
AVOIDING BIRD STRIKES

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Bird hazards to aircraft can create serious inflight emergency conditions if the pilot and crew are not prepared to handle the situation. As a pilot who experienced two serious bird strikes which required emergency landings, and as a biologist who has spent the last 9 years working on bird hazards to aircraft, some personal observations may assist other pilots in dealing with a mid-air bird strike.

Any bird, regardless of size, should be considered as a potential hazard, especially when you are flying enroute. The speed of the aircraft dictates the force of impact--the faster you are flying, the greater the impact forces. As speed doubles, the kinetic energy which must be dissipated on impact increases by a factor of four. Consequently, if you must descend into an area of high bird concentrations, consider your approach speeds.

At what altitude are you safe from birds? Strikes have been reported as high as 33,000 feet, and ducks and geese have been observed at and above 20,000 feet MSL. These altitudes are the exception rather than the rule. Over 90 percent of all civil bird strikes in the United States occur below 3,000 feet. At what altitude do you usually flight plan for and fly during the fall and spring bird migrations?

There are essentially two major risks associated with birds: windshield penetrations and engine ingestions. Windshield penetrations usually occur on climbout or while flying at higher speeds during cruise. Commuter or air taxi operators frequently fly at lower altitudes where birds share the airspace. A typical cockpit penetration can result in facial lacerations, cuts on the hands and face, and structural damage to the aircraft.

Because electrical panels and circuit breakers are located behind the pilot or copilot, electrical failures and electrical fires may also occur. In air taxi operations, injury to passengers is possible. Wind blast through the hole in the windshield can make cockpit communications impossible and radio communications unintelligible. The loss of communication ability can seriously compound any emergency procedure.

The spinning propeller in front of the windshield is no protection. In high speed situations, pilots should consider initiating a climb to reduce speed and wind blast, and consider flying above flocks of birds. With the windshield missing, changes in airflow may affect the pilot's ability to control the aircraft at slower speeds. Don't stall the aircraft in the traffic pattern because you failed to perform a controllability check.

In an engine ingestion situation, damage can vary. On turbine or turboprop engines, the most common outcome is no damage or slight damage to the engine fan or compressor blades. However, in more serious situations, blade damage can be sufficient enough to cause increasing engine vibrations, high exhaust temperatures, compressor stalls, engine fires or catastrophic failures. There was one such event where a rear fuselage-mounted engine on an executive jet was ripped from its mounting following a collision with a pelican.

Birds involved in engine ingestions are frequently flocking birds, increasing the possibility of damage to more than one engine. Another interesting occurrence is that some engines may have the airflow choked off by bird remains and quit running, but no damage occurs.

The most critical engine ingestion scenario is a single or multiple engine ingestion causing a power loss on takeoff. During this critical phase of flight, it is essential that the pilot properly recognize the emergency situation and perform proper engine-out or crash landing emergency procedures.

Pilots are encouraged to consider the following bird hazard checklist:

1. Review information in the NOTAMS and the Airport/Facility Directory about your departure and destination airport.
2. Flight plan at an altitude above 3,000 feet; the higher the better.
3. Avoid overflight of national wild-life refuges.
4. Flight plan to avoid flying along rivers or shorelines in the fall and spring. Birds frequently follow these natural terrain features during migration.
5. Thoroughly brief emergency procedures before departure, including those procedures to be followed if cockpit communications are lost.
6. During taxiing, watch for birds on the airport. If birds are observed, request that airport management disperse the birds before takeoff.
7. Do not take off if flocks of birds are on or adjacent to the runway.
8. If an engine ingestion occurs on takeoff, abort if speed and remaining runway will allow. Inspect the engine before attempting a second takeoff. Several air carrier incidents have occurred where engine failures or high vibrations developed during the flight because of undetected engine damage.
9. If the takeoff must be continued, properly identify the affected engine and execute emergency procedures.
10. If structural damage occurs or a windshield is penetrated, consider the need for a controllability check before attempting a landing.
11. If a windshield failure occurs, climb to slow the aircraft and reduce wind blast as necessary.
12. Use sunglasses or smoke goggles to reduce the effect of wind blast, precipitation, or debris.
13. If the windshield is cracked or delaminates, slow the aircraft and wear glasses or goggles to protect the eyes in case of a subsequent failure.
14. During cruise, watch for flocks of migratory birds and attempt to climb above observed flocks.
15. Use landing lights during descent. While there is no concrete evidence that birds see and avoid aircraft, the lights do aid the pilot.
16. If flocks of birds are encountered on descent or on an instrument approach, execute a missed approach, climb, and circle for a second approach. Since most flocks are distributed downward in the airspace, climbing will avoid the greatest number of birds. Birds will also migrate in waves across a wide front; therefore, a delay in the approach may result in clear airspace.
17. If high bird concentrations are encountered, slow the aircraft to minimize impact forces.
18. Upon landing, check the aircraft for bird strike damage.
19. Report all bird strikes on FAA Form 5200-7 (Bird Strike/Incident Report) which is available through the local General Aviation District Office, Flight Service Station, or Airport District Office.
20. Recognize that a bird is a ballistic object much like a bullet. Many pilots never experience a bird strike, and only one-third of all strikes cause damage; however, awareness of the problem can aid in the proper handling of an emergency situation.

These 20 tips are designed to prepare the pilot and crew for a bird strike. Improved pilot awareness of the potential hazard will result in a reduction in the number of serious bird strike incidents.

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