

Collisions of aircrafts with birds of prey in the Alps

by Bruno Bruderer, Switzerland

Thermals above the plains in the valleys, updrafts along the sunward or windward slope of mountain ridges as well as lee waves offer a variety of climbing possibilities for glider pilots and birds of prey. Glider pilots know that birds of prey soaring in updrafts show usually a pronounced indifference against gliders. Even a large raptor as the Golden Eagle seems to prefer symbolic attacks and flight display instead of real fights. Even individuals of the same species penetrating into the territory of an eagle may pass unattacked if they don't come too close to the eyrie or to a sexually active pair in flight.

Huth (1968, Orn. Beob. 65: 131) gives an example of an incidental collision between a glider and an eagle, fortunately without damage to the plane. It shows that glider pilots have to be aware of the possibility that eagles may alter the direction of circling or the altitude more rapidly than a glider. Pilots of faster aircrafts have to bear in mind that all the different updraft situations in mountain areas are a potential hazard with respect to incidental collisions with birds of prey.

Some recent reports suggest that besides the incidental collisions, large birds of prey may, under certain circumstances, actively attack an aircraft (see below). If this holds true, even a relatively small population of large raptors (e.g. about 100 to 120 breeding pairs of the Golden Eagle in the Swiss Alps) may be a certain risk. By comparison of the known cases we will try to find out under which circumstances attacks occur and how they might be avoided.

Attacks of Golden Eagles to aircrafts

- 1.) 6 March 1962, C-36 above the Rhone Valley (western Swiss Alps) 1800 m ASL (800 m AGL): A pair of Golden Eagles circling slightly above approach level of aircraft. Suddenly one of the Eagles turns towards the aircraft and hits the cockpit in a dive attack.
- 2.) 12 April 1975, Helicopter Hughes 269 C above the Albula Valley (eastern Swiss Alps) 1700 m (150 m AGL): At the same flight level a pair of Golden Eagles in flight shows the display typical for the maiting season. The Pilot tries to fly around the pair; at a distance of 30-50 m one of the Eagles turns towards the helicopter, strikes the cabine, and is thrown back to the main rotor. The female eagle was killed, the helicopter could

land in spite of the damaged rotor (cf. Bruderer 1976, Orn. Beob. 73, 29-30).

- 3.) Report by P. Vaysse in "Aéroclub et le Pilot Privé" 42, June 1977, p. 47-48, region of Aspres (French Alps, Dauphiné), 2000 m ASL (200 m AGL) no date indicated: An eagle approaches a number of gliders and shows towards five of them a flight behaviour remembering sexual display: He appears above the left wing, dives in front of the plane's nose, re-appears at the left wingtip and flies along the wing towards the fuselage, Following the last approach the Eagle moves on to the back of the glider, tries to clutch at the fuselage, glides backwards and damages part of the empennage.
- 4.) February 1978, a "Libelle" glider at 1700 m ASL above the western Italian Alps: An Eagle (described as a three-year-old male of 11 lb. According to the photograph to be identified as younger than 3 years, and according to the given weight of 5 kg to be determined as a female, since males are not heavier than 4,4 kg) dived, wings folded at the plane and bursted through the canopy. (Flight International, March 1978, p. 687)
- 5.) Described by Gordon (The Golden Eagle, London 1955): It was in deep winter, when in the Scottish Highlands a stag stampeded on seeing an aircraft flying over. The pilot and a pair of Golden Eagles observed the stag getting stuck in a deep drift. The eagles "considered the plane as a rival and attacked it with power dives". (In my opinion the stag in the deep snow was rather coincidence than the cause of the eagles' attacks).
- 6.) Described by Gordon (l.c.): On a mission of shooting eagles by plain (!) in Texas a small piston aircraft flew directly towards an eagle from a slightly lower level than the bird. The eagle dived and bursted through the cockpit. (This case is not directly comparable to the others).

The common features of the five comparable cases are:

- where the date is known, it is in early spring, i.e. in the maiting season (cases 1, 2, 4 and possibly also 5)
- in the cases 1, 2 and 5 pairs of eagles were engaged. In one of them an excellent description of the behaviour of the pair prior to the attack is available, which shows clearly that the pair was sexually displaying. The single bird in case 3 shows flight manoeuvres remembering flight display. Case 4 seems to be a young bird (roaming around on search of a territory) which always has to be ready to escape or to fight when coming too close to a territorial pair.

- in all cases the bird was prior to the attack at the same or a slightly higher level than the aircraft.
- in no case is there a hint to the immediate proximity of the eyrie.
- in 4 out of 5 cases of real and successful attacks (1, 2, 4, 6) the cockpit was attacked.

Comparison with other species and intraspecific fights

Two attacks of Common Buzzards got to my knowledge (a careful search would certainly bring up more); their similarity to the eagle attacks is striking:

- 1) 24.7.76, glider TCV o2 in the region of Aspres (French Alps) 1600 m ASL (800 m AGL): A pair of Common Buzzards in the same thermals. Suddenly the plain gets a good push of thermal lift, and - did the birds feel threatened? - one of them turned back, flew a frontal attack towards the cockpit and crashed at the plane's wing, 70 cm to the right of the cockpit. (Vaysse l.c.)
- 2) 27.5.71 region of Biasca (southern Swiss Alps): A Common Buzzard glides in a flight behaviour as in sexual display along a rock face and dives several times with closed wings in at least symbolic attacks towards an aircraft flying very close to the ground (A. Schifferli and P. d'Alessandri, pers. comm.)

Three out of four intraspecific fights of Golden Eagles reported by Gordon (l.c.) were observed in spring, the fourth in July (after the fledging of the young). Three intraspecific fights in the Swiss Alps had been reported from spring, two from autumn (after the young had become independent). (Müller 1975, Sutter 1975, Orn. Beob. 72, 115-117).

Glutz, Bauer and Bezzel (in Handbuch der Vögel Mitteleuropas, Frankfurt 1971) state that apart from these heavy struggles a somewhat increased aggressiveness may occur in the vicinity of the nest.

Conclusions

1. In spite of the pronounced indifference of soaring eagles towards aircrafts, glider pilots should allow for rapid directional or altitudinal changes in the flight of eagles. Pilots of faster aircrafts should take into account that mountains with different updrafts are preferred areas of soaring raptors.
2. Attacks of eagles seem to occur when an aircraft approaches a sexually displaying pair (undulating flights: changing phases of upward spirals, diving and gliding) especially when the aircraft is at the same or a slightly lower level.

Flight display may occur in every season, most pronounced from January to

May, somewhat less after fledging of the young and in autumn when the young become independent. It is as frequent at the edge of the territory as in the vicinity of the nest.

3. Attacks by eagles might also be provoked when an aircraft comes into a critical distance from a bird (in the order of 100 m ?), especially if the aircraft flies from a lower level directly towards the eagle or performs a rapide change in altitude.
4. The pilot should keep in mind that intraspecific fights also occur in the vicinity of the nest. Most of the nesting sites are at heights of 1000 to 2000 m ASL (lower than the preferred hunting area), in the slope of large valleys or the exit of small valleys, usually in the upper part of steep rocky walls with free approach.

As a general rule for the pilots one could say: "Fly higher than the eagles!"

Acknowledgments

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