



Australian Government

Australian Transport Safety Bureau

Birdstrike involving Glasair Sportsman GS-2, N666GM

near Bathurst, New South Wales, 24 December 2015

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Addendum

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Birdstrike involving Glasair Sportsman GS-2, N666GM

What happened

On 24 December 2015, the pilot of a Glasair Sportsman GS-2, registered N666GM, was conducting a private flight from Southport, Queensland, to Moruya, New South Wales (NSW). The pilot was the only person on board.

The pilot landed at Mudgee, NSW, to add fuel, before continuing to Moruya. While en route between Mudgee and Moruya, the aircraft collided with a large bird, believed to be a wedge-tailed eagle. At the time of the birdstrike, the aircraft was cruising at about 5,500 ft above mean sea level,¹ over mountainous terrain, and below a solid layer of cloud. The autopilot was engaged, but not in a mode that would hold a set altitude. The airspeed was about 140 kt.

The bird broke through the windscreen on the left side of the aircraft and struck the pilot. The collision left the pilot with serious facial injuries and they were temporarily unable to see (due to the effects of the impact). The pilot had been wearing a headset and spectacles, which were both dislodged and damaged during the collision.

Following the birdstrike, the aircraft entered an uncommanded and rapid descent. The extreme wind-rush and noise, combined with the effects of their serious injuries, meant that the pilot was not immediately aware that the aircraft was descending.

Despite the extreme circumstances, the pilot recovered sufficiently to manually override the autopilot and control the aircraft sufficiently to prevent a collision with terrain. Although the pilot continued to have difficulty seeing, they were able to apply full power and establish the aircraft in a climb. Following recovery from the initial urgency of the situation, the pilot was able to settle the aircraft in level flight, clear of the surrounding terrain.

The pilot elected to leave the autopilot engaged to assist with aircraft control, because the circumstances made it extremely difficult to continuously monitor airspeed and the flight path of the aircraft. With the autopilot still engaged, the pilot made overriding manual corrections to the flight path as required.

The pilot was able to locate the microphone of the headset by following the headset cord (by hand). The headset itself was substantially damaged and the pilot could only locate the microphone and one broken ear-cup. The pilot transmitted a MAYDAY² call using the damaged headset, hopeful that the microphone was functional despite the apparent damage. Air traffic control (ATC) received the MAYDAY call at about 1300 Eastern Daylight-saving Time (EDT) (see later section titled *Air traffic control aspects*).

Under the circumstances, the pilot was unable to ascertain an accurate position, so just referenced Mudgee and Moruya in the MAYDAY call. Damage to the headset prevented the pilot receiving transmissions, so they were unable to hear any acknowledgement of the MAYDAY call, and consequently were unsure if the transmission was successful. In addition to the MAYDAY call, the pilot attempted to communicate with an associate via a text message, in the hope that their associate may be able to alert relevant authorities.

The pilot succeeded in navigating the aircraft away from the more mountainous terrain. The aircraft was still tracking towards Moruya, but because Moruya was over an hour away, and with

¹ The aircraft was over mountainous terrain at the time of the birdstrike, suggesting that the height above ground level was substantially less than 5,500 ft.

² MAYDAY is an internationally recognised radio call for urgent assistance.

high terrain en route, the pilot began considering diversion options. By referencing an iPad mounted in the cockpit, the pilot was able to identify a built-up area, and track towards that area in anticipation of being able to locate an aerodrome. The pilot sent another text message to their associate with updated information, and made another MAYDAY call. Although uncertain at the time, the pilot believed that the built up area was the city of Bathurst, and was broadly aware of the location of Bathurst Airport relative to the city.

The pilot had been flying with the autopilot engaged, holding a high nose attitude, at relatively low airspeed (with the engine at full power) to try to reduce the wind rush and noise. The pilot had also selected half flap, to provide some margin over the aerodynamic stall³ speed. Although concerned about aircraft controllability and the effect of their injuries, the pilot disconnected the autopilot in order to navigate the aircraft towards the anticipated location of the airport. While handling the aircraft carefully, mindful that the birdstrike may have damaged the wings and/or tail section of the aircraft, the pilot was able to locate and overfly Bathurst Airport.

Although unable to see the windsock, the pilot decided that runway 35 was the preferred runway under the circumstances. The pilot made another emergency (MAYDAY) call and positioned the aircraft for a landing via a wide circuit. Despite continuing problems with the wind-rush and noise, and the effect their injuries, the pilot concentrated on maintaining a safe airspeed during the approach, and landed successfully.

After landing, the Airport Safety Officer met the aircraft and provided the pilot with parking instructions. The pilot shut the aircraft down and medical services were called. Aside from the damage to the windscreen (Figure 1) and some relatively minor marks around the propeller, there appeared to be no other damage to the aircraft. The remains of the bird were retrieved from the cockpit (Figure 2).

Figure 1: Damage to the aircraft windscreen



Source: Bathurst Airport Staff

³ Aerodynamic stall is a term used when the wing is no longer producing enough lift to support the weight of the aircraft.

Figure 2: Some of the bird remains retrieved from the cockpit



Source: Pilot

Pilot comments – use of the autopilot

At the time of the birdstrike, the autopilot was set to hold the heading selected by the pilot, and neutral/zero vertical speed (level flight). This was in anticipation of entering a climb and manoeuvring when a suitable gap appeared in the overlying cloud cover. In this mode, however, the autopilot allowed the aircraft to descend rapidly following the birdstrike. The pilot believed that had the autopilot been set to hold a specific altitude, the aircraft may have maintained that altitude rather than entering an uncommanded descent. Under the circumstances, given the extent to which the pilot was incapacitated (particularly immediately following the birdstrike), altitude hold mode may have been preferable.

Additionally, the pilot believed that continuing to use the autopilot following the birdstrike was a good strategy, given the effect of their injuries and their inability to see clearly. While use of the autopilot reduced the likelihood of a loss of control, the pilot was still able to manually override the autopilot to adjust the flight path of the aircraft as required.

Air traffic control aspects

The pilot's initial MAYDAY call indicated that the aircraft had been involved in a birdstrike and that the pilot was unable to see. The call also included reference to aircraft control difficulties and mentioned Mudgee and Bathurst. ATC acknowledged the call and initiated a Distress Phase.⁴ ATC requested the callsign and location of the aircraft, which were not included or not clear from the MAYDAY call, but there was no response from the pilot. ATC attempted to establish contact with the incident pilot through the pilot of another aircraft who also heard the MAYDAY call, but those attempts were also unsuccessful. ATC also asked the pilots of other aircraft in the area to maintain a listening watch on relevant frequencies.

The pilot of the incident aircraft transmitted another MAYDAY call about a minute after the initial call, indicating that the aircraft was over hills and the windscreen was broken. The pilot added that they had no headset, and repeated that they were unable to see. No further calls or details were received by ATC from the pilot.⁵

Among other activities in response to the situation, ATC contacted the Airport Safety Officer at Bathurst Airport to see if they were aware of any aircraft that was missing or experiencing

⁴ A Distress Phase (DISTRESFA) is an emergency phase declared by ATC when there is reasonable certainty that the aircraft and its occupants are threatened by grave and imminent danger and require immediate assistance.

⁵ The pilot remembered making more emergency calls than the two initial MAYDAY calls, but ATC did not receive the later calls.

difficulty. At that point, the Airport Safety Officer was unaware of the situation, and unable to provide any information.

At about 1330, the Airport Safety Officer at Bathurst airport contacted ATC to advise that an aircraft with a broken windscreen was in the process of landing. Several minutes later, they called ATC again, this time to inform them that the aircraft had landed at Bathurst. The Airport Safety Officer was able to provide more relevant information, following which ATC cancelled the DISTRESFA.

ATSB comment

In 2014, the ATSB published a research report (AR-2014-075) titled [Australian aviation wildlife strike statistics](#). The report provides some insights into the nature and characteristics of birdstrikes, and comments that a birdstrike involving a general aviation aircraft is more likely to cause aircraft damage than a birdstrike involving an air transport category or military aircraft.

The August 2010 edition of the Flight Safety Foundation magazine, *AeroSafety World*, includes an article titled [Bird Strike Mitigation Beyond the Airport](#). The article includes some comments relevant to this occurrence, including:

While general aviation airplanes typically do not have the same engine ingestion concern as transport category jets, their overall design and certification make them much less able to resist damage from bird strikes. Mid-size to large birds can penetrate the windshields and can cause pilot incapacitation or disorientation, resulting in loss of control. The drag caused by the loss of the windshield has also resulted in accidents because enough thrust is not always available to overcome the huge drag increase. Likewise, collision-caused deformation of wing or tail surfaces can increase stall speed considerably and affect handling qualities, especially at slower speeds.

If birds are encountered en route, on climb or descent, the flight crew should pull up — consistent with good piloting technique — to pass over the birds. If birds see the aircraft, they will treat it as an obstacle, but may misjudge the closing speed because the threat is usually beyond their experience.

Birds may turn or dive as avoidance maneuvers, but they rarely climb. So pulling up is the best and fastest avoidance maneuver.

Safety message

Birdstrikes continue to present a serious hazard to aviation, and can cause substantial damage. Such damage has the potential to significantly adversely affect the performance and handling qualities of an aircraft. In this case, despite the damage to the aircraft and their injuries, the pilot effectively managed an extremely challenging situation, resulting in a positive outcome.

This accident highlights to pilots the importance of regular position updates with respect to in-flight diversion options. An ongoing awareness of diversion options may assist pilots in dealing effectively with a stressful and challenging in-flight emergency, particularly where time is critical.

When declaring an emergency, pilots are encouraged to relay as much relevant information as reasonably possible. Although in this event, the damage to the aircraft and injuries to the pilot made all communications very difficult, positional information and information with respect to the intentions of the pilot may be critical to an effective response by emergency services.

General details

Occurrence details

Date and time:	24 December 2015 – 1300 EDT	
Occurrence category:	Accident	
Primary occurrence type:	Birdstrike	
Location:	near Bathurst, New South Wales	
	Latitude: 33° 24.6' S	Longitude: 149° 39.1' E

Aircraft details

Manufacturer and model:	Glasair Sportsman GS-2	
Registration:	N666GM	
Serial number:	7324	
Type of operation:	Private – Pleasure/Travel	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – 1 (Serious)	Passengers – 0
Aircraft damage:	Minor	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action. The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to operations involving the travelling public.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements. The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.