Bird Strike Hazards and Mitigation Strategies for Military Rotary Wing Aircraft

Project # 11-944

Background:

Wildlife collisions with military aircraft pose significant risks and result in economic losses. Although several examinations of wildlife strikes with fixed wing aircraft have been conducted, there is currently no available analysis of wildlife strike hazards to military rotary wing aircraft.

Objective:

Rotary wing aircraft operations comprise important mission components for all the Military Services. Thus, a comprehensive analysis of wildlife strikes to rotary wing aircraft among all Military Services is clearly needed to provide an understanding of the nature and extent of this issue.

Summary of Approach:

We acquired all available wildlife strike records and associated information involving rotary wing aircraft from the U.S. Army (ARMY), U.S. Air Force (USAF), U.S. Navy and U.S. Marine Corps (NAVY), and the U.S. Coast Guard (USCG). We created a composite wildlife strike database and conducted a line-by-line review of each wildlife strike record in the database to ensure data integrity and consistency. We parsed our database to include only wildlife strikes to military rotary wing aircraft that were reported to have occurred within the contiguous United States, Alaska, and Hawaii. In addition, we examined wildlife strikes to ARMY and USAF military rotary wing aircraft engaged in flight operations during overseas deployments associated with U.S. military bases worldwide.

Benefit:

Our analyses of wildlife strikes have shown that there are important patterns within wildlife strike data for flight operations conducted both on airfields and during off-airfield missions. We provided recommendations to aircrews, mission planners, aircraft engineers, and airfield managers.

Accomplishments:

Overall, reported wildlife strikes with ARMY and USCG rotary wing aircraft remained constant across years. The ARMY and USCG do not have formal bird/wildlife aircraft strike hazard (BASH) programs and thus we suspect that many wildlife strikes, particularly ones not causing damage, are often unreported. An increasing pattern of reported wildlife strikes to USAF and NAVY rotary wing aircraft over time was likely due to increased awareness and increases in 'in theater' overseas flight operations for USAF rotary wing aircraft squadrons during the latter half of the 2000s. Month (season), time of day, location (on- or off-airfield), and other factors influenced the frequency of reported wildlife strikes with rotary wing aircraft. The frequency of wildlife strikes was highest during fall and lowest during winter.

Although wildlife strikes to military rotary wing aircraft occurred during all phases of aircraft flight, strikes occurred most frequently when aircraft were traveling enroute or engaged in terrain flight. The windscreen was the most frequent impact location for reported wildlife strikes for all Military Services. Wildlife strikes with military rotary wing aircraft operating overseas were reported in more than 31 foreign countries. Almost two-thirds of overseas reported wildlife strikes to ARMY rotary wing aircraft occurred during deployments in the Middle East, whereas overseas wildlife strikes to USAF rotary wing aircraft occurred most frequently in Afghanistan and the Middle East. Larks, perching birds, doves and pigeons were struck most often.

Wildlife strikes to military rotary wing aircraft are both costly and deadly. The average cost of a damaging wildlife strike to a military rotary wing aircraft varied among the Military Services, ranging from $12,184 per incident for USCG aircraft to $337,281 per incident for NAVY aircraft. Wildlife strikes to military rotary wing aircraft resulted in a total of 8 human injuries (typically cuts, lacerations, and/or bruises to pilots and copilots). Two lives were lost when a Red-tailed Hawk collided with a USMC AH-1W helicopter, causing it to crash in California in 2011.

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