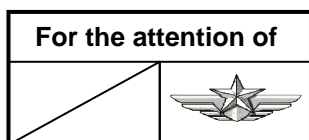


SAFETY PROMOTION NOTICE

SUBJECT: WINDOWS

Bird Strike Risk Mitigation in Rotorcraft Operations, published by ESPN-R
ATA: 53



AIRCRAFT CONCERNED	Version(s)	
	Civil	Military
EC120	B	
AS350	B, BA, BB, B1, B2, B3, D	L1
AS550		A2, C2, C3, U2
AS355	E, F, F1, F2, N, NP	
AS555		AF, AN, SN, UF, UN, AP
EC130	B4, T2	
SA365 / AS365	C1, C2, C3, N, N1, N2, N3	F, Fs, Fi, K, K2
AS565		MA, MB, SA, SB, UB, MBe
SA366		GA
EC155	B, B1	
SA330	J	Ba, L, Jm, S1, Sm
SA341	G	B, C, D, E, F, H
SA342	J	L, L1, M, M1, Ma
ALOUETTE II	313B, 3130, 318B, 318C, 3180	
ALOUETTE III	316B, 316C, 3160, 319B	
LAMA	315B	
EC225	LP	
EC725		AP
AS332	C, C1, L, L1, L2	B, B1, F1, M, M1
AS532		A2, U2, AC, AL, SC, UE, UL
EC175	B	
H160	B	
EC339		KUH/Surion
BO105	C (C23, CB, CB-4, CB-5), D (DB, DBS, DB-4, DBS-4, DBS-5), S (CS, CBS, CBS-4, CBS-5), LS A-3	CBS-5 KLH, E-4
MBB-BK117	A-1, A-3, A-4, B-1, B-2, C-1, C-2, C-2e, D-2, D-2m, D-3, D-3m	D-2m, D-3m
EC135	T1, T2, T2+, T3, P1, P2, P2+, P3, EC635 T1, EC635 T2+, EC635 T3, EC635 P2+, EC635 P3, T3H, P3H, EC635 T3H, EC635 P3H	

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Airbus Helicopters would like to raise awareness about:

- The Safety Information Bulletin published by EASA ([link](#))
- The article on Bird Strike Risk Mitigation in Rotorcraft Operations, published by ESPN-R. It is the document attached hereto, which contains active links to play videos. <https://www.youtube.com/watch?v=XMt462ZzOTY>

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Keywords: Bird strike, safety, aircraft helicopter, low altitude, birds, collision, wildlife, airport, airfield, habitat, migration, operation, mission, coastal line

Bird Strike Avoidance Managing the Risk of Bird Strike

While bird strikes are not a new risk to helicopters, the reduction in flying activity in some areas of aviation have considerably increased the number of birds in certain locations where helicopters regularly operate. This article is based on and expands the EASA SIB [EASA SIB Rotorcraft Operational Safety Procedures to Mitigate Bird Strike Risk](#) of April 2021 and brings together a number of different resources from other sources to help helicopter operators, and others like heliport operators, understand and manage the risks involved. It is primarily intended for operators, Safety Managers, pilots including General Aviation pilots, instructors, engineers and inspectors and could be of interest for other personnel.

Bird strikes: an increased risk or just more visible?

Both EASA and the FAA have observed an increased reporting of bird strike occurrences on helicopters, thereby elevating the risk of potential serious injuries or fatalities to occupants and substantial damage to rotorcraft.

Unlike military helicopter designs, civil helicopters have very little ballistic protection and only 10% of the European Civilian helicopter fleet have been certified against the bird strike requirement in CS29.631. Most of the EU Civilian helicopters fleet is not designed to resist a bird strike.

SIB Rotorcraft Operational Safety Procedures to Mitigate Bird Strike Risk of April 19, 2021 based the FAA Report Rotorcraft Bird Strike WG Recommendations to ARAC of July 2, 2019

Based on this observation, in 2016, EASA participated in the Rotorcraft Bird Strike Working Group tasked by the FAA to provide recommendations to the Aviation Rulemaking Advisory Committee (ARAC). This work resulted in the [SIB Rotorcraft Operational Safety Procedures to Mitigate Bird Strike Risk](#) published on Apr 19, 2021 based on the [FAA Report Rotorcraft Bird Strike WG Recommendations to ARAC, published on July 2, 2019](#).

What does this article give you?

This article complements the information and recommendations provided in this EASA SIB and brings in other material notably by AOPA, EGAST, TCCA, Airbus Helicopters and NGPT. See the References section.

Mitigation efforts on and by airports have proven to have shown significantly successful reduction of bird strike events and / or their consequences. You can access our free Wildlife Hazard Management Guide for Aerodromes [on the Air Ops Community](#).

Bird Strike Definition

To get the formal part out of the way, a bird strike or bird ingestion for an engine, bird hit, or BASH (Bird Aircraft Strike Hazard) occurrence involves a collision between an aircraft and airborne birds or by extension, other species like bats or ground animals.

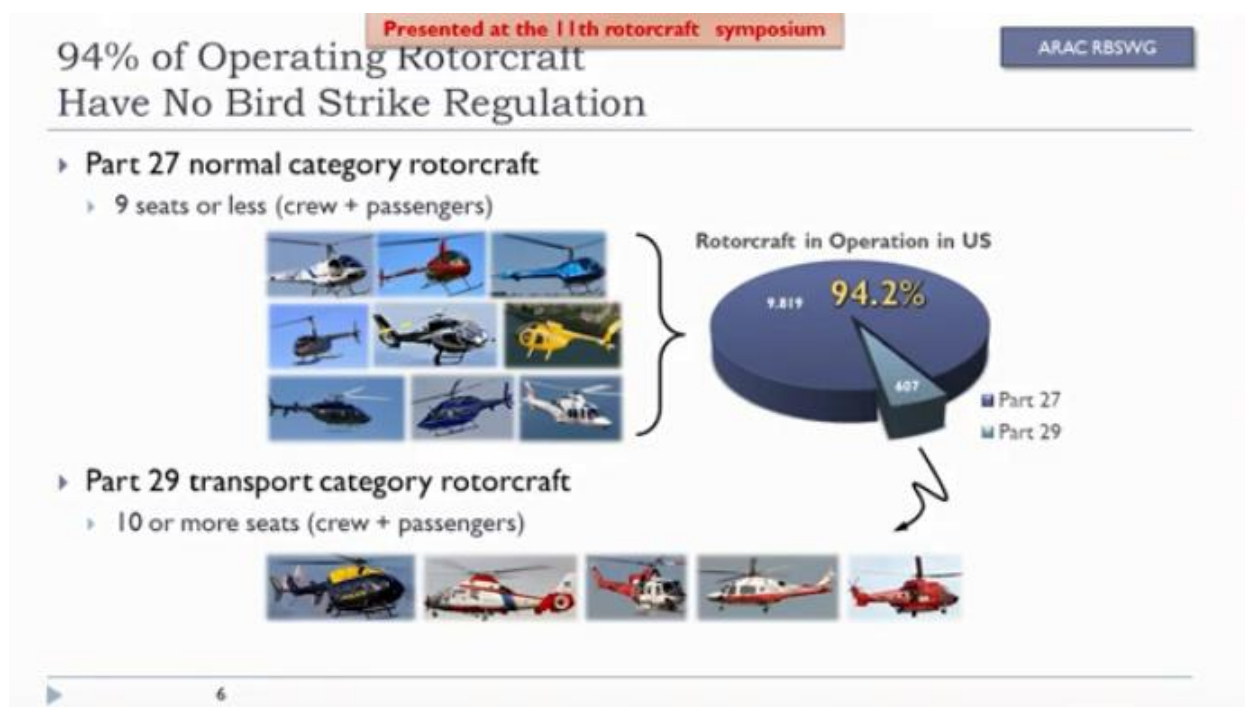
[Bird Strike in a Helicopter - Pilots View](#)



Some facts and figures to help understand the hazard

- Most bird strikes occur near or on airports (90%, according to the ICAO) during take-off, landing and associated phases.
- Birds seek places where they can feed or find nutrition (e.g. bird and wildlife sanctuaries, garbage dumps).
- Bird strikes happen most often during take-off or landing, or during low altitude flight. Most bird strikes occur between 1000 and 2000 feet AGL. According to the FAA Wildlife Hazard Management Manual (ref. 2005), less than 8% of strikes occur above 3 000 feet and 61% occur at less than 100 feet. Flying above 5000 feet when practicable reduces the probability of bird strike. However, bird strikes have also been reported at high altitudes, some as high as 20 000 to 30 000 feet AGL.
- Bird strikes above 500 feet AGL are about 7 times more frequent at night than during the day during the spring and fall migration seasons.
- Most strikes and resulting damages occur on the front fuselage section, mainly on the windshield, than on the main rotor.
- Small rotorcraft are more likely to suffer from damage compared to large rotorcraft. The lack of requirement for CS-27 rotorcraft category is reflected in a higher rate of damage. Risk of occupant/crew injury on non-certified rotorcraft is a concern due to windshield vulnerability.

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What this means for helicopter operations:

Even in a part 29 certified helicopter, the design-related provisions might not fully protect you and the aircraft and prevent damage or penetration from a situation more demanding than what is covered by the regulation.

- The largest numbers of strikes happen during the spring and fall migrations. More than 2 billion birds migrate from their European breeding grounds to their residence areas in sub-Saharan Africa. The bird's behaviour and migratory pattern is shaped by the seasonal food availability en route and in the African residence areas, as well as by the short-term weather conditions. They migrate along three major routes: West via Gibraltar, South via Italy and East via Greece, Israel and Egypt.
- Migrating birds use varying altitudes between 300 feet and 9000 feet AGL depending on the wind direction. Birds use tailwind to their best advantage.
- Helicopters scare birds more than other types of aircraft. The reaction decreases significantly if the helicopter has a vertical and lateral distance of more than 1000 feet to the birds or their breeding grounds.
- Birds in open areas have stronger reactions to aircraft than inhabitants of dense vegetation.

Recommendations

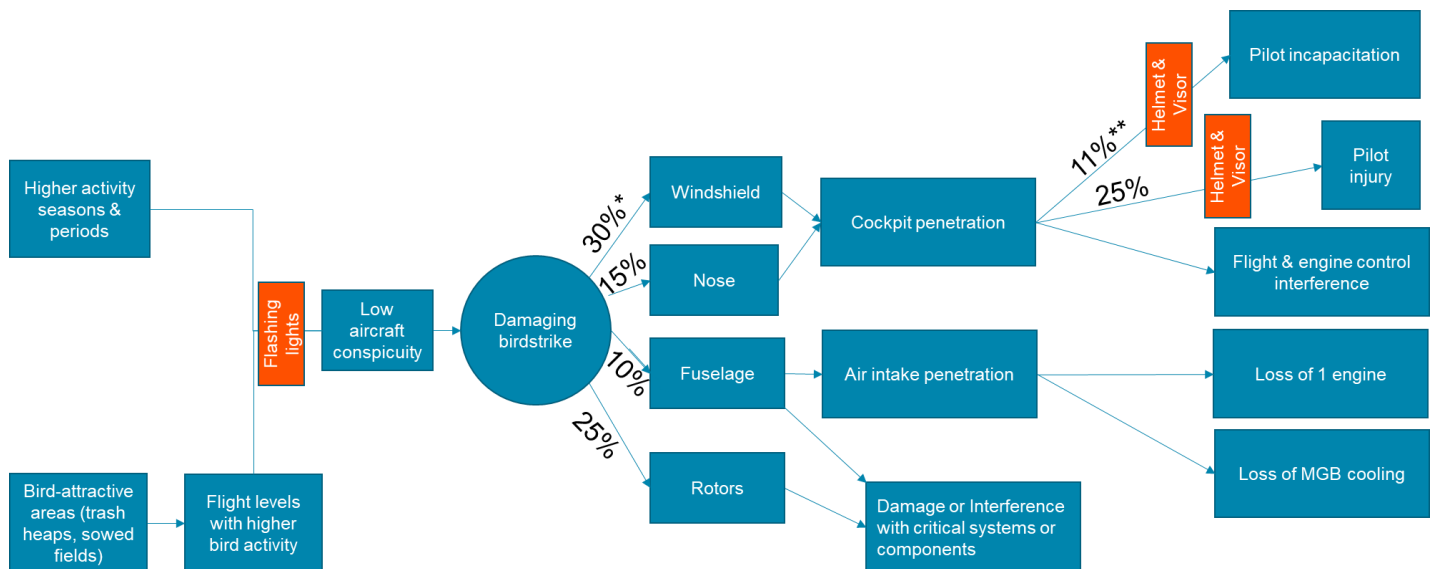
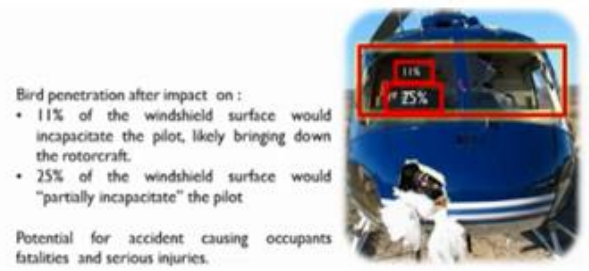
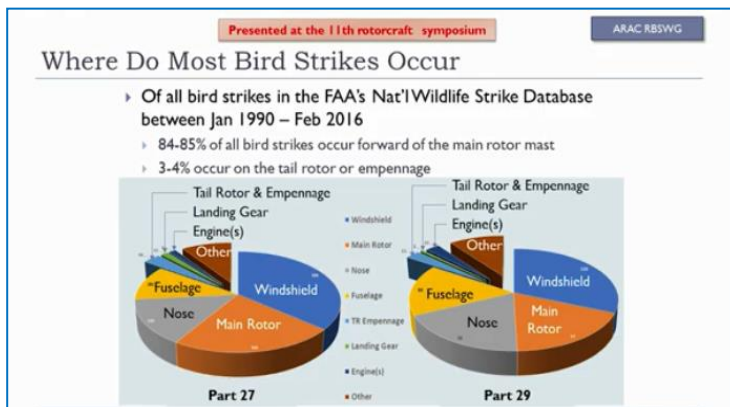
Recommendations presented in this article are primarily intended for operators, Safety Managers, pilots including General Aviation pilots, instructors, engineers and inspectors and could be of interest for other personnel.

Recommendations are organised in three categories:

1. Safety Management System & Awareness
2. Pre-Flight Planning
3. Risk Mitigation at the aerodrome and in flight

1. Safety Management System

Focusing on identifying and assessing the bird strike risk with the given facts:



The reason why this method, even if simplified is used here is because it is a very easy method to help identifying and mitigating the risk involved in using an off-airfield site.

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The following should be made available to the rotorcraft operators and Safety Managers to feed the SMS Risk Assessment and Management processes and to the pilots for pre-flight planning:

- Consult National and International Bird Societies, local ornithological clubs, National Aviation Authority (NAA) and bird control experts to identify and publish known locations and probability of bird concentrations and behaviour.
- During spring and fall migrations, identify the location of bird concentrations and the local bird nesting and roosting habitats.
- Operators should encourage reporting on bird and wildlife hazards. Where possible the risks should be identified and shared internally, specifically with known locations and probability of bird concentrations.
- Be aware of how changing circumstances can impact the risk to your operations so you can take the appropriate action. For example, natural situations like temporary flooding, changes in land use and particularly around the introduction/removal of wetland habitats can fundamentally change the species attracted and the associated bird strike risk.
- Authorities and operators should incorporate this information into alert bulletins, flight service Notice to Airmen (NOTAM) and other systems informing flight crews of bird concentrations.+
- Establish appropriate SOPs if your operation is in the vicinity of sensitive (wildlife) areas. (See an example with reference to it on the last page)

2. *Pre-Flight Planning*

Focusing on risk avoidance at the pre-flight planning stage

- Use all information resources available about migratory routes and bird concentrations and address the bird strike risk in flight preparation.
- Check NOTAM (BIRDTAM) and ATIS regarding bird activity at departure and destination.
- If there are two pilots, discuss emergency procedures before departure.
- **Bird strikes can result in pilot incapacitation: pilots should use helmets with visors down and other personal protective equipment such as eye protection.** Other personnel should also consider using personal protective equipment when practicable.

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[Bird Strike Goose Crashes Through Airplane Windshield](#)



- **In single pilot operations, bird strike can incapacitate the pilot and result in a loss of control accident. Use helmets and eye protection!**
- Plan to fly at a minimum of 2500 feet when possible, as data shows that operating rotorcraft above this height significantly reduces the likelihood of a bird strike: for every 1000 feet of altitude a pilot climbs, there is a significant reduction in bird activity. Fly at the highest altitudes possible when environmental conditions allow. Bird strikes may however occur at high altitudes as high as 20 000 to 30 000 feet AGL.
- Avoid flying at low altitudes when possible, especially along rivers or shorelines (birds, as well as pilots, use these as navigational features) and over offshore islands, headlands, cliffs, inland waters and shallow estuaries.
- Certain operations, like hoist and sling load operations, other SPOs and HEMS (not an exhaustive list) however require flying low: watch out for birds! **Reduce speed especially in critical day-times.**
- Respect if possible, bird habitats. Avoid flying in or into known areas of bird concentration, like wildlife sanctuaries, coastlines and landfill sites (especially in spring and autumn) and fish packing facilities.
- Transits over areas of wetlands and inland water areas, such as lakes and ponds, should be avoided and if this is not possible, the 2500 feet AGL minimum should be aimed for.
- Coastlines should be crossed at 90 degrees to give minimum exposure to bird activity which is usually greatest on cliffs or at the waterline. Fly above 2500 feet AGL when practicable. Expect to find birds in cliff or ridge soaring.
- **The greater the airspeed and heavier the bird, the greater is the risk of a bird strike and resultant damage.** The slower the bird wing beat frequency, the larger is the bird.

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[Bird Strikes on Aircraft, Bird Avoidance in Aviation, CAA Safety Sense Leaflet \(reproduced by REDSPAN in video format with the permission of the UK CAA\)](#)



- In cities near or over bridges and riverbanks, beware of pigeons and seagulls, and of starlings, swallows and parakeets (invasive exotic species), which commonly fly in flocks. These species can also be encountered in the countryside.

[Flock of Starlings Fly in Captivating Murmuration Above County Tipperary Lake, Ireland](#)



- **Bird flocks represent the highest risk of bird strike, both regarding probability of encounter and severity of damage.**
- Birds of prey have been reported to attack gliders and other aircraft!

[French Alps from an Eagle's Eyes](#)



- Beware of birds when flying in mountainous areas and near or over cables, tall trees, rocky peaks, poles, antennas and other artificial or natural obstacles used as perches.
- Birds species are either active during the day or at night and during dawn and dusk: consider this when planning a night flight.
- Many of the larger birds like Canada Geese like open spaces such as airfields to feed on at dawn and dusk. Plan routine activities like maintenance test flight, training and positioning flights outside of these time periods where possible.
- Many birds have plumage that can be difficult to discern from the background.
- Bird Strike risk is higher in spring and in autumn. In the springtime, conduct a thorough pre-flight inspection, as bird nests can be built in only a few hours. Look for nests including in hidden places.

Insert the following CAUTION in the Rotorcraft Flight Manuals (RFM) : please refer to the EASA SIB Rotorcraft Operational Safety Procedures to Mitigate Bird Strike Risk of Jan/Feb/March 2021 (TBD):

3. *In-flight procedures*

Focusing on coping with the Bird Strike in the departure area and in-flight

Define and implement Bird Strike safety procedures to reduce the risk of bird strike when operating in areas of known bird concentrations:

- Before taking off, listen for any warnings of bird activity on the ATIS.

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- Watch for birds on the airport, around the helipad or landing area. If a large gathering of birds is reported or observed on or near the runway, helipad or departure area, the take-off should be aborted or delayed and when not possible (e.g. HEMS missions) done in a very attentive and careful manner.

Report all unusual bird activity to the Air Traffic Control (ATC) or Flight Information Service (FIS) and request that airport personnel disperse them before you take off. Helicopters scare birds more than other types of aircraft. However, never use an aircraft to scare birds away.

Note: If you try to hover in the vicinity of a bigger bird population for the purpose of a careful approach, be aware that birds might be grounded on the location as the helicopter thwarts their ability to generate lift.

- After take-off, increase altitude as quickly as possible and fly above 2500 feet AGL as planned, when practicable. Fly higher at night when possible, since birds also tend to fly higher at night.
 - Departure from cruising altitude for landing should be completed as late as possible to avoid flying low level for any extended time.
 - While flying at lower altitudes, consider when practical reducing airspeed to allow greater reaction time for the pilots and birds. More than 3 out of 4 bird strikes (77%) occur when airspeeds are greater than 80 knots because from 80-90 knots over, birds and pilots have no time to get out of the way. Be aware of this, especially when you are in a sensitive area or in a riskier time of the year or during dusk or dawn - specifically during en-route flying where your speed usually is greater than 80-90 knots.
 - The higher the speed, the greater the chance of a strike and the greater the energy of the impact!
 - At night, increase awareness and keep in mind that a potential combination of unfavourable circumstances mentioned before will tremendously increase the likelihood of a bird encounter!
 - Use pulse lights, taxi lights and/or landing lights when operating in the vicinity of bird activity. Taxi lights and/or landing lights should be used in a continuous mode during sunny conditions and at night when practicable. Use 2-Hz pulsed mode LED near-full-spectrum lighting during partly cloudy conditions. Pulsing lightening accentuates the speed and directional movement of the aircraft, thereby increasing aircraft recognition and significantly decreasing bird strikes. Procedures and familiarisation training will optimise the use of such fitted systems.
- Note:** Pulsed lights functionality is an affordable retrofit as in most cases it is easy to implement on helicopters in combination with the already installed lights.

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[Precise Flight Pulselite for Rotorcraft](#)



- The windshields of most General Aviation aircraft are not designed and certified to withstand a bird strike. If the aircraft has windshield heating, its use, in accordance with the Pilots Operating Handbook or Flight Manual, will make the windshield more pliable and better able to withstand bird impact.
- If a bird appears to be on an exact collision course the pilot should carry out an avoidance manoeuvre with an upward vector as most birds will break downwards once they recognise the conflict in their flight path. Care should be taken not to overstress or 'overtorque' the aircraft, and a verbal warning to other crew and passengers should be given if possible.
- If a bird strikes you or your helicopter, try to stay calm and keep focus on your flying duties. Watch out for damages which might impair flight parameters. Stick to the principle: Aviate! Navigate! Communicate!
- Should a bird strike be known to have occurred, or strongly suspected, land the aircraft as soon as practical and carry out a **full inspection** with the rotors stopped. Engineering advice should be sought prior to return to service.
- Share the information within your own organisation or operation and with operators in your region. Report the occurrence with the known reporting channels. This is important to others in order to provide an early warning for when similar flight paths are envisaged to be flown by others!

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[Bird Strike Cabri G2 Helicopter; 50h inspection by Mona Seeberger](#)



Example of Land Development and likely large bird types.

The EASA SIB Rotorcraft Operational Safety Procedures to Mitigate Bird Strike Risk of Jan/Feb/March 2021 (TBD) provides in Annex A an example of Land Development and likely large bird types.

For more information on bird types, refer for instance to the FAA Wildlife Hazard Mitigation website and resources website and the Transport Canada "Sharing the Skies", An Aviation Guide to the Management of Wildlife Hazards - Transport Canada (TC 13549), Chapter 3 - Birds - A Primer.

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