

Bird vs plane – improving flight safety through biological science

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One could say that birds and planes share the same living space and hence interaction in the form of collisions is inevitable. The Wildlife and Aircraft Research Namibia (WARN) Project was established to investigate why birds are attracted to airports in order to implement measures to prevent wildlife-aircraft collisions.



WARN field work at Hosea Kutako (Peter Tarr)

On 23 March 2012 a British Airways Boeing 737 accelerated across the runway at Hosea Kutako International Airport and fractionally before V1 (the velocity at which the aircraft can no longer abort take-off) ingested a steppe buzzard (*Buteo vulpinus*) into its starboard engine, causing extensive damage. After aborting the take-off, the plane was grounded for weeks, with expensive repairs and flight charters costing the airline a great deal of money. A freak event it is not. With 231 known human deaths and 80 destroyed aircraft from collisions between aircraft and wildlife (mostly birds), aircraft wildlife collisions – or bird strikes as they are known in the aviation industry – are alarmingly common. At Namibia's two largest airports (Hosea Kutako and Eros), 128 such incidents were recorded between 2006 and 2010 alone.

There is no 'silver bullet' to prevent collisions from happening, but the industry is required by international law to minimise the risk. Hence aircraft and engine manufacturers spend a great deal of time and money to make planes less vulnerable to damage from collisions with wildlife, and airports have dedicated staff and equipment to deal with the problem.

In response to this risk in Namibia, the Wildlife and Aircraft Research Namibia (WARN) Project was born in 2009 through a partnership between the Namibia Airports Company (NAC), the University of the Free State (UFS), the Southern African Institute for Environmental Assessment (SAIEA), the Polytechnic

of Namibia and the National Museum of Namibia. It recognised that most measures applied globally to reduce the bird strike risk at airports are symptomatic. The industry shoots birds at airports, scares them with laser lights, pyrotechnics, dogs and falcons, and humans chase them on foot or in vehicles – with limited success. WARN has approached the problem from an ecological perspective, investigating through recognised scientific methods what attracts wildlife to airports, in order to develop measures to keep wildlife from coming to airports before the need to shoot or scare. Not only is this expected to be more effective, but also less disruptive to wildlife populations in the vicinity of airports (many of which are protected species).

The research, much of which formed part of my PhD project at UFS, has focused on comparing ecological factors at, and in the vicinity of, Hosea Kutako and Eros airports. From an ecological perspective we are interested in the influence that neighbouring land has on the problem. That is why we are comparing ecological parameters such as plants, arthropods and small mammals inside airports and in surrounding areas. Interestingly, the airports (especially Hosea Kutako) are acting like sanctuaries from predators for many organisms, and are stores of food for grazers and hence the avian predators that follow them. This all adds to the risk of collisions with aircraft. The airports mow the grass adjacent to runways in order to reduce the presence of birds, but extensive research has shown this to have a negligible effect on



Polytechnic students baiting small mammal traps at Hosea Kutako (Morgan Hauptfleisch)



Crowned lapwing (*Vanellus coronatus*) along the main runway at Eros airport



Author marking and releasing a bushveld gerbil (*Tatera leucogaster*) at Hosea Kutako. Small mammals such as this are important prey for raptors and other predators. (Peter Tarr)



Alton Tsowaseb, a student conducting a stomach content analysis of a bird strike culprit, a steppe buzzard (Morgan Hauptfleisch)

actual species richness and abundance. The only significant effect was on the diurnal striped mouse (*Rhabdomys pumilio*) which avoided the mowed areas. At Eros, mowing has provided an ideal habitat for crowned lapwing (*Vanellus coronatus*), as they hunt for harvester termites on runway verges.

Knowing what species of birds most commonly cause collisions (I use the word cause with caution, because I believe humans are probably the cause and not the poor birds) is obviously an important step in managing the problem. An analysis of bird strike reports between 2006 and 2010 for Eros and Hosea Kutako revealed crowned lapwing (*Vanellus coronatus*) to be responsible for most collisions, followed by helmeted guineafowl (*Numida meleagris*). It was also found that only about 20% of collisions between aircraft and birds are reported, making it difficult to identify and respond to trends in collision risk.

Some of WARN's research will hopefully be published in international scientific journals in the next few months (four articles), while two papers were presented at the International Bird Strike Committee annual gathering in Norway in June 2012. One of these papers describes the use of a model to predict the effect of a variety of ecological and anthropogenic factors on the risk of collisions – a world first. The model could be useful not only for aircraft-wildlife collisions globally, but also other forms of human-wildlife conflict. The model predicts the effect of bird control measures (shooting or scaring of birds) as well as preventative habitat-based measures on the risk of collisions over a 12 month period, while also keeping track of other factors such as climate and surrounding land use.

WARN is funded by NAC, and has recently established a bird-strike centre and research laboratory at Eros Airport, the first of its kind in Africa. We are kept on our toes by some interesting phenomena, for example a breeding colony of white-backed vulture (*Gyps africanus*) within a kilometre of the main runway at Hosea Kutako. While most of Africa is using technology and methodology developed in Europe and the USA, WARN realises that our unique conditions makes the application of foreign mitigation measures moderately successful at best. We need to find local solutions to the problem. To support this, WARN uses Polytechnic students (four to date) as interns to assist in research and training activities.

Some of our current research subjects include investigating the effect of different light colours and intensity in attracting insects to the airport runways and aprons, developing a microscopic feather analysis methodology for identifying bird species from feather remains, and tracking the vultures in the vicinity of Hosea Kutako using cell-phone transmitters or even radar.

For more details on the research or to receive the quarterly project newsletter contact:

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