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Ted Sprague (Maj.)

*First Fighter Wing Safety, Langley AFB, Virginia*

Stephen Kendrot

*USDA-APHIS-Wildlife Services, Mosely, Virginia*

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### **Development of a Bird Aircraft Strike Hazard Program at Langley AFB, Virginia.**

Major Ted Sprague  
First Fighter Wing Safety  
Langley AFB, Virginia

Stephen Kendrot  
USDA-APHIS-Wildlife Services  
Mosely, Virginia

#### **Introduction**

Bird and other wildlife collisions with aircraft are frequently expensive and sometimes tragic. Each year, the US Air Force (USAF) reports an average of 2772 aircraft/bird strikes costing over 35 million dollars annually. Since 1985, 17 USAF planes have been destroyed and 32 airmen have lost their lives. Accordingly, the USAF invests heavily in preventing bird strikes and requires all Air Force bases to create a Bird Aircraft Strike Hazard (BASH) plan. The BASH plan is tailored to each base and identifies key wildlife hazards, tasks required to mitigate hazards and personnel to oversee and implement the plan. The installation's Flight Safety office is responsible for the plan, however, few safety officers have the wildlife expertise to collect the biological information necessary to identify and mitigate wildlife hazards. In addition, BASH plans sometimes suffer from a lack of continuity because of the high turnover rate of USAF personnel. In response to these challenges, some Air Force bases have contracted with USDA-Wildlife Services (WS) to provide assistance in managing wildlife hazards and developing site specific BASH plans. This paper outlines the administrative, logistic and management procedures followed to implement a comprehensive wildlife hazard abatement program developed by WS for Langley Air Force Base (LAFB) in southeastern Virginia.

#### **Study Area**

Langley AFB, a 2883-acre urban research and military complex jointly occupied by the First Fighter Wing, Air Combat Command headquarters and NASA Langley Research Center (LaRC), is located at 37 05.00 North and 76 22.30 West on the Virginia Peninsula. Communities in the local area include Hampton, Newport News, Poquoson, Norfolk, Yorktown and Williamsburg. Although the area is largely developed, Langley AFB is surrounded by natural communities and ecosystems such as the Northwest and Southwest Branches of the Back River, Plum Tree Island National Wildlife Refuge, and several miles of undeveloped shoreline along the Chesapeake Bay. Topography at Langley AFB is generally level with a maximum elevation of 11 feet above sea level. Bethel Landfill, a significant bird attractant, occupies a 400 acre site 3.5 miles west of Langley AFB.

#### **Wildlife Hazards**

The diversity of wildlife hazards at LAFB is reflected in the bird strike record. Though more than 75% of 181 bird strikes involved unidentified birds, 25 species have been struck and total damages exceed \$1.7 million. From 1993-98, WS provided technical assistance to LAFB on more than 10 occasions regarding the management of resident Canada geese, white-tailed deer, feral pigeons, and gulls. After two gull strikes caused nearly \$650,000 in damage in 1998, WS recommended that LAFB conduct a 12-month wildlife hazard assessment (WHA) to more accurately define the nature of wildlife hazards at the base and surrounding areas. In 1999, an interagency agreement was signed between LAFB and WS to conduct a WHA and implement an integrated wildlife damage management program to reduce hazards to aviation. The agreement provided for a full time wildlife biologist assigned to the First Fighter Wing Safety office.

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The WHA was initiated in June 1999 and consisted of weekly bird surveys deer surveys twice a month. Three independent bird surveys were conducted per sampling period along a standardized route that included seven observation stations. Birds were identified by species and assigned to a grid location based on their location on the airfield. Bird surveys were also conducted at nearby Bethel Landfill. Number of individuals, behavior and habitat use information was also recorded. Deer surveys were also conducted along a standard route. Deer populations on LAFB and NASA LaRC were surveyed separately.

### Results

Though the WHA yielded no surprises, the information it provided was instrumental in prioritizing wildlife damage management strategies. The wildlife hazards present at LAFB are diverse, as would be predicted by the ecological setting of the base.

- Resident Canada geese, abundant in the local area, were attracted to LAFB in significant numbers by Langley's 36-hole Eaglewood golf course. Seasonal use by over-wintering migratory Canada geese presented different challenges during the winter months.
- White-tailed deer have unrestricted access to the airfield as the layout of the runways and taxiways makes fencing a difficult and costly preventive measure. While LAFB itself is home to 20-35 deer, the 700-acre NASA LaRC harbors between 75 and 100 deer which have free access to LAFB. In addition, immigration through unfenced marshlands bordering the two facilities confounds deer population control efforts.
- Herring, laughing, ring-billed, and great black-backed gulls are seasonally abundant in the local area and are commonly observed loafing and feeding on the airfield. They also cross the airfield en route to Bethel landfill and other regional wildlife attractants.
- Osprey have staged a comeback in the lower Chesapeake Bay region and more than two dozen breeding pairs have established nests on and immediately surrounding LAFB. Nesting structures include buildings, water towers, marine navigational aids, utility poles, duck blinds and ball field lights. Ospreys are regularly observed hunting in the river, tidal ditches, and borrow pits on base; feeding on the airfield; and soaring on thermals over the airfield. In July 2000, an osprey was struck by an F-15, causing more than \$750,000 in damage.
- Langley is plagued by poor drainage problems. Ditches on the airfield are flooded daily during high tide and the lack of elevation contributes to temporary standing water during rain events. Threats of environmental contaminants deposited decades ago complicate ditch cleaning and maintenance efforts, further compounding the problem. Gulls, wading birds and waterfowl are regular, seasonal inhabitants, attracted by the crustaceans, fish and other prey items found in these ditches and low-lying areas.

### Wildlife Hazard Mitigation

Successful reduction of wildlife hazards on airports requires the integration of multiple management tools to minimize the attractiveness of habitat, modify the behavior of problem species, and reduce the populations of abundant problem species. The successful manager chooses tools that target the problem and that are applicable to conditions of the site. Developing a plan for reducing the wildlife hazards mentioned previously required close coordination between LAFB and WS, as well as other agencies, corporations, and organizations. In October of 2000, the interagency agreement between WS and LAFB was modified to include a full time wildlife specialist in addition to the biologist to provide BASH support during wing flying hours. Following are some components of the integrated wildlife damage management program implemented at LAFB.

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*Canada geese*- In June 1999, more than 225 resident Canada geese were molting at Eaglewood golf course adjacent to the airfield. WS recommended that the population be reduced to a manageable level via a roundup. The roundup was conducted by LAFB personnel and resulted in the removal of 189 geese that were then donated to local food charities. Intense media coverage of this event and criticism by animal rights activists fostered many novel recommendations from members of the public who felt that use of lethal methods to prevent bird strikes was excessive. In an effort to help LAFB officials make informed decisions regarding future goose management, WS arranged for several product and service demonstrations including goose repellents and border collies. After the base decided that neither method was feasible or cost effective, WS developed an integrated goose management program that included intense harassment with paintball guns and pyrotechnics, construction of barrier fences and overhead grids on golf course ponds, egg addling, and lethal removal to reinforce harassment. Additionally, in July 2000 WS coordinated an effort with the Virginia Department of Game and Inland Fisheries to neck band resident Canada geese on the Virginia Peninsula to provide information on their movements. This integrated approach was and continues to be highly successful in reducing the threat of resident Canada geese at LAFB. Migratory Canada geese over-wintering in the area continue to present problems during January and February when large flocks visit the golf course at night to feed. In addition to increased vigilance and continued harassment during this time, LAFB is considering the use of repellents to gauge their effectiveness in reducing feeding activity on the base.

*White-tailed deer*- LAFB holds an annual hunt on part of the base designed to provide hunting opportunities to military personnel and manage the local population. In addition, LAFB personnel conducted occasional removal operations on the airfield. Though this plan was effective in temporarily reducing deer numbers, immigration from NASA Langley Research Center quickly replenished deer that were removed. WS recommended a sharpshooting program to provide continuous removal of deer from the airfield. After several months of coordination with various base agencies including legal, operations, public affairs, and civil engineering, the plan was approved. The sharpshooting technique involves a driver, spotlight operator and shooter working from a pickup truck. The weapon used is a .308 caliber rifle fitted with a sound suppressor and a 10x scope. Deer can be humanely euthanized from distances exceeding 200 meters, and the sound suppressor often prevents remaining deer from being alarmed by the shot. This choice of weapon is far superior to a shotgun and is the key to the success of this program. Spotlight surveys are conducted twice monthly and efforts to detect and remove deer are increased the week prior to scheduled night-flying operations. All deer removed from the airfield are donated to Virginia's Hunters for the Hungry program.

*Gulls*- Gulls are ubiquitous in the area surrounding LAFB and many of the gull attractants are uncontrollable. Therefore, reducing the threat they pose to aviation requires vigilance and aggressive harassment. Lethal control is necessary to reinforce harassment, for gulls will quickly adapt to harassment methods that do not present an immediate threat to their safety.

*Osprey*- With nearly 2 dozen nesting pair raising 2-4 young in the local area each year, the abundance of osprey, combined with behavior that predisposes them to strikes with aircraft, makes them one of the greatest wildlife management challenges at LAFB. As the local population approaches saturation levels, competition for suitable nest sites is fierce. Tolerant of human disturbance, osprey are tenacious in their nest building activities. Traditional harassment techniques including pyrotechnics and electronic distress calls have proven ineffective. LAFB and WS have developed an experimental plan that aims to reduce the number of osprey in the local area. The first step is to establish an osprey free zone in which osprey are discouraged from nesting by removing nests and eggs, installing scare devices and, in particularly hazardous locations, removing adult birds. The second step is to relocate osprey chicks that hatch near LAFB before they learn to fly. Osprey usually return as adults to nest within 510 km of the site they fledge, regardless of where they hatched. Therefore, osprey chicks relocated to new nest sites several days before fledging, will return to the new sites as adults. Each year the Center for Conservation Biology (CCB) at the College of William and Mary captures fledgling osprey throughout the lower Chesapeake Bay as part of an effort to restore osprey to Ohio. At the request of LAFB and WS, CCB is capturing chicks hatched at LAFB as part of this recovery program, thus reducing the number of birds returning to LAFB in future years. The third component of this plan involves the construction of artificial nesting

platforms designed to attract ospreys displaced from LAFB to a National Wildlife Refuge east of the base and out of harms way.

### **Other services**

In addition to developing species specific management plans, WS has been able to assist LAFB in a number of other areas including: reviewing proposed projects on and off base to determine if they present a wildlife hazard to LAFB; providing assistance in applying for state and federal depredation permits as well as compiling reports to the Virginia Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service; assisting the LAFB Public Affairs office in answering media inquiries, producing press releases and educating base personnel regarding wildlife issues on base; and training LAFB personnel in BASH related skills such as bird dispersal and collection of bird strike remains.

### **Conclusion**

Through the combined efforts of WS and LAFB personnel, effective management plans were implemented to reduce the threats to aviation posed by Canada geese, white-tailed deer, osprey, gulls, and other wildlife in addition to identifying wildlife attractants requiring environmental manipulation. In the absence of wildlife biologists dedicated to BASH issues at LAFB, WS was able to fill a vacant niche and assist the base in developing and implementing an integrated wildlife damage management program that successfully reduced wildlife hazards.