilized by these birds for staging or feeding purposes. This situation occurred at Whiteman Air Force Base in Missouri. After wetlands near their airfield environment matured and became established with cattails, tens of thousands of starlings and blackbirds began utilizing this site on a daily basis (Todd Stewart, USDA WS, pers. commun.).

Understanding that the City of Goldsboro's wetland project could not be terminated and that it was not only beneficial to the city's waste water treatment facility but also to the long-term survival of the Neuse River ecosystem, SJAFB had to find a way to convey their concerns to the city about the potential for a damaging strike with birds from the wetlands as well as the waste water treatment ponds. The mayor and city manager agreed to meet with military and USDA Wildlife Services personnel to discuss reasons why the ponds and wetlands were hazardous to SJAFB and the local community. Their initial response to these concerns was to state that SJAFB had not hit one of these birds directly over their facilities before, so they were not inclined to think that SJAFB would incur a bird strike as a result of their hazards. This theory was challenged in February 2004, when a KC-135R struck a duck on takeoff over the wastewater treatment ponds. The strike was damaging, but fortunately, the plane landed without incident. The city ultimately gained an understanding about the likelihood of a disastrous strike with ducks, geese, starlings, or blackbirds as a result of the ponds and wetlands being located within 5 miles of SJAFB. City personnel also have come to understand that the base not only was concerned about losing a multi-million dollar aircraft, but also was concerned about losing a human life (both military and civilian). Elmendorf Air Force Base, Alaska, lost 24 military personnel in 1995 after an Airborne Warning and Control System (AWACS) aircraft ingested 4 Canada geese into two engines during takeoff (Cleary and Dolbeer 1999). It was fortunate that no civilian lives on the ground were lost since the AWACS aircraft crashed off base.

After gaining the city's respect for the position that SJAFB took regarding BASH hazards at the ponds and wetlands, the base worked with the city to demonstrate which actions would be appropriate to take to reduce the number of birds currently utilizing the ponds and wetlands. SJAFB requested that the city continually monitor these areas for bird activity until the bird hazards were mitigated. Suggestions to the city about various techniques to mitigate these hazards included acquiring border collies to haze geese from the area, installing a grid wire system over the ponds, and eliminating invasive plant species such as cattails from the wetlands. To date, the city has implemented two of the mitigation techniques. They acquired two border collies from the local animal shelter, and they currently run these dogs at the wetlands during the timeframe that is provided by the base (i.e., at the beginning of each week, an improvised version of the base flying schedule is provided to the city so that they only haze geese when all aircraft are on the ground or out of the immediate area). The city also has begun working with numerous contractors on the best methods for removing established cattails from their wetlands and for preventing cattail growth at this site in the future.

### GRAVEL PITS

The FAA Advisory Circular (USDOT 1997) included surface mining and gravel pits as possible wildlife



attractants. Gravel pits are often seen as a compatible land-use development around airports, and these areas often do not become a problem while the area is actively being mined. Following the conclusion of mining, however, these areas have the potential to become water-impounded bird sanctuaries and subsequently to cause serious hazards to flight operations (Gates 2003).

This was the concern that was expressed by both the City of Goldsboro and SJAFB when they learned that a sand and gravel company had purchased a 5-acre area approximately 1.1 miles southeast of the west end centerline of SJAFB and intended to use this area to excavate sand. Once this project was complete, the sand and gravel company discussed the possibility of flooding the area for recreational fishing purposes. As a result, this site had the potential to become a direct encroachment to flight operations at SJAFB because it is located directly beneath the SJAFB air traffic pattern. Both F-15E Strike Eagles and KC-135R Stratotankers fly over this site at 300 to 800 feet elevation every few minutes throughout the day. Increased bird activity in this area would create a bird hazard that would directly endanger aircrew and cost the Air Force assets in bird damage repair.

Due to the city's desire to become better neighbors to SJAFB, the city required the sand and gravel company to meet with the base before granting a permit for this proposed land use. The base then required the company to compose a letter addressing two points; the letter needed to address how the company intended to carry out the project, and what the "end state" of their project would be. To aid the sand and gravel company in determining what this "end state" would be, USDA personnel and the Chief of Safety from SJAFB toured the project site and made recommendations about how to reduce the amount of standing water in the area following completion of the project. The decision was made to excavate the area to 6 feet on one end of the site and 7 feet on the other end to allow for a slope. The sand and gravel company also agreed to dig trenches to further assist with the prevention of standing water at the site. After drafting the letter stating this "end state", final approval for this project was granted by the USDA, the Chief of Safety, and the Wing Commander. The goal at SJAFB is to eliminate incompatible land use and zoning around the base, and this proposed excavation site allowed them the opportunity to proactively eliminate a threat to local flying before it started.

The continuous communication between the sand and gravel company, SJAFB, the City of Goldsboro, and the USDA was what made this project a success. The sand and gravel company was pleased that this situation benefited both themselves and SJAFB. Good relations between all the players in this project also resulted in the company's desire to reduce bird attractants at their other sites near the base.

#### **CLEAN WATER FUND WETLAND RESTORATION PLANS**

The Clean Water Management Trust Fund (CWMTF) was established to help local governments, state agencies, and conservation non-profit groups finance projects to protect and restore surface water quality. Types of

projects that are funded include stormwater management, wetlands, riparian buffer and stream restoration, acquisition of buffers, floodplains, wetlands, greenways, and agricultural best management practices. The CWMTF has awarded millions of dollars in grants to various groups and agencies since its inception, some of which has been granted to the City of Goldsboro. The most recent grant proposal is for a \$2.3-million project to restore wetlands near SJAFB. The proposal is to buy 500 undeveloped acres of land, nearly all of which is in the area with the highest potential for aircraft to have accidents. This zone extends nearly a mile off the base runway to the west. Most of this land is ditched and drained and is currently being farmed or in timber production. This area drains into a tributary of the Neuse River. One spokesman for the project said the goal would be to restore the wetlands, but it would have to be done carefully to avoid conflict with SJAFB air traffic. He specifically stated that the project would have to be coordinated closely with SJAFB personnel to avoid attracting undesirable birds to the area.

Despite the positive effects that restoring wetlands would have on the Neuse River, converting 500 acres of land to wetlands near SJAFB would increase the attractiveness of the area to waterfowl, starlings, and blackbirds. This incompatible land use could cause the base to have to relocate its operations.

SJAFB contributes \$800 million (\$340 million to the city and surrounding region) to North Carolina's economy and affects 15,000 employees every year. If SJAFB had to relocate because of a concern about their ability to conduct safe flying operations due to BASH hazards, the impacts to the state and to the City of Goldsboro would be obvious. Because neither the base nor the city wants the base to relocate, the need to evaluate this project proposal before proceeding with the restoration was discussed. As a result, the city manager asked for SJAFB and the USDA to develop a restoration plan for area. The city manager guaranteed that with this plan, the 500-acre area would not become wetlands but would instead be allowed to revert to its natural state, if feasible, or to whichever "end state" was deemed acceptable by SJAFB. Preliminary studies are now being conducted to find an acceptable "end state" for this project so that an appropriate restoration plan may be written for this area.

#### **CONCLUSION**

The location of SJAFB within the Atlantic Migratory Bird Corridor makes base aircraft susceptible to bird strikes both on and immediately surrounding the base. The location of the base near the Neuse River, the City of Goldsboro wastewater treatment ponds, and the City of Goldsboro wetlands also increases the potential for bird strikes to occur to aircraft. This divergent habitat supports a variety of bird and mammal populations, many of which present hazards to the safety of aircrews at SJAFB and are recognized as dangerous to aircraft operations. These hazards can be managed through an effective and proactive BASH program, and that is exactly what the USDA and flight safety personnel at SJAFB set out to achieve.

While it is too early to determine how successful the

communication will have been between SJAFB, USDA, and the City of Goldsboro on the 500-acre Clean Water Fund Wetland Restoration Plan, it is becoming apparent that as time goes on the City of Goldsboro continues to gain a better understanding about the need for safe flying operations at and surrounding SJAFB, especially as it pertains to BASH hazards. This understanding has been as a direct result of effective communication and efficient information transfer. Flight safety concerns relating to various land use issues around SJAFB were clearly expressed to the City of Goldsboro personnel both in writing as well as through verbal communication.

To ensure cooperative mitigation of wildlife attractants between SJAFB and the City of Goldsboro, the base has focused on work intent, good relations between the two entities, and the implementation of a wildlife management plan in areas where wildlife hazards already occur. The base now requests written statements of work intent from the city or other contractors wishing to utilize land within a 5-mile radius around SJAFB. Written statements also aid in maintaining good relations between SJAFB and the city because it eliminates potential resentment from either party if something unexpected occurs, and they ensure that all information is properly disseminated.

Encouraging compatible land usage around an airport facility or military base is the first step toward reducing BASH hazards. If BASH hazards should arise, it is imperative that the local community and the airport facility work together to minimize these hazards. If off-base areas around SJAFB are identified as being wildlife attractants, the base encourages the implementation of a wildlife management plan by the property owners to reduce the abundance of birds currently utilizing these areas. Reducing bird abundance and bird hazards to flying safety through cooperative mitigation efforts between SJAFB and the City of Goldsboro will help ensure that BASH hazards do not become a factor to SJAFB during the consolidation of military bases throughout the country.

## ACKNOWLEDGEMENTS

Many thanks are extended to the 4<sup>th</sup> Fighter Wing Safety Office at Seymour Johnson Air Force Base. In particular, Ground Safety Manager Tim Edwards assisted the project with his knowledge of the USAF mission and the Bird/Wildlife Aircraft Strike Hazard (BASH) program. USDA Wildlife Services Wildlife Specialist Dennis Lewis spent numerous hours collecting bird observations and made tremendous contributions to flight safety at SJAFB and their BASH program. USDA Wildlife Services Wildlife Biologist Michael Begier also provided valuable insight and guidance into wildlife hazards at military bases.

## LITERATURE CITED

- CLEARY, E. C., AND R. A. DOLBEER. 1999. Wildlife Hazard Management at Airports. Federal Aviation Administration, Office of Airport Safety and Standards, Airport Safety and Compliance Branch, and United States Department of Agriculture, APHIS, Wildlife Services, National Wildlife Research Center, Ft. Collins, CO. December 1999. 248 pp.
- GATES, G. 2003. Wildlife can be beautiful – or just “plane” dangerous. Northwest Mountain Region, Federal Aviation Administration, Renton, WA. Newsletter “The Airports Approach” Vol. 18 (June issue), p. 3.
- GRAY, M. L. 2004. Wildlife Hazard Assessment for Seymour Johnson Air Force Base, North Carolina. United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services – North Carolina Program, Raleigh, NC. 62 pp.
- USAF (UNITED STATES AIR FORCE). 2004. Strike Stats. Aviation Safety Division, Air Force Safety Center. <http://afsafety.af.mil/AFSC/Bash/stats.html>
- USDOT (UNITED STATES DEPARTMENT OF TRANSPORTATION). 1997. Hazardous wildlife attractants on or near airports. Federal Aviation Administration, Advisory Circular 150/5200-33. May 1, 1997. 14 pp.