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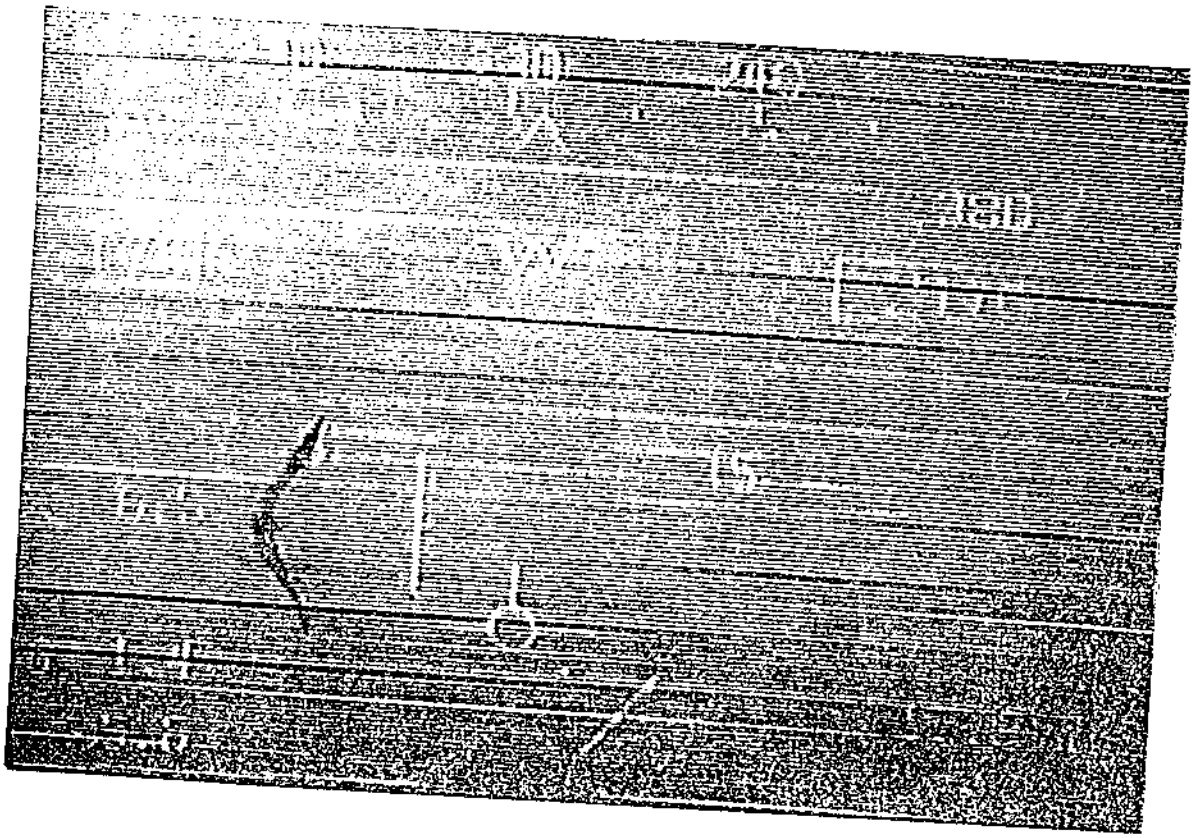
VULTURES IN SPAIN

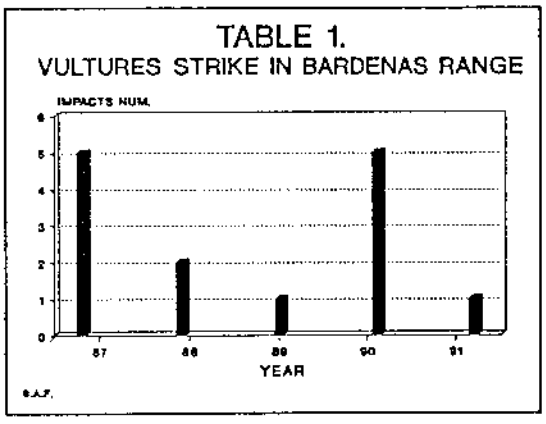


S.A.F.
cap. Jorge Clavero Mañueco
ZARAGOZA AIR BASE

The Spanish population of Griffon Vultures (Gyps fulvus) is 80% of the European population. About 25,000 are spread throughout several parts of Spain.

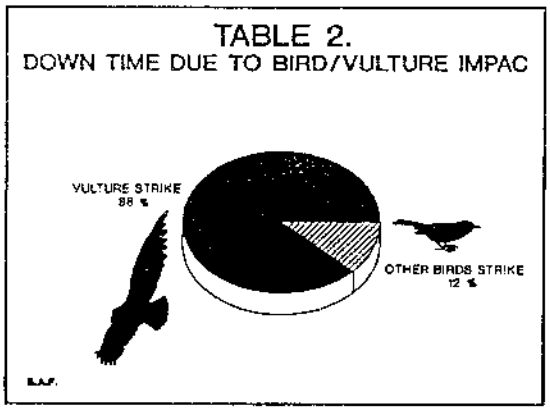
Characteristics of large size, heavy weight (8 Kg), long distance traveling and they fly in big flocks, make them a constant danger for Low Level Navigation.

Statistics support this affirmation. In the Bardenas Range -Navarra- the average of strikes by vultures per year is 2.8 . TABLE 1.



The importance of these accidents is greater if we consider that at this Range, three pilots have lost their lives, in recent years.

TABLE 2. SHOWS DOWN TIME DUE TO BIRD/VULTUR IMPACT



STATUS AND DISTRIBUTION.-

The II National Survey of the Griffon Vulture shows the increase of the population between 1979 and 1989 is estimated at 90%.

The distribution is very irregular. Absent in both plateaus, North-West mountains, Guadalquivir basin and East Coast. The highest densities are found in the Iberic Massif, central. and western Pirenees, eastern cantabric mountains, Sierra Betica and Mountains of Toledo.

FIG 1. The province with the highest population is Navarra, with 45 nesting colonies -about 2200 birds-.

The increase in population has occurred in the same colonies as 10 years ago, especially those which had more than 30 breeding

pairs.

This rapid population increase is attributed to less persecution, less poisoning and more abundant food resources

The number of breeding ranches has grown 20% in the last 10 years.

Poisoning is the main factor of mortality. The breeding rates have been studied in 53 colonies, including 1074 pairs. Breeding success is 0.76. Applying those results to the total population, we discover that each year 3500 new vultures will fly in Spain.....

But, what will limit the maximum population ? Probably not enough food resources will be the first cause to stop the number of growing birds. Isolated colonies in the Adriatic islands show us the relation between vultures and number of animals from which it feeds (goats, sheeps, etc) is 1/583. In Spain it is lower; 1/871. This means vultures will increase 32% more, reaching a total number of 30.000 birds, to many vultures to fly safely in those areas.

ACTIVITY.-

Altitude of Flight over ground: Becasue of the body weight of about 8 Kg the Gyps F. they prefer to soar when flying. Therefore, they are dependant on thermal upcurrents or anabatic wind near cliffs, hills or mountains. Normally, anabatic winds

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extend 0-500 meters over the top of a barrier. Vultures fly with thermal upcurrents, which take them up untill they reach the cloudbase. This depends on the altitude of the condensation level, which fixes the cloud base.

Flying Activity: The time of activity in the morning will be about 1-3 hours after sunrise. Even in Stratus clouds and fog there might be good thermals because of unstable conditions. Reduced flying activity is in early morning and in late evening (In summer they might fly till 22:00 hrs) The general pattern looks like this: Vultures take off about 07:00 - 11:00 in the morning, return about 12:00 - 15:00 in the midday, take off again and return around 17:00 - 22:00 in the evening. The seasonal effects, which influence activity patterns correlate with the lengh of day light.

Greater flying activity in correlation with wind velocity: With wind velocities of 55-60 km vultures don't usually leave their colony. But, the motivation to fly will depend on the need to search for food.

Foraging Areas: They do not have special corridors in which to fly, and they don't have a defined home range area. They do not fly only in one direction. They extend over a large area and maintain visual contact with neighbouring flying vultures. The flying radius is about 25 km during the reproductive period till the young vultures learn to fly. For vultures without chicks the radius might be about 50 km.

Another reason to fly in one direction, is to change the habitat area from summer to winter. In winter time the areas of the northern colonies are covered with snow. This makes adult,

sub-adult and juveniles move to more southern districts without snow. The oriented flight takes place when some of the young vultures fly SSW to regions in south Spain. The displacement takes place in October - November. This is the period when there are more vultures in the area of Zaragoza.

Soaring parameterss:

Glide angle ratio	15:1
Flying speed when cross country	50-65 km/h
Slow search flying	15 km/h
Fast flying	100-150 km/h

SOLUTIONS.-

First of all, it would be wonderfull to maintain a fixed number of birds, but this would be very difficult to do in a society more sensitive to Ecological concerns than Defense affairs.

To study, and to mark off each colony activity area. We could limit the range of the vultures by placing dead animals (carcasses) nearer the colonies.

Apply The Spanish Epizootias Law -1953- which states that everybody should burry their own dead animals.

Don't fly in active vulture areas. Establish a Danger Color Code, for areas, corridors, airfields, ranges etc, where vulture presence is frequent.

AVOID.-

To avoid collision it would be "better" to fly before 07:00 in the morning or after 21:00 in the evening and not during the times, when there are activity peaks of the vultures. There will be limited Vulture activity during thunderstorms, when there is no thermal upcurrent and adiabatic upcurrent or if there is very strong wind. Also it is unlikely that there are vultures flying over snowy areas in wintertime.

Controlers and/or pilots information will establish the Color Code.

Example:

ORANGE.....birds presence.....Danger
RED.....moderate density.....High Danger
BLACK.....high density..... .....Closed to Traffic

It is difficult to improve aeroplanes against vulture strikes.
There are no airplane materials strong enough to support an impact of 8 Kgrm. at 500 kts.

Pilots have to watch for vultures flying in thermal columns and in places with anabatic winds. If impossible to avoid danger areas, pass through it perpendicularly. When the pilot observes there are Vultures he should follow the following procedures:

-If there is enough time to react.

*Pull up immediately
*Inform other pilots (controler) in the vecintiy
*Leave that area immediately.

-If there is not enough time or critical flight conditions.

*Do not react, just protect the face.

SUMMARY.-

Vultures density in Spain represent a big problem to Low Level Flying

Vulture strikes represent 88% of aircrafts maintenance recovery time and 95% of aircraft damage.

To decrease these bird strikes it would be necessary to mark off as much as possible the bird activity areas. Paint a precise map of those areas and don't overfly them in daylight hours at low level.

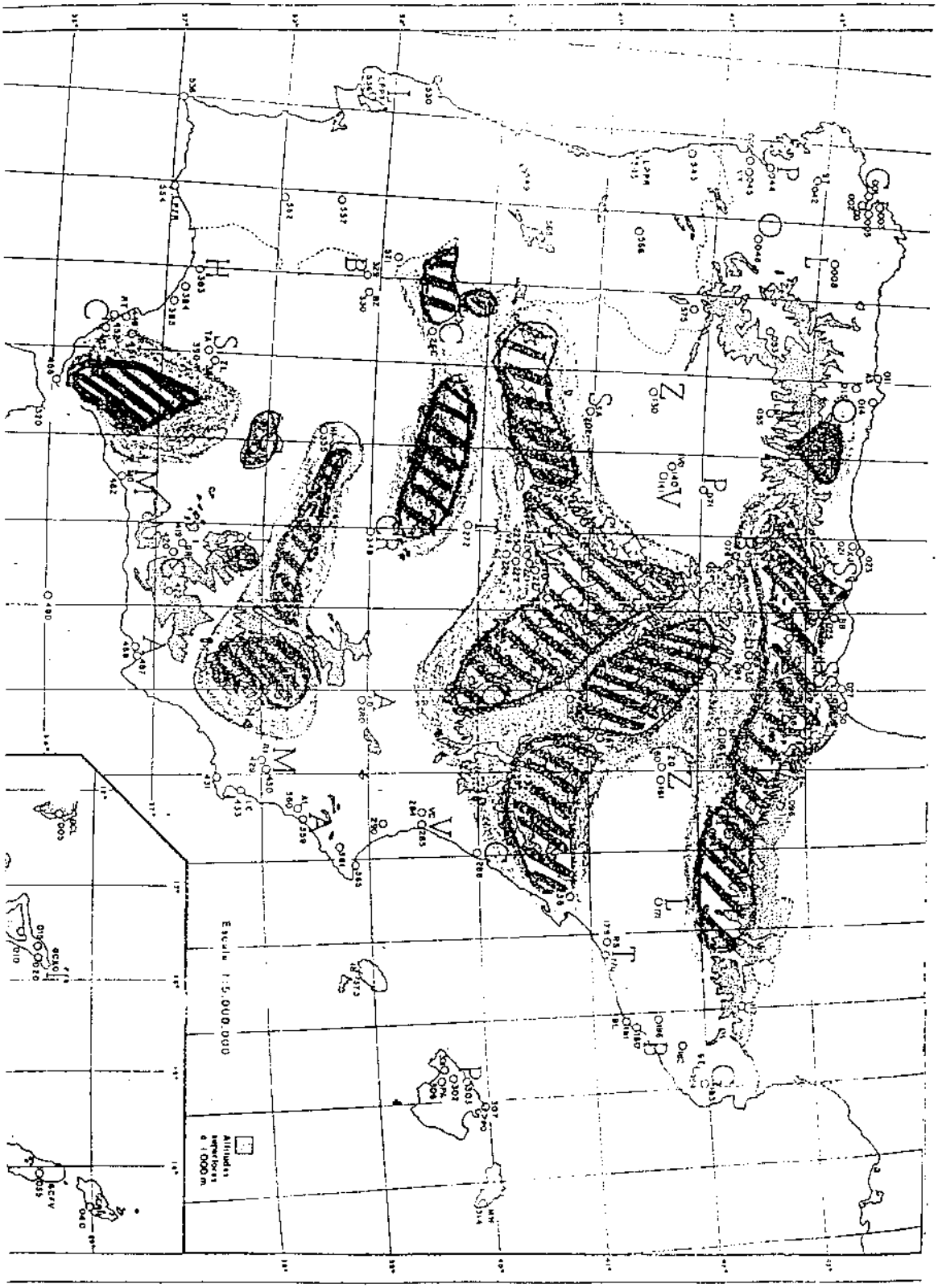
Use a Birds Danger Color Code.

Apply pilots bird strike procedures, and inform other pilots/controlers in the area.

In a word avoid coinciding in the same space/hour

with the Vultures.

ZARAGOZA AIR BASE MARCH 1992.



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