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INVESTIGACIÓN  
DE **A**CCIDENTES  
E **I**NCIDENTES DE  
**A**VIACIÓN **C**IVIL

## Report A-046/2019

Accident involving a ROLLANDER  
SCHNEIDER aircraft, registration  
F-CESR, in the vicinity of Pico  
Bisaurín (Huesca) on  
21 August 2019



GOBIERNO  
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## **FOREWORD**

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission (CIAIAC) regarding the circumstances of the accident object of the investigation, and its probable causes and consequences.

In accordance with the provisions in Article 5.4.1 of Annex 13 of the International Civil Aviation Convention; and with articles 5.5 of Regulation (UE) n° 996/2010, of the European Parliament and the Council, of 20 October 2010; Article 15 of Law 21/2003 on Air Safety and articles 1., 4. and 21.2 of Regulation 389/1998, this investigation is exclusively of a technical nature, and its objective is the prevention of future civil aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent from their reoccurrence. The investigation is not pointed to establish blame or liability whatsoever, and it's not prejudging the possible decision taken by the judicial authorities. Therefore, and according to above norms and regulations, the investigation was carried out using procedures not necessarily subject to the guarantees and rights usually used for the evidences in a judicial process.

Consequently, any use of this report for purposes other than that of preventing future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.

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## **Abbreviations**

°	Degrees
° ' "	Sexagesimal degrees, minutes and seconds
AENA	Aeropuertos Españoles y Navegación Aérea
AESA	Spain's National Aviation Safety Agency
AIP	Aeronautical information publication
ARP	Aerodrome reference point
cm	Centimeters
CIAIAC	Civil Aviation Accident and Incident Investigation Commission
EASA	European Aviation Safety Agency
ENR	En route. Section of an aeronautical information publication
EU	European Union
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FFVV	Fédération Française de Vol en Planeur (French Gliding Association)
ft	Feet
h	Hours
Km / h	Kilometers per hour
Kg/m <sup>2</sup>	Kilograms per square meter
LECI	Aerodrome of Santa Cilia (Huesca)
m	Meters
m <sup>2</sup>	Meters squared
MHz	Megahertz
s	Seconds
SEO	Spanish Ornithological Society
UTC	Coordinated universal time
VFR	Visual flight rules

## **Synopsis**

Owner and operator:	Private
Aircraft:	ROLLANDEN SCHNEIDER, registration F-CESR
Date and time of accident:	21 August 2019 at 15:31 (local time <sup>1</sup> )
Site of event:	Vicinity of Pico Bisaurín (Huesca)
Persons on board:	One (uninjured)
Flight rules:	VFR
Type of flight:	General aviation. Private
Date of approval:	27 November 2019

### **Summary of event**

On 21 August 2019, a ROLLANDER SCHNEIDER glider, registration F-CESR, took off from the aerodrome of Santa Cilia (Huesca) on a local flight.

As it was flying in the vicinity of Pico Bisaurín, in the Pyrenees, a vulture struck its right wing, near the midpoint and close to the leading edge, causing a hole in the wing.

The pilot was able to control the aircraft and return to the aerodrome, where he landed normally.

The investigation has concluded that the accident was caused by a bird strike involving a griffon vulture in an area containing many specimens of this species.

The evasive maneuver performed by the pilot upon first noticing the presence of a vulture – lifting the front of the aircraft to gain altitude and protect the tail cone – was correct.

A contributing factor is the extraordinary increase in the population of griffon vultures experienced in Spain in recent decades due to, among other reasons, the proliferation of areas made available in Spain's various regions as feeding sites for necrophagous birds.

The following safety recommendation is issued:

REC. 25/2019. It is recommended that the Ministry for the Ecological Transition and the Demographic Challenge, in order to prevent accidents involving aviation safety, apply the exceptions considered in Article 61.1.b) of Law 42/2007 of 13 December, on Natural Heritage and Biodiversity, to the griffon vulture (*Gyps fulvus*) population, thereby reversing the prohibitions laid out in Chapter I of said law.

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<sup>1</sup> Unless otherwise specified, all times in this report are local. To obtain UTC, subtract 2 hours from local time.

## 1. FACTUAL INFORMATION

### 1.1. History of the flight

On 21 August 2019 at 14:48, a ROLLANDEN SCHNEIDER glider, registration F-CESR, was towed into the air at the aerodrome of Santa Cecilia – LECI (Huesca), after which it headed to the Pyrenean mountains located north of the airfield.

According to information provided by the pilot, as he was flying at an altitude of 2400 m, north of the town of Aisa (Huesca), over the slopes of Pico Bisaurín, he tried to catch an updraft toward his right while flying at an approximate speed of 110 km/h. He then saw a vulture below and ahead of him, so he reduced his speed slightly to avoid it while turning left and climbing in order to avoid impacting it.

At that point he saw another vulture in the same direction he had turned to, but flying toward him at the same altitude. The vulture violently impacted his aircraft at around the midpoint of the left wing, near the leading edge and the area where the airbrake is located.

According to his statement, he instantly checked the elevator and rudder controls carefully but did not touch the flaps or airbrakes. He immediately got on the radio, on the 123.50 MHz frequency, and informed both the pilot who had towed him and the other French pilots who were flying in the area, after which he headed for the departure aerodrome, flying normally.

He eventually landed at 15:31 at an approximate speed of 81 km/h and, as per his statement, with the airbrakes and flaps deployed.

He was not injured and he exited the aircraft under his own power.

The glider had a hole at the midpoint of the left wing that measured about 40 cm long by 20 cm wide, crossing the wing perpendicularly.



Figure 1. Aircraft after landing

## **1.2. Injuries to persons**

Injuries	Fatal	Serious	Minor/None
Crew	-	-	1
Passengers	-	-	-
Other	-	-	-

## **1.3. Damage to aircraft**

Significant.

## **1.4. Other damage**

None.

## **1.5. Personnel information**

The 61 year old pilot had a glider pilot license issued by the French Gliding Federation (FFVV), as well as the appropriate class-2 medical certificate, both of which were valid.

He had approximately 2200 flight hours over the course of 19 years, during which he flew in both the Pyrenees and the Alps mountain ranges.

## **1.6. Aircraft information**

The ROLLADEN-SCHNEIDER LS3 is a single-seat glider with a one-wheel retractable main landing gear. It has a wingspan of 17 m, a length of 6.86 m, a height of 1.32 m and a wing surface area of 10.5 m<sup>2</sup>.

It has a wing load of 44.86 kg/m<sup>2</sup> and an empty weight of 269 kg. The horizontal stabilizer is located in the high part of the tail.

For control surfaces it has flaperons, which can be moved up (positive positions) and down (negative positions) when used as flaps. The flaperon control, along with the control for the airbrakes and the landing gear, are located to the left of the pilot, such that the three controls cannot all be operated at once.

The aircraft involved in this event was an LS 3-17 model that was manufactured in 1980. Its serial number was 3453 and its registration was F-CESR.

It had a certificate of airworthiness that was issued on 30 August 2008 and renewed on 2 July 2019, with 4226:06 flight hours on the aircraft.

Between that time and the accident, it had flown an additional 13:30 h, for a total of 4239:36 h.



The last maintenance check was conducted on 23 March 2019 with 4216:01 flight hours on the aircraft.

The flight manual specifies a series of never-exceed speeds based on the flight altitudes that range from 6600 ft to 32800 ft.

It also states that the approach speed when landing must not be below 90 km/h.

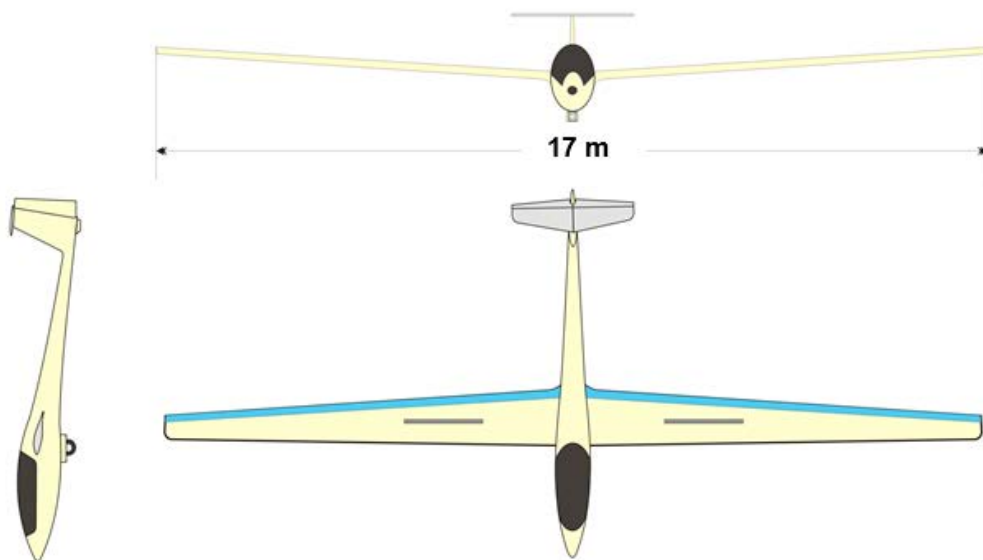


Figure 2. Views of the aircraft

### **1.7. Meteorological information**

The weather conditions were not limiting for the flight.

### **1.8. Aids to navigation**

The flight took place under visual flight rules (VFR).

### **1.9. Communications**

Not relevant to the investigation.

### **1.10. Aerodrome information**

The aerodrome of Santa Cilia–Pyrenees (LECI) is located 20 km west of the town of Jaca. Its reference point (ARP) is at coordinates 42°34'12" N 0°43'42" W, at an elevation of 684 m (2224 ft).

It is owned by the Tourism Office of the General Council of the Region of Aragon and managed by FLY-PYR SANTA CILIA. It is used for general aviation, including gliding, normally by private operators.

It has two parallel runways in a 09 / 27 orientation. The one to the North is an asphalt runway that is 850 m long and 15 m wide, and is used for general aviation.

The other is a compacted soil runway that is 612 m long and 25 m wide. It is used for glider operations.

According to aerodrome procedures, traffic in the area must make contact on 123.5 MHz and inbound aircraft are required to report at points Jaca, Bailo or Berdún. Flights are coordinated by the flight manager and must make the required position reports at all times. The circuit for powered aircraft is flown south of the airfield, regardless of which runway is in use.



Figure 3. Aerodrome of Santa Cilia–Pyrenees

### **1.11. Flight recorders**

The aircraft did not have flight recorders, as these were not required by law. It did, however, have a GPS locator device called a logger, which recorded the entire flight.

The information retrieved from the logger was used to determine that the flight began at 14:48:09 and ended at 15:31:48<sup>2</sup>.

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<sup>2</sup> The figure 4 is in UTC time

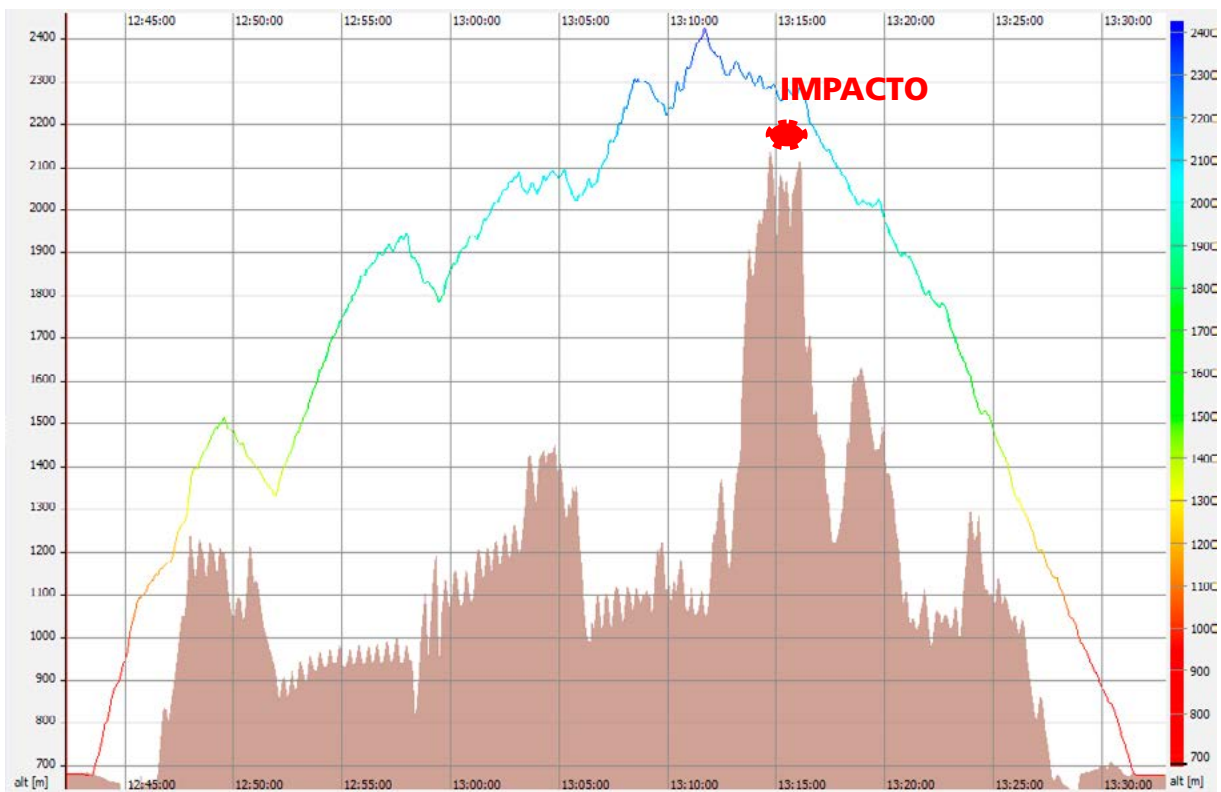


Figure 4. Flight profile

It took off from runway 27 at the aerodrome and made three left turns once north of the runway, at an altitude of 1500 m.

It then continued climbing and advancing further north of the aerodrome. Between 1700 m and 2000 m, it turned<sup>3</sup> as many as thirteen times to continue gaining altitude.

Once it reached this altitude, it made a further three turn sequences with nine, two and three turns, which allowed it to reach 2100 m as it traveled west.

After this, it moved continuously to the north to the approximate latitude of the town of Sallent de Gallego, where it began to gradually descend and return.

<sup>3</sup> All the turns were made to the left.

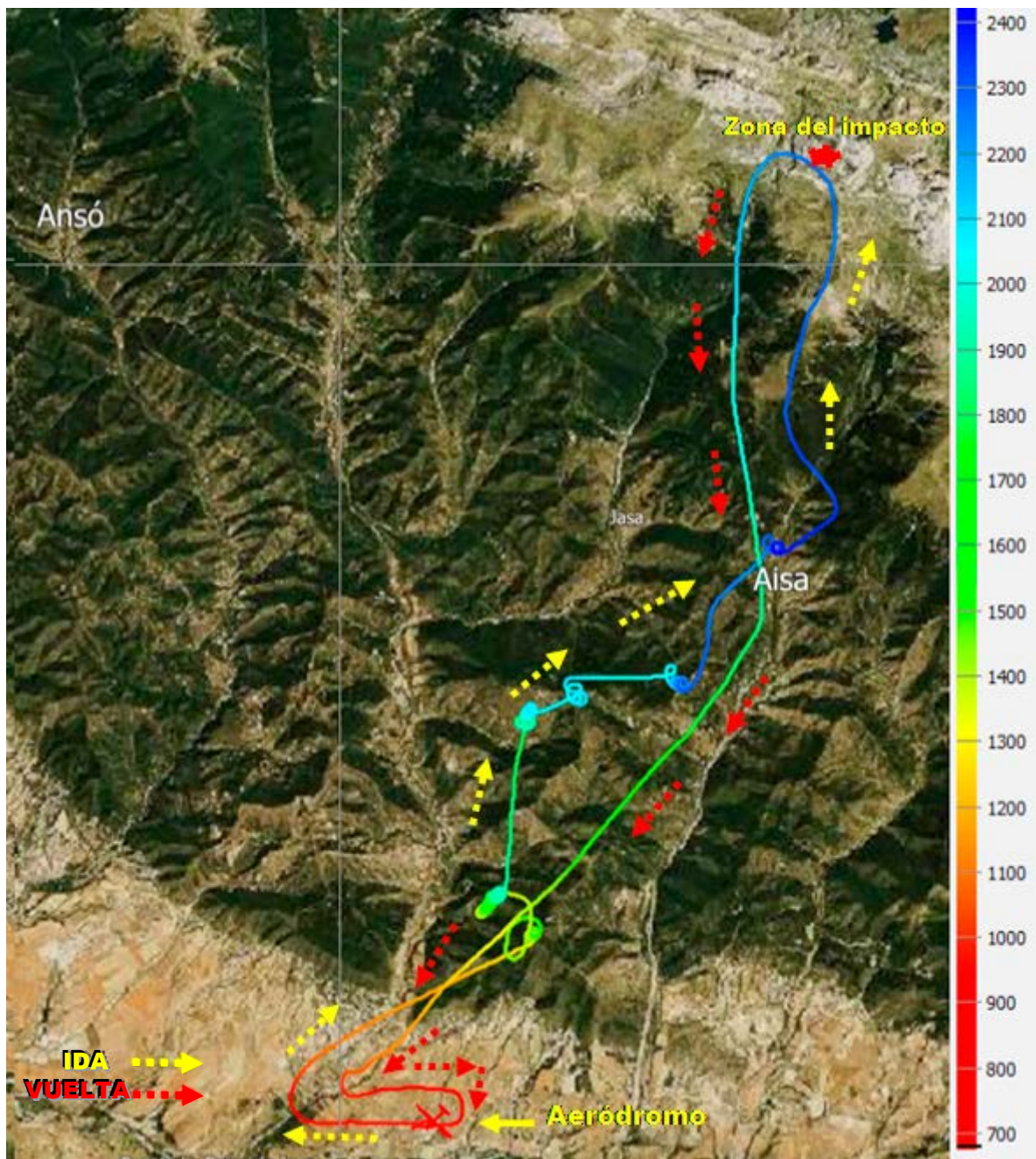


Figure 5. Overhead view of flight path

According to information provided by the pilot, the impact with the vulture occurred at an altitude of 2200 m.

He had been at that level on two occasions, once at about 15:07 while climbing, and a second time at about 15:17, while descending. The logger recorded that the aircraft continued climbing to higher altitudes after 15:07. Everything indicates that the impact occurred at 15:17.

From then on, the pilot descended constantly and gradually without turning until he reached the vicinity of the aerodrome, north of the runways. He then turned left to

enter the pattern, flying the downwind leg and turning right onto the base and final legs before landing normally.

### 1.12. Wreckage and impact information

The bird impacted the left wing, creating a hole that went from the bottom to the top surface of the wing, starting immediately after the spar on the leading edge near the part of the airbrake closest to the fuselage. It was 40 cm long (parallel to the spar) and 20 cm wide (parallel to the chord).

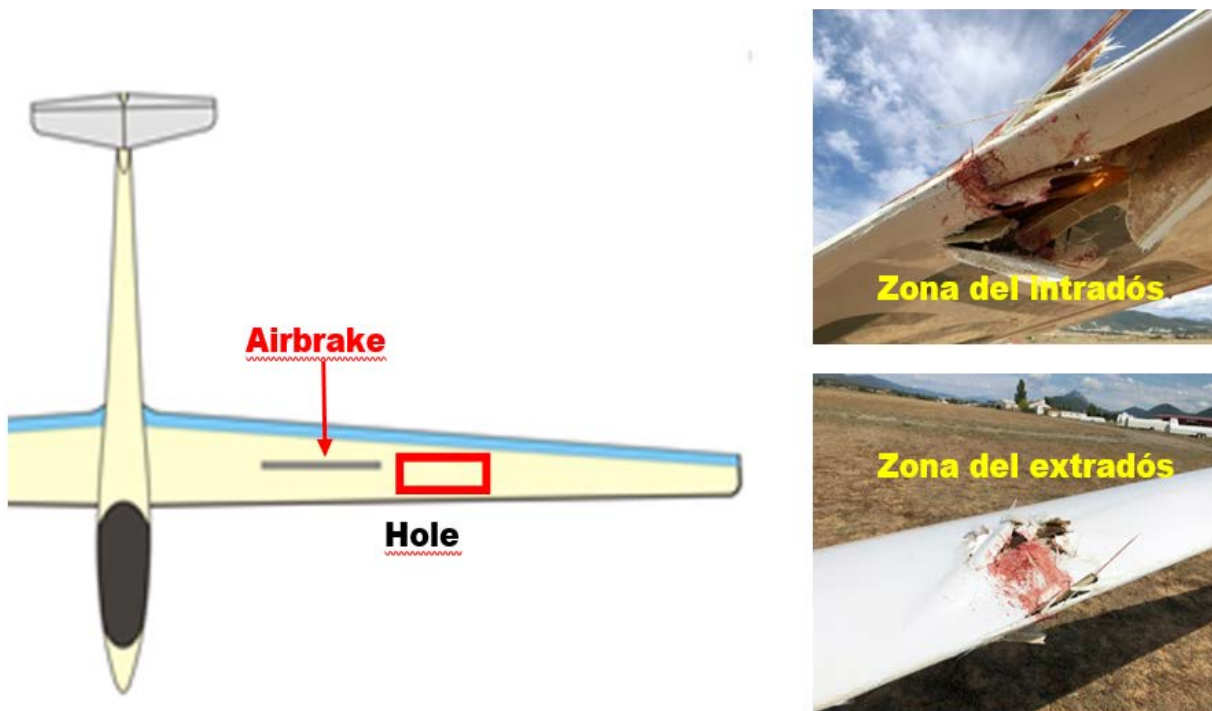


Figure 6. Damage to the aircraft

### 1.13. Medical and pathological information

Not applicable to this event.

### 1.14. Fire

There was no fire.

### 1.15. Survival aspects

The pilot was not injured.

### 1.16. Tests and research

Since the year 2000, the CIAIAC has investigated a total of twenty-two events involving bird strikes. This accounts for 2.68% of the one thousand and twelve events investigated during this time.

Of the 22 events, two, or 9.09%, involved ultralight aviation.

Bird strike events involved 0.69% of ultralight aviation events and 1.97% of all other aviation events.

The table below shows a summary of all the events investigated:

EVENT	DATE	SPECIES	PLACE	ALTITUDE (m)	OCCUPANTS KILLED	OUTCOME
IN-003/2000	26/02/2000	Griffon vulture	Navarra	3500	4 / 0	Landed
A-023/2001	20/04/2001	Seagulls	Mallorca	Takeoff	4 / 0	Landed
IN-076/2002	08/11/2002	Unknown	Salamanca	Takeoff	10 / 0	Landed
A-050/2004	30/07/2004	Griffon vulture	Segovia	1800	1 / 0	Accident
A-070/2004	28/11/2004	Common buzzard	Amsterdam	Takeoff	146 / 0	Landed
IN-012/2005	25/04/2005	Seagulls	Guipúzcoa	Takeoff	70 / 0	Landed
IN-018/2005	25/05/2005	Stork	Cádiz	2000	3 / 0	Landed
IN-027/2005	26/06/2005	Cinereous vulture	Sevilla	1000	1 / 0	Landed
IN-029/2009	11/11/2009	Cinereous vulture	Madrid	3500	2 / 0	Landed
A-038/2011	02/10/2011	Griffon vulture	Huesca	7200	2 / 2	Accident
A-001/2016	16/01/2016	Griffon vulture	Cuenca	1950	4 / 4	Accident
A-010/2016	30/03/2016	Griffon vulture	Madrid	759	3 / 3	Accident
A-016/2016	19/05/2016	Griffon vulture	Navarra	3500	3 / 3	Accident
A-023/2016	07/07/2016	Griffon vulture	Huesca	2300	1 / 0	Landed
A-018/2017	15/08/2017	Stork	Cádiz	203	1 / 1	Accident
A-010/2018	27/03/2018	Seagull	Murcia	Takeoff	130 / 0	Did not take off
IN-019/018	13/05/2018	Griffon vulture	Valencia	4500	2 / 0	Landed
A-018/2018	15/05/2018	Griffon vulture	Segovia	1800	1 / 1	Landed
A-016/2019	10/04/2019	Griffon vulture	Huesca	Takeoff	2 / 0	Landed
A-046/2019	21/08/2019	Griffon vulture	Huesca	2400	1 / 0	Landed
ULM A-009/2013	04/08/2013	Griffon vulture	Navarra	Unknown	2 / 2	Accident
ULM-A-009/2019	19/05/2019	Unknown	Canary Islands	144	1 / 0	Landed

Of the twenty-two events investigated involving bird strikes, in seven cases (31.81%) the aircraft was involved in an accident, resulting in 16 fatalities, with one person being uninjured.

It is notable that over the last 20 years, since 2016, i.e. in the last four years, ten accidents have taken place, accounting for nearly half (45.45%) of all the bird-related accidents during this period.

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In 12 of the events (54.54%), the bird was a griffon vulture.

As a result of all the events mentioned, six safety recommendations were issued involving three accidents, and one incident, which were intended to prevent bird strikes.

The recommendations issued in the reports associated with investigations A-070/2004, IN-012/2005, A-010/2016 and A-016/2016 were as follows:

### Involving **A-070/2004**

RECOMMENDATION 20/2005.- It is recommended that the Boeing company send to all operators of the Boeing 737 an information document on in-service experience, or a similar document, to inform flight crews and maintenance personnel of the dangerous effects that a bird strike in the nose area could have on the nosewheel steering system, and of the precautions to take in that eventuality. The document should underscore the importance of strictly adhering to the instructions in publication 737-FTD-32-03008 to avoid wear on the cables in this system.

RECOMMENDATION 27/2005.- It is recommended that the FAA review the FAR-25 requirements to ensure that, when feasible, the parts of the nosewheel steering system that are prone to damage from bird strikes that could pose a serious danger to the airplane be properly protected against these impacts.

The two recommendations are closed, but while the action taken for the former was deemed acceptable, a satisfactory response was not received for the latter.

### Involving **IN-012/2005**

RECOMMENDATION 15/2008.- It is recommended that AENA–Control enhance controller training so as to familiarize them with the risks of bird strikes in those areas where they render their service by providing them with knowledge of dangerous species and their characteristics, flocking behavior, sizes, etc.

RECOMMENDATION 16/2008.- It is recommended that AENA establish operating procedures in control towers to ensure that birds are monitored and tracked in the maneuvering area, taxiways and runways of all airports and to enforce said procedures.

These recommendations are closed since satisfactory actions were taken to comply with them.

### Involving **A-010/2016**

RECOMMENDATION 58/2016.- It is recommended that ENAIRE update the bird concentration chart and the migratory routes chart for the larger birds contained in the AIP dated 26 December 2002 to take into account the current distribution of colonies of vultures and other birds whose inclusion in said chart is appropriate, and their migratory movements.

The response to this recommendation was satisfactory and was closed out, since the information on the presence of birds that was traditionally included in point ENR 5.6 – “Bird migrations and concentrations” of the Aeronautical Information Publication (AIP) for Spain has been improved and updated. This section of the AIP is now called “Flights of migratory birds and areas with sensitive wildlife”, and contains three bird concentration charts with updated information on birds, including griffon vultures.

In addition to the above, Spain’s National Aviation Safety Agency (AESA) published a flyer with recommendations to avoid bird strikes, and in September 2017 a brochure titled (in Spanish): *Bird strikes, a common risk with local features*.

This brochure is in part a translation of an AOPA operational safety letter and also includes the information published in the AIP and recommendations presented by the Spanish Association of Light Aircraft Pilots (AEPAL) and the Association of Pilots and Airplane Owners (AOPA) at the 1<sup>st</sup> National Forum on Aviation and Wildlife, which was held on 8 June 2017.

AESA also set up a National Aviation and Wildlife Program, pursuant to the provisions laid out by the European Aviation Safety Agency (EASA) in Regulation (EU) No 139/2014 of the Commission of 12 February 2014, and specifically in AMC ADR.OPS.B.020, which specifies the need for States to have a national program to reduce the dangers of collisions with animals.

### Involving **A-016/2016**

RECOMMENDATION 05/2018.- It is recommended that the Ministry of Agriculture, Fisheries, Food and the Environment<sup>4</sup> endorse and coordinate actions with regional governments to minimize the excessive concentration and growth of griffon vulture (*Gyps fulvus*) colonies in their areas and in Spain as a whole.

This recommendation was closed following the response received from the ministry, which was deemed UNSATISFACTORY as it argued that it was not scientifically proven that there is an excessive concentration and growth of griffon vultures in Spain and that it was the duty of the regional governments, and not the ministry, to take actions involving the management of wildlife populations, and that the resolution of this situation must not entail a reduction in griffon vulture populations in Spain.

The ministry also stated that the most efficient option was to provide detailed information to pilots on the areas and times of greatest risk and to properly manage those points where birds gather. It also thought it important to encourage, and to require when possible, aircraft to fly over 1000 m above ground level, since soaring birds are not found above that altitude.

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<sup>4</sup> This Ministry’s current name is the Ministry of Agriculture, Fisheries and Food, but the ministry now responsible for the environment is the Ministry for the Ecological Transition, and within it, the Subdirectorate General for Biodiversity and the Natural Environment.



The CIAIAC board deemed the response to be unsatisfactory and informed the ministry of this, since it thought that the Ministry for the Ecological Transition could not say it was not within its purview, as it was being asked to lead a process whose execution would be the responsibility of the regional governments so as to respect their competencies.

It was also revealed that the information used to write the report had been provided by the Spanish Ornithological Society (SEO) and the High Council for Scientific Research (CSIC–Doñana), two renowned institutions in the scientific world.

The ministry was also informed that the CIAIAC was of the opinion that in neighboring countries where the population of griffon vultures is far lower, European law was not violated and yet the result is very different in terms of aviation safety.

Lastly, the ministry was informed that detailed information was available on the effects of birds on flights in the AIP published by ENAIRE and in the flyer published by AESA on *Recommendations to prevent bird strikes*, and in the EGAST brochure “GA6 Bird strikes”, both available on the AESA website.

However, the ministry did not take said recommendation into consideration.

### **1.17. Organizational and management information**

The griffon vulture enjoys special protection from a regulatory standpoint both in Europe and in Spain, but not at the non-regional level<sup>5</sup>, since neither the griffon vulture nor the cinereous vulture is listed in the *Catalog of Threatened Species of Aragon*, regulated by Decree 49/1995 of 28 March, of the General Council of Aragon (Official Journal of Aragon nº 42 of 7 April 1995) or in Decree 181/2005 of 6 September of the Government of Aragon, which partially amended the previous one (Official Journal of Aragon nº 114 of 23 September 2005).

Both species are included in Annex I of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. This means that among other obligations, member States are required to adopt the measures necessary to ensure their conservation. In the case of Spain, this is legally enforced by way of Law 42/2007 of 13 December on Natural Heritage and Biodiversity (BOE nº 299 of 14 December 2007, amended by Law 33/2015 of 21 September (BOE nº 227 of 22 September 2015) and its implementing regulations).

Pursuant to Article 4 of the Directive, their habitat shall be subject to special conservation measures so as to ensure their survival and reproduction in their area of distribution. To this end, member States shall specifically classify the most suitable territories in number

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<sup>5</sup> According to the National Catalog of Threatened Species (RD 439/1990), it is a species of “special interest” in the regional catalogs of Navarre, Castilla-La Mancha, Madrid and Extremadura, a “vulnerable” species in the catalog of the Basque Country and officially “extinct” in the catalog of Murcia, though the population has recovered from said status in this province and is currently expanding.

and size as special protection areas for the conservation of these species. Consequently, 48 SPAs have been declared in Aragon, with a total surface area of 8913 km<sup>2</sup>.

In Spain, in addition to the aforementioned law, there is Royal Decree 139/2011 of 4 February to develop the *List of Wild Species in a Special Protection Scheme* and the *Special Catalog of Threatened Species* (BOE nº 46 of 23 February 2011), which include and define the following species:

- griffon vulture (*Gyps fulvus*). Wild species in special protection scheme. Not included in the Spanish Catalog of Threatened Species.
- cinereous vulture (*Aegypius monachus*). Wild species in special protection scheme and listed as vulnerable in the Spanish Catalog of Threatened Species.

This condition implies the effects, prohibitions, conservation guarantee and exceptions laid out in Title III, Chapter I, articles 56 to 61 of Law 42/2007.

Moreover, said law, in TITLE III, "Conservation of biodiversity", CHAPTER I, "Onsite conservation of wild autochthonous biodiversity", states in Article 58, Exceptions, in section 1.d) that the prohibitions laid out in this chapter (Article 52, "Changes to the limits of protected spaces", and Article 54, "Guarantee to conserve wild autochthonous species"), may be set aside, with the administrative authorization of the regional government, if there is no other satisfactory solution and without this harming the continued maintenance of a conservation status that is favorable to the populations in question in their natural distribution area when one of the following circumstances is applicable: in the case of birds, to prevent accidents involving aviation safety.

### **1.18. Additional information**

Although the specimen that impacted the glider was not found, meaning that the specific species cannot be known with absolute certainty, it is highly probable that it was a griffon vulture, which is much more abundant in the accident area than the cinereous vulture. It is thus practically assured that the bird strike involved a griffon vulture.

### **1.19. Useful or effective investigation techniques**

It was not necessary to employ special investigation techniques.

## **2. ANALYSIS**

During the investigation into this event, an effort was made to determine several aspects that were deemed important to aviation safety.

On the one hand, investigators studied the number of accidents and incidents caused by bird strikes in recent years in Spain, going back to 2020, which was deemed adequate to try to ascertain if the number is alarming or, in contrast, more symbolic.

We attempted to see if the distribution in time of the events was continuous, and if not, to study what could have caused it.

Moreover, we attempted to find a pattern in this type of event that could be used to offer pilots some kind of guidelines that could improve safety.

Another aspect that we wanted to study is the regulations that exist involving protecting the species and to see if it considers other, broader aspects that involve reconciling the presence of flying birds (griffon vultures in particular) with the aviation activity that takes place in the area.

We also tried to determine if the pilot's actions were appropriate, if he had sufficient training and experience to handle an event like the one he was involved in and if it is possible to provide guidelines for how to act in a situation of this kind.

Finally, we reviewed the recommendations issued by the CIAIAC over this period to see what effect they had on improving safety and to provide a guide for issuing any other recommendations that can help to improve the situation.

As concerns the first question, there have been 22 events in 20 years, which is equivalent to approximately one case per year and accounts for 2.68% of all the investigations conducted.

Bird strike events represent 0.69% in ultralight aviation and 1.97% in all other kinds of aviation.

Given these data, the problem does not seem particularly alarming.

However, the result of all these accidents and incidents was catastrophic, with 16 fatalities out of 17, meaning that in practically every case, the pilots were unable to maintain control of the aircraft after the impact.

This makes this type of accident worthy of special consideration.

But it is also important to consider that almost half of the cases that occurred during the period studied took place in just the last four years.

In 12 of the cases (54.54% of the time), the bird involved was a griffon vulture.

This fact is highly relevant and stems from a very specific cause, namely that the griffon vulture population in Spain has increased significantly in the last four decades.

The population has gone from some 2000 pairs in 1978 to around 35000 today, a constant trend that places the total number of specimens at over 100000.

While it is true that the population in Aragon has dropped somewhat in recent years, there are 563 identified colonies, 127 isolated pairs and 4832 pairs. In the province of Huesca alone there are 184 colonies (32%), 41 isolated pairs (32%) and 1,715 pairs (35%).

This population increase is no doubt due to the fact that feeding sites for necrophagous birds have been set up throughout Spain, with 54 such sites in Aragon, of which 24 are in Huesca (44.44%).

Habitats in Portugal and southern France that are similar to those in Spain have much lower populations of griffon vultures. Spain, as noted earlier, is home to 90% of all the specimens of this species found in Europe.

The population has not only grown considerably, but the behavioral habits of the species, and even its habitat, have varied due to the increased ease of finding food, which is localized in very specific areas.

This means that a general and sports aviation flight in locations with vultures has a non-negligible chance of encountering griffon vultures.

This species flies in flocks, but breeding pairs isolate themselves from the rest of the flock during the mating and rearing season.

The pairs behave more erratically and unpredictably if different specimens don't fly in the same flock, and it is important for pilots to be cognizant of this fact so they can take every precaution if they see isolated specimens, since it is highly probable that the other specimen in the couple is nearby.

When a flock is close to a glider, it is quite likely that they will be flying in circles alongside it to take advantage of thermal currents to climb without interfering in its flight path, in a way following the aircraft.

However, in the case of isolated pairs, their behavior tends to be very different and it is reasonable to expect that the animal, which is a heavy and clumsy bird, will be frightened by the presence of the aircraft and tuck in its wings, especially when their paths are head-on. This results in the bird falling initially until it spreads out its wings again and resumes flying.

When encountering a vulture, the safest way to avoid an impact is to slightly elevate the nose of the aircraft and try to gain altitude while being on the lookout for the other specimen in the pair, which could very well be nearby.

This evasive maneuver manages to protect the tail of the aircraft in an effort to avoid a potential impact with the tail that could damage it or even cause the rudder or an elevator to break and detach.

In this case, the reaction of the pilot, who was highly experienced, was carried out in this manner and no doubt prevented the impact, which was significant, from affecting the tail cone and causing irreparable damage and the loss of control of the aircraft.

The regulations involving the griffon vulture are generally aimed at protecting the species and normally do not consider any aspects related to aviation, except, as noted earlier, for the contents of CHAPTER V, Article 58, Section 1.d) of Organic Law 42/2007, which, as mentioned, lists as an exception to the prohibitions the need to prevent accidents involving aviation safety.

However, it seems that in no case have the contents of this article been taken into account, nor are the competent authorities in the area of environmental management, sustainability and the ecological transition aware of the problem involving aviation safety caused by the large populations of griffon vultures that inhabit areas with a significant amount of general and sports aviation.

Proof of this lies in Recommendation 05/2018, which was issued as part of accident investigation A-016/2017 to the Ministry for the Ecological Transition, which is responsible for environmental issues. Specifically, it was sent to the Subdirector General for Biodiversity and the Natural Environment to have it “endorse and coordinate actions with regional governments to minimize the excessive concentration and growth of griffon vulture (*Gyps fulvus*) colonies in any regions of Spain that are affected”, though this agency rejected the recommendation and ended up taking no action in this regard.

In its reply, the ministry expressed that the best option was to inform pilots about areas with the most risk, and about the times when this risk is greatest, in terms of those points with the highest bird concentrations. It also noted the importance of encouraging, and even requiring, aircraft to fly at altitudes in excess of 1000 m, since large soaring birds do not fly at that altitude.

The ministry was also informed that the CIAIAC was of the opinion that in neighboring countries where the population of griffon vultures is far lower, european law was not violated and yet the result is very different in terms of aviation safety.

No recommendation is issued to pilot associations, since efforts have already been made using various means to inform their members.

In fact, AESA published a flyer with recommendations to avoid bird strikes that was based on an AOPA operational safety letter. It also included information published in the AIP and recommendations presented by AEPAL and AOPA.

It also seems obvious that both AESA and ENAIRE are aware of the problem, since AESA published a flyer in 2017 with recommendations for avoiding bird strikes, and a brochure on bird strikes. It also established the National Aviation and Wildlife Program.

In the case of ENAIRE, and in response to a CIAIAC recommendation, it improved the Aeronautical Information Publication (AIP) by updating the information on the flights of migratory birds and areas with sensitive wildlife, and including three bird concentration charts with updated information on birds, including griffon vultures.

It does seem appropriate, however, to issue a new recommendation to the same Ministry for the Ecological Transition to have it organize a meeting with the regional governments in which to discuss and come to an understanding on Article 58, Section 1.d) of Organic Law 47/2007, such that aviation safety and accident prevention are given central roles in the exceptions that apply to the various prohibitions specified in articles 52 and 54 of the aforementioned law.

### **3. CONCLUSIONS**

#### **3.1. Findings**

- The Rollanden Schneider L3-17 glider took off from the aerodrome of Santa Cilia – LECI (Huesca) to go on a local flight.
- There was one occupant on board.
- He was conducting a mountain flight.
- The pilot had a valid license and medical certificate.
- The glider impacted a griffon vulture in the vicinity of Pico Bisaurin (Huesca) while at an approximate altitude of 2200 m.
- The impact caused significant damage to the left wing but it did not render the aircraft impossible to control.
- The pilot was uninjured and was able to return to the departure aerodrome and land normally.
- The population of griffon vultures has increased considerably in Spain in the last four decades.
- Regional governments are responsible for conserving the griffon vulture and they have set up a large network of feeding sites for necrophagous birds.
- The region of Aragon has 54 such feeding sites.

#### **3.2. Causes/Contributing factors**

The accident was caused by a bird strike, probably involving a griffon vulture, in an area containing many specimens of this species, which caused significant damage to the aircraft.

The evasive maneuver performed by the pilot upon seeing the first specimen—lifting the front of the aircraft to gain altitude and protect the tail cone—was correct.

A contributing factor is the extraordinary increase in the population of griffon vultures experienced in Spain in recent decades due to, among other reasons, the proliferation of areas made available in Spain's various regions as feeding sites for necrophagous birds.

#### **4. RECOMMENDATIONS**

REC. 25/2019. It is recommended that Ministry for the Ecological Transition and the Demographic Challenge, in order to prevent accidents involving aviation safety, apply the exceptions considered in Article 61.1.b) of Law 42/2007 of 13 December, on Natural Heritage and Biodiversity, to the griffon vulture (*Gyps fulvus*) population, thereby reversing the prohibitions laid out in Chapter I of said law.



## ANNEX

### INFORMATION ON THE GRIFFON VULTURE (*GYPS FULVUS*)<sup>6</sup>

The griffon vulture is a large, soaring bird of prey that scavenges during the day and generally inhabits mountain regions with deep valleys and thermal updrafts. The birds use these updrafts to reach altitudes ranging from 1800 to 3500 m, where they fly in circles in the direction dictated by the largest specimens.

Adults can reach a length of 96 to 110 cm, a wingspan of 250 to 280 cm and a weight of 4.5 to 7 kg.

The griffon vulture population in Spain has experienced significant growth in the last three decades, going from 3240 pairs in 1979 to a current population that is ten times larger.

In the specific case of the province of Huesca, the main colonies are located in the northwest of the province, on the mountains that flank the middle course of the Gallego River, on the border with the province of Zaragoza, very close to the three aerodromes that host most of the gliding activity, namely, Santa Cilia, Benabarre and Castejón de Sos.

The Spanish Ornithological Society (SEO) has been conducting counts of this species since 1979, and has completed five in total (1979, 1989, 1998, 2008 and 2018).



Figure 7. Distribution of the griffon vulture in Spain

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<sup>6</sup> The data contained in this section are taken from the publication *El buitre leonado en España* (The Griffon Vulture in Spain), by the Spanish Ornithological Society (SEO).

Based on these counts, it has been determined that Spain is home to 90% of all the specimens that are found in 19 European countries, according to the report published in 2018 by the SEO titled *El buitre leonado en España. Población reproductora en 2018 y método de censo (The Griffon Vulture in Spain. Breeding population in 2018 and Census Method)*.

This report estimates that there could be between 95930 and 122542 specimens. This calculation is based on the number of breeding pairs sighted, which ranges from 30946 to 37134.

Also identified were 2544 colonies or sites, and 533 pairs were located that were apparently breeding in isolation, meaning there were 3077 breeding sites through 2018.

They incubate on cliffsides called “buitreras” and both genders take part in building the nest, which is made of sticks, feathers and fur. The eggs are laid in late January. It takes 52 days to incubate the single egg, a task that is done by both parents over 24 or 48 hour shifts. The chick will leave the nest in July or August.

The region of Aragon had 563 colonies, 127 isolated pairs and 4832 pairs. These figures are 184, 41 and 1715 for the province of Huesca, respectively. As a result, Huesca ranks sixth in terms of the population numbers of this bird, with 5% of the total.

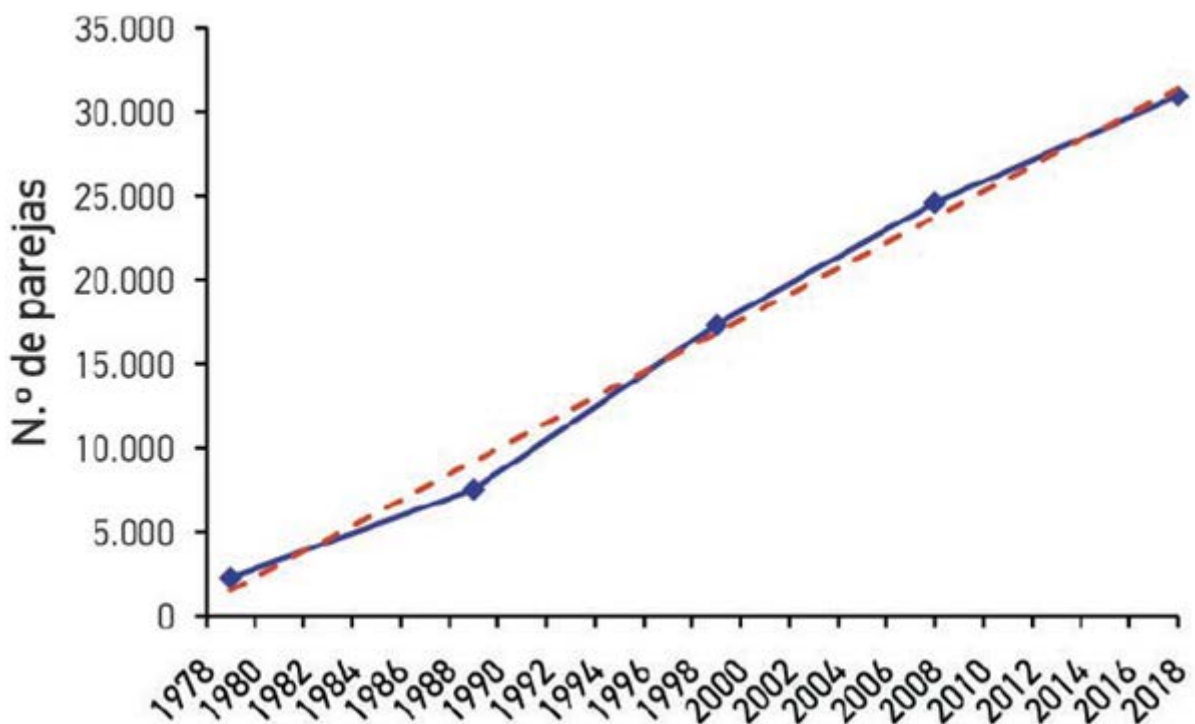


Figure 8. Trend in the griffon vulture population in Spain.

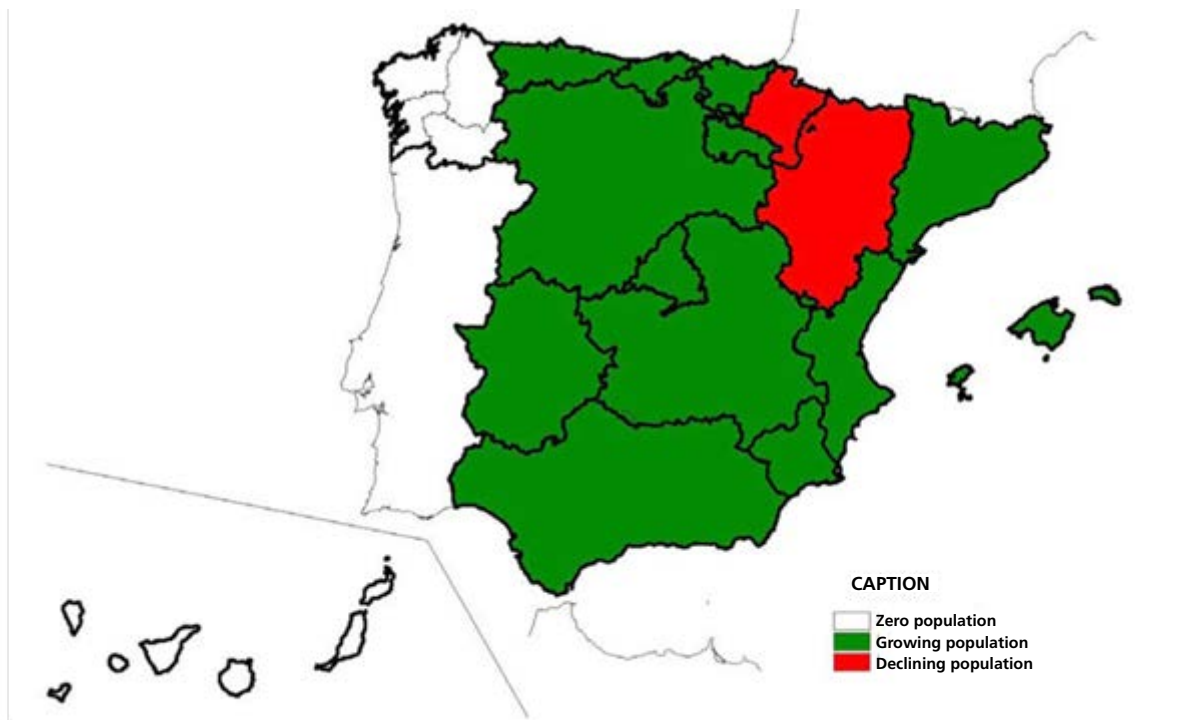


Figure 9. Population trend by region from 2008 to 2018

The griffon vulture population has obviously been on the rise, although the only two regions in which it is in decline are Aragon and Navarre, as the graphs above show.

The province of Huesca saw a large increase from 1990 to 2000, but the population has been gradually dropping ever since.

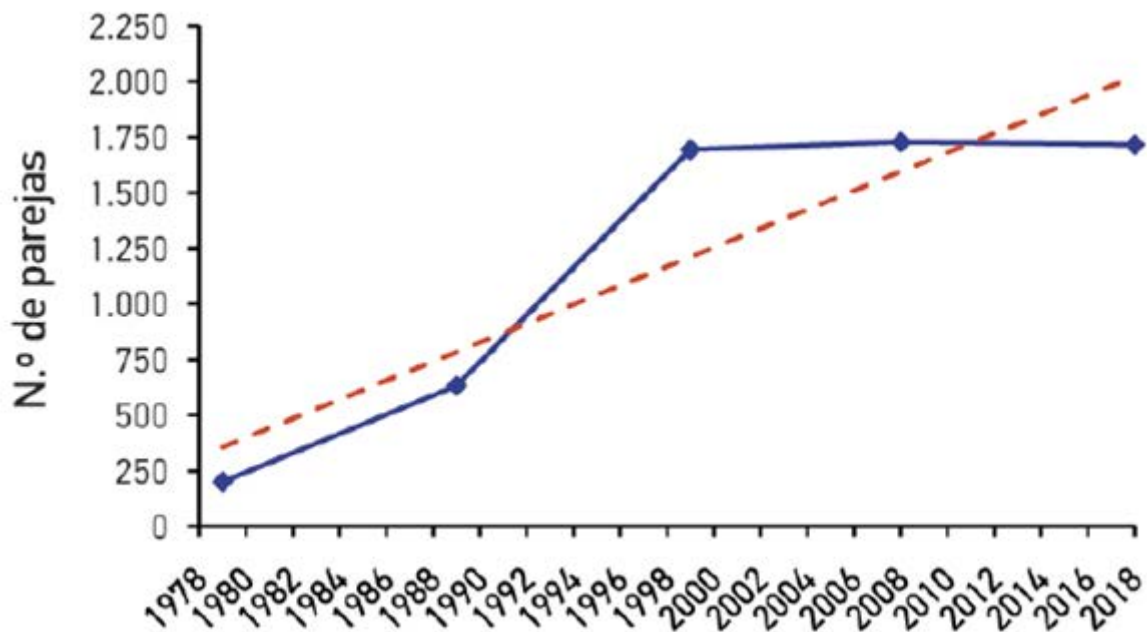


Figura 10. Evolución de la población de buitre leonado en Huesca

Section ENR 5.6-1 of ENAIRE's Aeronautical Information Publication (AIP) contains information on migratory birds and areas with sensitive wildlife, as well as on those areas that have breeding colonies of griffon vultures.

In the province of Huesca, there is a natural protected space between the mountain ranges of San Juan de la Peña and Círculo. This space is located southeast of the Santa Cilia aerodrome, and is bound by five sets of coordinates (42°32'10" N – 0° 44' 15" W; 42° 32' 10" N – 0° 41' 20" W; 42° 30' 0" N – 0° 41' 20" W; 42° 30' 0" N – 0° 44' 15" W; 42° 32' 10" N – 0° 44' 15" W), with the Earth's surface as its lower limit and flight level 5900 ft as its upper limit.

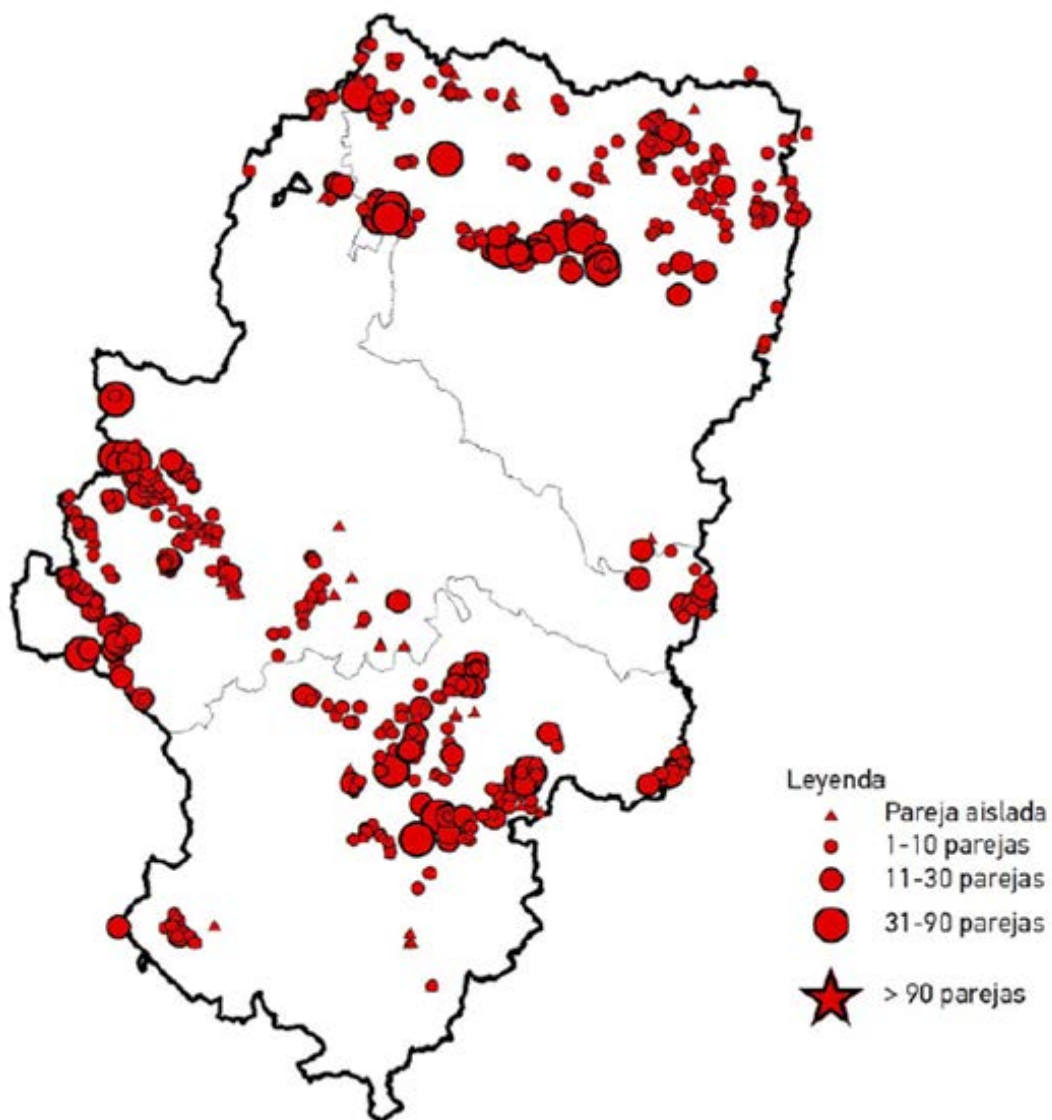


Figure 11. Distribution of the griffon vulture in Aragon in 2018



Figure 11. Information in the ENAIRE AIP

### **NETWORK OF FEEDING SITES FOR NECROPHAGOUS BIRDS IN ARAGON (RACAN)<sup>7</sup>**

It was the food crisis brought on by transmissible spongiform encephalopathies (TSEs), or mad-cow disease, that led Spain to implement strict regulations on the collection of animal by-products not intended for human consumption. This regulation altered the availability of food for necrophagous birds of prey.

Before the strict enforcement of this law, all of these species benefitted from plentiful food sources that originated in livestock holdings where existing laws, which already

<sup>7</sup> Information for this section was provided by the Department of Agriculture, Livestock and the Environment of the Government of Aragon.

prohibited dumping carcasses and animal remains in fields, were not enforced as scrupulously as they are now.

The foreseeable effect that limiting the disposal of animal remains in outdoor areas would have on the food available to necrophagous birds of prey led to the enactment in Spain of Royal Decree 1098/2002 of 25 October, which regulates the feeding of necrophagous birds of prey with certain dead animals and their by-products.

This decree was amended by Royal Decree 664/2007 of 25 May, which expressly expanded the set of products that could be used to feed scavenging birds, and relaxed some of the restrictions, effectively voiding the previous Royal Decree.

In the case of Aragon, Decree 207/2005 of 11 October, of the Government of Aragon and which regulates the authorization for installing and using sites to feed certain dead animals to necrophagous birds of prey and creates the network of feeding sites in Aragon, lays out the conditions and circumstances for setting up these feeding sites.

Subsequently, the Order of 13 March 2007 of the Department of Agriculture, Food and the Environment, which implements Decree 207/2005, allowed the possibility of using animal by-products of categories 2 and 3, not intended for human consumption (primarily slaughterhouse scraps), to feed these birds.

Subsequently, and in keeping with the amended national law, Decree 102/2009 of 26 May of the Government of Aragon was enacted. It regulated the authorization for installing and using sites to feed certain animal by-products not intended for human consumption to necrophagous birds of prey and expanded the network of feeding sites in Aragon. It also replaced the aforementioned Decree 207/2005.

The current Network of Feeding Sites for Necrophagous Birds in Aragon (RACAN) contains 54 facilities distributed throughout the three provinces (Figure 12).

The main species that uses the network is the griffon vulture. Not surprisingly, Aragon has some 5000 breeding pairs and probably around 20000 specimens of this species.

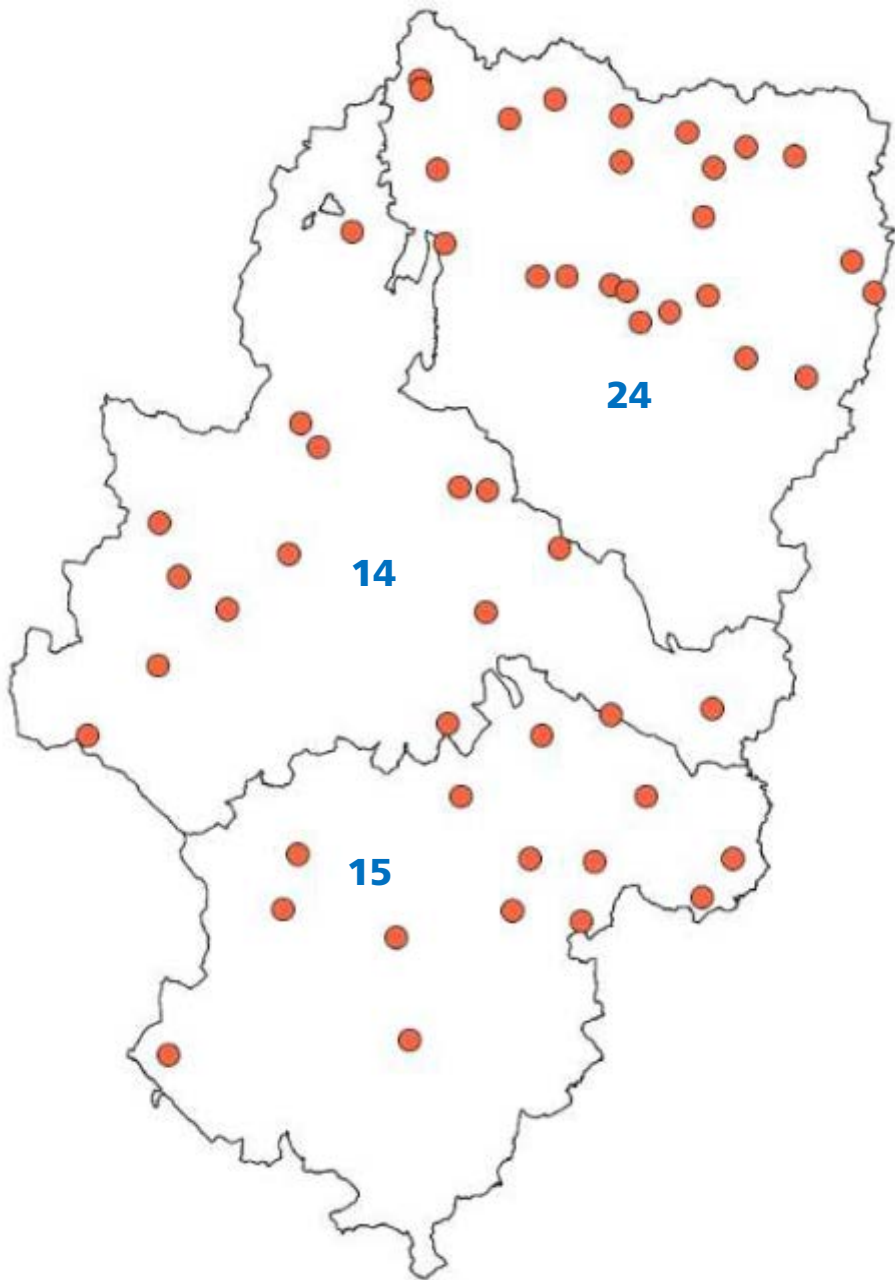


Figure 12. Locations of feeding sites for necrophagous birds in Aragon