

AA2022-2

**AIRCRAFT ACCIDENT  
INVESTIGATION REPORT**

**PRIVATELY OWNED  
JA001T**

**June 30, 2022**

The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board and with Annex 13 to the Convention on International Civil Aviation is to determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. It is not the purpose of the investigation to apportion blame or liability.

TAKEDA Nobuo  
Chairperson  
Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

(Reference)

The terms used to describe the results of the analysis in "3. ANALYSIS" of this report are as follows.

- i) In case of being able to determine, the term "certain" or "certainly" is used.
- ii) In case of being unable to determine but being almost certain, the term "highly probable" or "most likely" is used.
- iii) In case of higher possibility, the term "probable" or "more likely" is used.
- iv) In a case that there is a possibility, the term "likely" or "possible" is used.

# AIRCRAFT ACCIDENT INVESTIGATION REPORT

June 10, 2022



Adopted by the Japan Transport Safety Board

Chairperson	TAKEDA Nobuo
Member	SHIMAMURA Atsushi
Member	MARUI Yuichi
Member	SODA Hisako
Member	NAKANISHI Miwa
Member	TSUDA Hiroka

<b>Company</b>	Privately owned
<b>Type, Registration Mark</b>	Cessna 525A JA001T
<b>Incident Class</b>	Damage to the airframe from a bird strike
<b>Date and Time of the Occurrence</b>	At about 08:11 Japan Standard Time (JST: UTC+9 hours), April 14, 2021
<b>Site of the Accident</b>	Approximately 2 nm west of Yao Airport at an altitude of approximately 500 ft

## 1. PROCESS AND PROGRESS OF THE ACCIDENT INVESTIGATION

<b>Summary of the Accident</b>	<p>During the take-off climb from the airport on Wednesday, April 14, 2021, the aircraft collided with a bird and sustained damage to the airframe.</p> <p>On April 27, 2021, it revealed that the extent of the damage to the aircraft required major repair, and the event is classified as an aircraft accident.</p> <p>The captain and six passengers were onboard, and there were no injuries.</p>
<b>Outline of the Accident Investigation</b>	<p>An investigator-in-charge and an investigator were designated on April 27, 2021, to investigate the accident.</p> <p>Comments on the draft Final Report were invited from the parties relevant to the cause of the accident, Japan Civil Aviation Bureau and the Relevant State.</p>

## 2. FACTUAL INFORMATION

<b>Aircraft Information</b>	
Aircraft type:	Cessna 525A
Serial number: 525A-0311	Date of manufacture: June 25, 2006
Airworthiness certificate: No. DAI-2020-429	Validity: November 13, 2021
<b>Personnel Information</b>	
Captain:	Age: 60
Airline transport pilot certificate (Airplane)	December 14, 1994
Pilot competency assessment	
	Expiration date of piloting capable period: February 23, 2022
Type rating for Cessna 525	December 17, 2008
Class 1 aviation medical certificate	Validity: October 3, 2021

Total flight time

8,207 hours 01 minute

Flight time on the same type of aircraft

2,167 hours 25 minutes

### Meteorological Information

Aviation routine weather report (METAR) for the airport as of 8 o'clock on the day of the accident was as follows:

Wind direction 220°; Wind velocity 4 kts; Wind direction variable between 190° and 290°;

Prevailing visibility 10 km or more

Cloud: Amount 1/8, Type Stratus, Cloud base 500 ft

Amount 3/8, Type Stratus, Cloud base 1,000 ft

Amount 5/8, Type Cumulus, Cloud base 2,500 ft

Temperature 16°C; Dew point 15°C, Altimeter setting (QNH) 29.80 inHg

### Event Occurred and Relevant Information

#### (1) History of the flight

On April 14, after the captain confirmed in the preflight exterior check that there was no anomaly in the airframe, the aircraft took off from runway 27 at the airport at 08:10 under the instrument flight rules. During the climb, the aircraft entered the clouds at the indicated airspeed of approximately 150 kts at an altitude of approximately 500 ft.

Immediately thereafter, a flock of 10 birds or so suddenly appeared in front of the aircraft from the interval of the clouds and instantly passed by. As a sound supposedly of collision of something with the aircraft was heard from the aft airframe, the captain judged that there was a high probability of a bird strike and requested the airport traffic controller on Kansai Approach for returning to the airport for the checking at 08:11:33 at an altitude of 2,500 ft.

After climbing to 5,000 ft by the instruction of the ATC, the aircraft approached the airport by instrument flight rules and normally landed back on runway 27 at 08:26.

During the flight after the bird strike, there occurred no

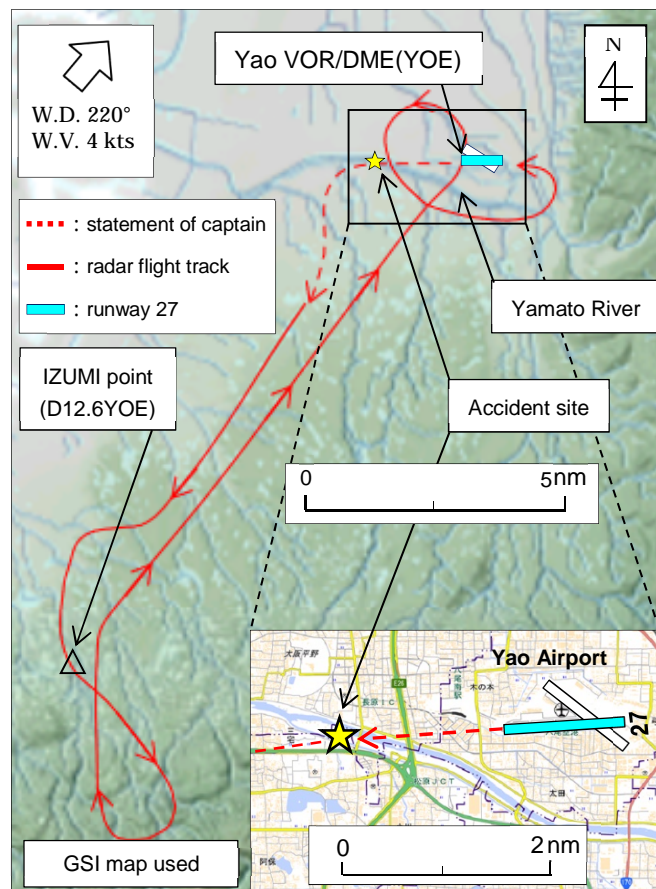


Figure 1 Estimated flight route map

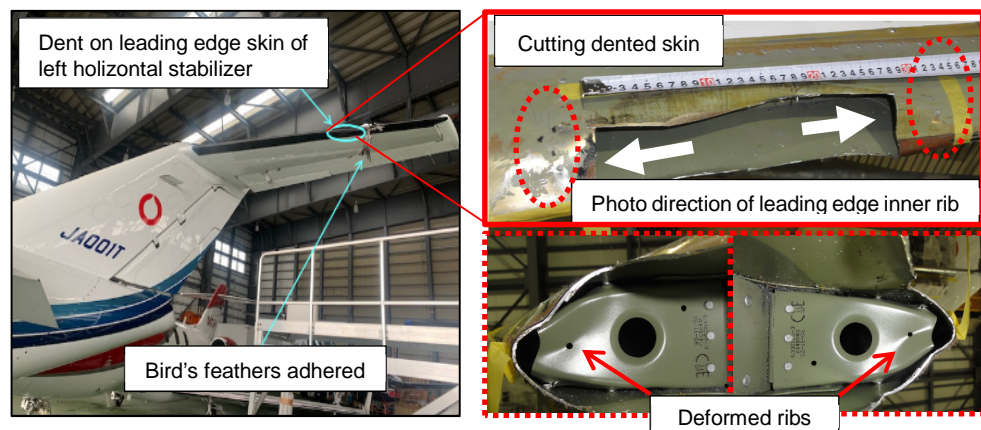


Figure 2 Damaged portions

anomaly such as abnormal instrument indication of engine parameters or airframe vibrations.

As the post-landing inspection found that part of horizontal stabilizer was damaged, the detailed inspection was conducted, and it revealed on April 27 that the extent of the damage to the aircraft required major repair. Besides, checking the airport including the runway conducted by Osaka Regional Civil Aviation Bureau Yao Airport Office (hereinafter referred to as “the Airport Office”) before the operation hours (08:00 until 19:30) on the day of the accident, it found no bird.

(2) Information on damage to the aircraft

Extent of damage: substantial

Conditions of damage: dent on the leading edge skin of the left horizontal stabilizer and deformed ribs (size of dent: 9 cm long, 41 cm wide, and 5 cm deep; all figures are approximate)

(3) Information on the bird collided and the accident site

DNA testing of the bird’s feathers adhered to the horizontal stabilizer of the aircraft revealed that the species of the bird was a gray heron\*<sup>1</sup>.

The guideline for the bird strike prevention program\*<sup>2</sup> (page 8 of Appendix 1) assessed the risk of a gray heron as, “categorized as one of the most dangerous birds because of its heavy weight and a high probability of causing damage to aircraft, if collided, although frequency of collision with aircraft is low.” In the surrounding areas of the airport including the accident site, rivers and ponds that could be feeding areas and tumulus and green parks that could be breeding grounds for gray herons were scattered.



Figure 3 Gray heron

( excerpted from materials for the guideline for the bird strike prevention program )

(4) Bird strike occurrence situation at Yao Airport

According to the bird strike information sharing site\*<sup>3</sup>, there were 13 cases of bird strike related to the airport during the period from August 2010 to May 2021 reported by flight operators to Civil Aviation Bureau, the Ministry of Land, Infrastructure, Transport, and Tourism as of June 8, 2021. Among these 13 cases, this was the only case of the bird strike by a gray heron, and also the only case of the bird strike that was investigated by the Japan Transport Safety Board (JTSB). Altitudes of the 13 collisions reported were split into eight cases of 50 ft or less above ground level (AGL) (at the time of take-off and landing at the airport); four cases including this accident (species of the birds: one each of a gray heron, kestrel, skylark, and unknown) of 130 to 500 ft AGL over take-off route of runway 09/27 (corresponding to the take-off climb area outside the airport); and one unknown AGL.

\*<sup>1</sup> According to the DNA species discrimination test report and the guideline for the bird strike prevention program (page 8 of Appendix 1), a gray heron belongs to Ardeidae with overall length of 90 to 98 cm, weight of 1.02 to 2.073 kg, wing length of 42.0 to 48.5 cm, and tail length of 15.7 to 18.7 cm, diurnal, and lives in such as coast, river, pond and swamp, paddy field, or tideland, forms colony in trees or bamboo forest, and takes a lot of bait even in the day time in breeding season of April.

\*<sup>2</sup> The guideline for the bird strike prevention program was established in December 2013 (amended in May 2021) by the Committee for Exploring Measures against Bird Strikes established by the Civil Aviation Bureau of the Ministry of Land, Infrastructure, Transport, and Tourism for the purpose that airport management authority developed effective bird strike prevention program. The guideline summarized such as species of troublesome birds that caused a lot of cases of bird strike in the surroundings of airports and significant damage to aircraft when collided, proposal, efforts, and best practice related to bird strike preventive measures by the Committee, and bird strike occurrences in foreign countries.

\*<sup>3</sup> Only those who are allowed to access to the site by the Civil Aviation Bureau can browse.

#### (5) Bird strike preventive measures in place at Yao Airport

The Airport Office established “Wild animal collision prevention program 2021 at Yao Airport” based on the Yao Airport wild animal collision prevention procedures (hereinafter referred to as “the Procedures”), gathered and recorded bird strike information, assessed ecology of birds, assessed the risk of bird strike, and at the same time, as a means to prevent collisions, mowed the grass at the airport, and expelled harmful birds with emitting smoke or using a vehicle horn as needed. Besides, the Airport Office shared information on bird appearance checking at the airport (species of birds, place of appearance, size, number, season, and time) through the information sharing site for the airport personnel\* 4 and called for attention. According to the said bird appearance checking, six birds of ardeidae were observed throughout the year in the drainage in the green area or waterfront of regulating reservoir of the airport.

### 3. ANALYSIS

(1) The JTSCB concludes that it is most likely that since the dent and the bird’s feathers adhered on the leading edge of the left horizontal stabilizer, which were not observed during the preflight inspection, were observed during the post-landing inspection of the aircraft; furthermore the captain heard the sound supposedly of collision of a bird with the aft airframe when the flock of the birds passed by during the take-off climb at the indicated airspeed of 150 kts at an altitude of 500 ft over approximately 2 nm west of the airport, the JTSCB concludes that it is most likely that the aircraft collided with the bird among the flock at this moment and sustained the damage to the airframe.

(2) DNA testing of the bird’s feathers adhered to the airframe revealed that the species of the bird was a gray heron. In view of the weight of a gray heron, although frequency of collision is low, and the impact of damage to airframe, if collided, which cannot be ignored, the Airport Office is desirable that gathering and sharing information continue and measures based on the risk assessment be studied.

(3) The JTSCB concludes that it is most likely that the captain did not have time to take evasive maneuver since the flock of the birds suddenly appeared from the interval of the clouds the aircraft entered during the take-off climb.

### 4. PROBABLE CAUSES

The JTSCB concludes that the probable cause of the accident was most likely that the aircraft collided with the bird approximately 2 nm west of Yao Airport at an altitude of approximately 500 ft during the take-off climb from the airport that caused the damage to the airframe.

### 5. SAFETY ACTIONS

To clarify bird strike preventive measures in the surroundings of Yao Airport, the Airport Office amended the Procedures (dated October 28, 2021), surveyed the ecology of the birds’ environment in the surroundings of the airport (situation of lakes and a wildlife sanctuary) and its maintenance program in collaboration with personnel and organizations concerned, on top of that to consider measures to reduce the risk of bird strike.

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\* 4 Only those who are allowed to access by the Airport Office can browse.