

Embry-Riddle Aeronautical University

From the Selected Works of Paul F. Eschenfelder

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Advice to Flight Crews Concerning Wildlife Hazards to Aircraft

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ADVICE TO FLIGHT CREWS
CONCERNING THE WILDLIFE HAZARD TO AIRCRAFT

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Prior to Takeoff

- **If you see wildlife such as birds or deer on or near the runway, do not land or take off on that runway until the wildlife are safely dispersed** (a delay may be required which is similar in length to that experienced if thunderstorm activity were present in your flight path). In the U.S., the airport manager is responsible under FAR Part 139 to mitigate wildlife hazards on the airport. Many other nations have similar regulations or requirements of airport management to mitigate wildlife hazards. The airport manager should have a plan of action and operations people who are trained on techniques for wildlife dispersal and available to do so.
- Do not expect that birds will be responsive to actions you may take to hasten their departure. When loafing on the ground, birds face into the wind and, therefore, will probably not see your aircraft as it enters the runway or its lights. Airborne weather radar has no demonstrated effect on birds because they do not hear in the x-band frequency. While birds have acute hearing, there is no evidence that they associate noise, such as the spooling up of a Jet engine, with -any threat - do not expect, therefore, that the spooling up of engines will cause birds to take flight.
- U.S. pilots are responsible under FAR Part 91 to "...see what can be seen and separate his aircraft from obstructions and hazards, including birds." ¹ Therefore, prior to departure, look for wildlife while scanning the runway for other hazards and respond to sightings or verbal warnings of wildlife as you would to other aviation hazards.
- Promptly notify Air Traffic Control personnel when observing wildlife hazards on the airport or in flight. Although paragraph 2-1-22 of FAA Order 711 0.65, the Controller's Handbook, requires controllers to issue advisory information on reported bird activity, including type of birds, location and direction of flight, use the word "Pirep" in your report to ensure that controllers are aware that they should alert other aircraft of the hazard.
- When taking off in a string of departures, such as is common at a hub, be particularly cautious when wildlife are in the vicinity. The lead or second aircraft may frighten feeding or loafing birds into becoming airborne over the runway or departure area, becoming a collision risk for following aircraft. This scenario was one of the causal factors in the crash of an E-3 (B-707) in Alaska in 1995. Birds may attempt to return to the spot on the airport from which they were frightened by going into a "holding pattern" over the airport to wait. Therefore, if the lead aircraft scares flocks of birds into becoming airborne, wait until the flock has cleared the area prior to attempting takeoff

Inflight

- Over 90% of bird strikes happen below an altitude of 2,300 feet. If taking off in an area of high bird activity, climb as expeditiously as possible. If en route and suddenly confronted with birds, pull up rapidly, consistent with good piloting technique. Birds, when confronted with a collision risk, tend to tuck their wings and dive away from the intruder. However, expect that birds will turn in random directions to avoid a collision when they are close to the ground but they will not descend.

- Consider slowing down if confronted with bird activity. If a collision occurs, a slower speed may minimize the damage as the damaging force is determined by mass times velocity squared. Slower speeds will give the birds more time to react and avoid a collision.
- If wildlife are reported on or near the active runway, request another runway. Avoid flying over locations of known wildlife attractants. Birds like bodies of water, such as airport retention ponds, lakes and seashores. Consider requesting a different route if your assigned route carries you over or near wildlife activity.

Aircraft Certification

- Although designed to be very strong in many ways, modern aircraft are not capable of protecting the pilot from all wildlife hazards. All modern aircraft fuselages have been penetrated by birds - the B-737 and B-727 appear most susceptible to bird penetrations, especially around the nose area. In 1997, three crew members were injured in three separate events when birds struck their cockpit windows. Although the windows were not penetrated, per se, the pilots were injured when the inner pane shattered and showered the pilots with glass shards.
- No jet engine currently operating is certified to ingest even one large goose and continue operating. Geese and swans are social animals and move in flocks. The seriousness of an encounter with large wildlife such as geese, swans, eagles, vultures, etc., cannot be overstated. However, smaller flocking wildlife, such as starlings, which have high body density and often flock by the hundreds or thousands, may have the same effect upon aircraft engines. Engines are certified as a type, not as a system with a particular aircraft. If sufficient number of wildlife are encountered, they can and have damaged engines to the point that they must be shut down, or continue operating but with less thrust available than is necessary to remain airborne.

Bird Migration

- In North America, a migration of over ³300 million birds takes place in the spring and fall each year. The four main flyways, namely the Atlantic, Pacific, Mississippi and Central, follow both coastlines, the Mississippi River and the central plains east of the Rockies. Weather is the key to the start of migration - Nexrad radar can display thousands of flocks of birds headed south in the fall and paralleling strong cold fronts as they move across the country. Migrating birds will often wait on the ground for days for favorable winds aloft. During migration, waterfowl will fly both day and night, depending on weather and winds, and typically as high as 10,000 feet. This semi-annual migration creates additional hazards to aviation as migrating birds join resident airport birds and increase the likelihood of conflict with aircraft.
- Although spring and fall migrations create two peaks of unusual hazards, the other period of increased hazard is late summer as the inexperienced fledglings begin flying and the adult birds molt, shedding their flight feathers, thereby reducing their maneuverability.

Report Wildlife Hazards

- If you encounter wildlife hazards or experience a strike with birds or other wildlife in the U.S., submit the appropriate company safety report and an FAA Form 5200-7 Bird Strike Report, in addition to a NASA ASRS report. Canadian pilots' wildlife strike reports should be made on the Transport Canada Bird/Wildlife Strike Report Form, #51/0272 (6-97). The toll free number is (888) 282-BIRD and the Web Address is: <http://www.tc.gc.ca/aviation/wildlife.htm>. Reporting can be done on the web site.
- These reports should be submitted even if no damage is done to your aircraft because they are the basis for documenting problems and for requesting action from appropriate authorities to mitigate wildlife hazards. Without the reports it is difficult or impossible to substantiate the need for improvements.

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