Utilizing UAS to Support Wildlife Hazard Management Efforts by Airport Operators
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INTRODUCTION
- The Federal Aviation Administration (FAA) requires airports operating under CFR Part 139 to conduct a wildlife hazard assessment (WHA) when some wildlife-strike events have occurred at or near the airport.
- The safety efforts by airport operators have helped prevent aircraft accidents resulting from wildlife strikes.
- Information obtained from the scientific analyses of wildlife-strike data indicate that a multifaceted approach that includes research and innovative use of technology is vital.
- The purpose of this study is to investigate how UAS technologies could be effectively applied to identify hazardous wildlife species to aviation operations.
- Our team also works on ways to integrate UAS technologies into the airport environment.

FIELD CAMPAIGN
- Flights were conducted in an area roughly 90,000 square meters on the field.
- Our team utilized a trailer with different pieces of equipment, which included an Automatic Dependent Surveillance – Broadcast (ADS-B) flight box and two television (TV) sets that facilitated the safe and efficient completion of the drone operations.
- The controller was streamed to the TV via an HDMI cable so outside elements were not a factor.
- One team member was always present inside the trailer taking notes on the live feed from the UAS.
- The same team member also coordinated with the PIC and VO to ensure air traffic separation.

CONCEPT OF OPERATIONS
- Our team has been collecting data since April 2021.
- Our team collected data at Coe Field (8FA4), a private use airport.
- Researchers have used a DJI Matrice 210 with the Zenmuse X5 camera and a DJI Mavic 2 Enterprise Dual with thermal and visual cameras.
- The UAS was flown in two different ways: autonomously in a basic grid pattern, and manually.
- A QAWB also has assisted our team during this entire project.
- Once data was collected, our images were sent to the qualified airport wildlife biologist (QAWB) to help identify the species and reason for attraction.
- Our team has utilized a form similar to the Wildlife Survey – Airport Observation Sheet while recording the data collected with the UAS.

SOURCES

SAFETY RISK MANAGEMENT
- Our team applied different strategies to identify hazards and mitigate the risks associated with UAS operations in an airport environment.
- The use of an automatic detection surveillance broadcast (ADS-B) flight box with ForeFlight was used to monitor air traffic at and around Coe Field.
- UAS flights were conducted below 200 feet AGL.
- UAS flights were only conducted when VFR flight conditions were present.
- A visual observer helped keep eyes on the aircraft and to monitor the area for manned aircraft.
- If any perceived flight activity in the area at or below a 1,000 feet AGL and/or in the traffic pattern was seen, we terminated flight immediately.

KEY FINDINGS
- The use of UAS during a WHA can increase the effectiveness of data collection as well as reduce the cost to conduct.
- UAS can find the location of wildlife activities as well as features that have attracted or have the potential to attract hazardous wildlife species to the airport jurisdiction much quicker.
- UAS allows the QAWB to obtain valuable data and information that are vital during a WHA even in areas that are difficult to access by ground-based means.
- UAS reduce the labor, personnel, and time needed to accomplish most WHA tasks.
- Multiple Wildlife Species Congregating in a Wetland
- Different types of habitats and land use practices could attract hazardous wildlife to the airport environment.
- Orange circles – Cattle Egrets; Yellow arrows – Cattle, Red circle – White Ibis

Cattle Egrets on Freshly Unearthed Soil

Researchers Monitoring with the Trailer During Data Collection

Radio controlled aircraft (RCA), were very common to see at the data collection sight.

Our team worked with the pilot of the RCA to ensure proper separation and discussed safety tactics if there was an emergency.

Mammals, such as cows and White tailed deer pose a significant threat to aircraft operations.

We were able to monitor wildlife without disturbing their activities.

With the cows above, we monitored the Cattle egrets that congregated near the cows.

Wetlands are not uncommon at or around airports.

The above area always had a variety of wildlife which attracted or have the potential to attract hazardous wildlife species.

The use of UAS can find the location of wildlife activities as well as features that have attracted or have the potential to attract hazardous wildlife species to the airport jurisdiction much quicker.

Habitats and land-use practices at and around the airport are key factors affecting wildlife species and the size of their populations in the airport environment.

Without the use of UAS, it is difficult for a QAWB to observe and monitor the presence and behaviors of wildlife in certain habitats (e.g., wetland).

Wildlands are not uncommon at or around airports.

The above area always had a variety of wildlife species that congregated near it.