Utilizing UAS to Support Wildlife Hazard Management Efforts by Airport Operators

Authors: Kayla Boccuzzo, Jose Cabrera, Anthony Chimino - Undergraduate Students and Researchers
Faculty Advisor: Flavio A. C. Mendonca, Ph.D. – MBA

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 technologies 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

Researcher Monitoring the Two TV Sets inside the Trailer During Data Collection

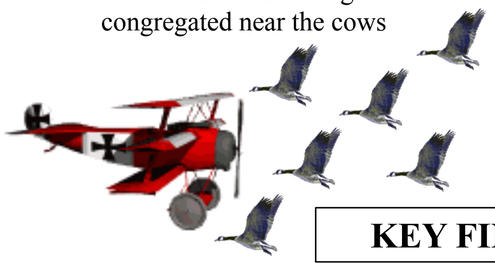
- The presence of wildlife and possible wildlife attractants was recorded
- The presence of manned aircraft at and around Coe Field airport was monitored for risk management purposes

Cattle Egrets on Freshly Unearthed Soil

- 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

Cattle Identified with UAS

- 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



Wetland at the Airport Environment

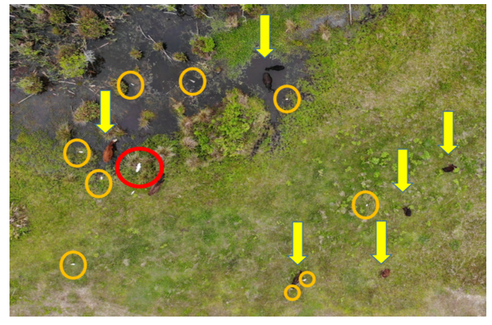
- Habitats and land-use practices at and around the airport are key factors affecting wildlife species and the size of their populations in the airport environment
- Without the use of UAS, it is difficult for a QAWB to observe and monitor the presence and behaviors of wildlife in certain habitats (e.g., wetland)
- Wetlands are not uncommon at or around airports
- The above area always had a variety of wildlife species that congregated near it

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

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



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

SOURCES

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