

# Establishment of a feeding station near the Laterza LIPU Reserve to provide additional food for three declining necrophagous raptor species in Apulia, Italy

Marco Gustin\*, Vittorio Giacoia & Filippo Bellini

Conservation Department LIPU-Birdlife Italia, Via Trento 49, 43100 Parma, Italy

\*Corresponding author e-mail: [marco.gustin@lipu.it](mailto:marco.gustin@lipu.it)

## SUMMARY

From February 2004 to September 2007, a raptor feeding station was operational near the Laterza LIPU Reserve (Taranto Province, southern Italy). The feeding station measured 40 x 40 m and was enclosed by a 1.8 m high wire mesh fence to prevent large mammal access. An average of 50 sheep carcasses were supplied at the feeding station each year. Over 2,200 hours of observation at the feeding station were made, averaging about 550 hours per year. During observation periods, black kite *Milvus migrans* numbers recorded at the feeding station ranged from a minimum of five (in 2004) to a maximum of 53 (2006) annually; red kite *Milvus milvus* numbers ranged between one (2004) to 23 (in both 2006 and 2007). Only one Egyptian vulture *Neophron percnopterus* (in 2007) was observed at the feeding station. Provision of supplemental food at the feeding station may represent one factor explaining the establishment of a few breeding pairs of red kites and black kites, and increasing numbers of raptors recorded in the study area.

## BACKGROUND

In Italy, direct persecution and indiscriminate use of poison to eliminate predators (such as red foxes *Vulpes vulpes*, feral dogs *Canis familiaris* and feral cats *Felis catus*) of game animals, habitat loss, changes in agro-silvo-pastoral practices, wind farms and power lines are considered the main factors driving the decline of many vertebrate predator species. In particular necrophagous (scavenging) raptors such as black kite *Milvus migrans*, red kite *Milvus milvus* and Egyptian vulture *Neophron percnopterus* have suffered (Sigismondi *et al.* 2007, Sigismondi 2008).

Within the Apulia region of southern Italy (the wider area of this present study) red kites are in strong decline (7-12 breeding pairs in 1985-1990 declining to 2-4 pairs in 2007) and are now considered critically endangered at the Apulia regional level (Sigismondi 2008). In the area of this present study, Gravina di Laterza (Taranto province), no breeding pairs had been recorded in recent years.

Black kites have also undergone a significant decline in Apulia, from 24-31 breeding pairs in the 1970s and 1980s to 5-9 pairs currently,

probably in part due to the proliferation of wind farms and associated collision mortality (Sigismondi *et al.* 2007) and is considered endangered at the regional level (Sigismondi 2008). In the study area the species was only recorded as an irregular breeder prior to provision of the feeding station.

Mirroring declines at the national level (Liberatori & Penteriani 2001), Egyptian vultures declined from 7-10 pairs in the 1960s to the current 0-1 pairs, and is considered critically endangered at the Apulia regional level (Sigismondi 2008). In the study area the species bred in small numbers up to 2003 (Giacoia & Bellini 2008).

In the last few years, supplemental feeding of vultures and other necrophagous birds has been increasingly used in Europe (especially in the Mediterranean region) in an attempt to support dwindling raptor populations threatened by declining food resources (Terrasse 1985, Terrasse *et al.* 1994, Sarrazin *et al.* 1995, Meretsky & Mannan 1999, Oro *et al.* 2008) and the provision of supplementary food at feeding stations is now a well-established management tool for conserving populations of scavengers in many regions of the world. In Italy, feeding

stations are being used in griffon vulture *Gyps fulvus* restocking and reintroduction programmes (Allavena 2004), and to provide a supplemental food source for wintering black and red kites in the Tolfa hills of central Italy (Catullo *et al.* 1994).

This paper presents the results of observations of feeding station use near the Gravina di Laterza (LIPU Reserve) in Taranto Province (Apulia) by necrophagous birds, the three main species of interest being Egyptian vulture, red kite and black kite. The methodology follows the lines of studies conducted elsewhere in Europe of griffon vultures (Donazar & Ceballos 1988, Garcia-Ripollés *et al.* 2004).

## ACTION

**Study area:** The feeding station was established on a plateau (320 m a.s.l.) near the Gravina di Laterza (LIPU Reserve) in the “Area delle Gravine” Specially Protected Area (SPA) in Taranto Province, as part of the project: “Action plan for the conservation of the Egyptian vulture and conservation actions for lesser kestrel, black kite, and red kite in the SPA-SCI Area delle Gravine, POR Apulia 2000-2006”. The study area comprises mainly sheep-grazed meadows and pseudo-steppe habitat.

**Establishment and provisioning of the feeding station:** The feeding station was operational from February 2004 to September 2007. It was installed in an area that was easily accessible and could be monitored from an adequate distance (so as not to disturb any visiting raptors). Observations were made with a spotting telescope (30 x 60) from a distance of about 300 m. Only birds observed actually feeding on carrion inside the fence were considered as ‘visitors’ to the feeding station (following Anderson & Horwitz 1978, Hiraldo *et al.* 1991); birds which did not feed or were only seen flying over were excluded from counts. We also recorded the length of time during which each carcass ‘remained’ at the feeding station, i.e. until it was either consumed or had decomposed beyond edibility to raptors. A carcass was considered consumed when it had lost more than 70% of its total muscle mass. It was considered decomposed beyond edibility when it had suffered biodegradation, e.g. by insect larvae and other small detritivorous invertebrates.

The feeding station measured 40 x 40 m and was enclosed by a 1.8 m high wire mesh fence in order to prevent large mammals (e.g. foxes, wild boar *Sus scrofa* and feral dogs) from

accessing it. The feeding station was replenished weekly (with sheep carcasses) between February and September each year (2004-2007). From October to January, carcasses were not supplied due to the absence of Egyptian vultures and black kites (wintering in Africa), while red kites are only sporadically present. The sheep carcasses were locally obtained (originating within a 5-7 km radius of the feeding station) and brought to the station in a four-wheel drive vehicle, adhering to the health and hygiene procedures set out in regulation EC n.1774/2002. An average of 50 sheep carcasses were brought to the feeding station each year (a total of about 200 carcasses during the entire 4-year study period).

**Monitoring:** A small team of experienced observers conducted 2,227 hours of observation at the feeding station over four years (2004-2007), averaging 557 hours each year (range: 322-773 h).

## CONSEQUENCES

Due to a combination of vigilance and monitoring efforts, direct or indirect human disturbance, as well as persecution attempts on the birds at the feeding station were prevented.

**Frequency of bird species using the feeding station:** The number of individuals of black kite, red kite and Egyptian vulture observed at the feeding station each year and the number of individuals per number of observation hours in 2004-2007, are summarised in Table 1. Black kite numbers using the feeding station annually, ranged from a minimum of five (2004) to a maximum of 53 (2006). Red kite numbers ranged from one (2004) to 23 (in both 2006 and 2007). Egyptian vulture was only seen once at the feeding station (a single individual on 3 July 2007). Feeding station use by black and red kites was highest between April and July, peaking in May for both species (Table 2). One other raptor species, common buzzard *Buteo buteo* (4 individuals) was also observed using the feeding station.

The most abundant raptor using the feeding station over the course of the four years was black kite (57.1 % of total observations).

Additional non-raptor bird species also observed during 2004-2007 study period utilising the feeding station: magpie *Pica pica* (a total of 4,449 individual observations), hooded crow *Corvus cornix* (151) and raven *Corvus corax* (123).

**Table 1.** The number of feeding station visits by black kite, red kite and Egyptian vulture each year, and number of individuals observed per observation hour, February 2004- September 2007.

| Species                     | 2004            |                      | 2005            |                      | 2006            |                      | 2007            |                      | Total           |
|-----------------------------|-----------------|----------------------|-----------------|----------------------|-----------------|----------------------|-----------------|----------------------|-----------------|
|                             | Number observed | Number ind/hour obs. | Number observed |
| Black kite                  | 5               | 0.01                 | 11              | 0.03                 | 53              | 0.08                 | 19              | 0.02                 | 88              |
| Red kite                    | 1               | 0.2                  | 14              | 0.04                 | 23              | 0.04                 | 23              | 0.03                 | 61              |
| Egyptian vulture            | 0               | 0                    | 0               | 0                    | 0               | 0                    | 1               | 0.001                | 1               |
| <b>Total</b>                | 6               |                      | 25              |                      | 76              |                      | 40              |                      | 147             |
| <b>Hours of observation</b> | 515             |                      | 322             |                      | 617             |                      | 773             |                      | 2,227           |

**Table 2.** Feeding station use by month of black and red kites, February 2004- September 2007.

| Species    | Feb | March | April | May | June | July | August | Sept | Total |
|------------|-----|-------|-------|-----|------|------|--------|------|-------|
| Black kite | 0   | 0     | 18    | 35  | 17   | 11   | 7      | 0    | 88    |
| Red kite   | 0   | 1     | 11    | 21  | 16   | 8    | 1      | 3    | 61    |

**Breeding observations:** In the study area, no breeding red kites were recorded in the period 2004-2006; three breeding pairs were recorded in 2007 (Marrese 2008a).

Three breeding pairs of black kite were observed in each of the years 2005-2007 (Marrese 2008b). Prior to this, the species was only an irregular breeder.

Egyptian vultures bred in small numbers up to 2003; during 2004-2007 only 2-3 non-breeding adults were observed.

**Conclusions:** We conclude that the supplementary feeding station at Gravina di Laterza was successful in that i) the number of two of the primary target species, black kite and red kite, using the feeding station broadly increased over time; and perhaps more importantly, ii) small increases in breeding attempts of these two species were recorded.

Although occasional Egyptian vultures were seen flying low over the feeding station showing obvious interest, only a single bird was observed feeding inside the feeding station on one occasion (July 2007). The low use of the feeding station by Egyptian vultures may have been due to the small size and enclosed nature of the station discouraging visitation, and the species' generally timid behaviour at this locality.

**Discussion:** The presence of a steady, constant food source at the feeding station is considered

probably responsible for the increased frequency of occurrence of all three primary target necrophagous species in the SPA. The presence of food sources also makes it more likely that migrating or over-summering individuals might linger in the area, leading to a reduction in food-related wanderings and reducing the risk of poisoning from visiting landfills or other uncontrolled sites.

Feeding stations have been used to facilitate recolonization by scavenging raptors of previously abandoned breeding areas (Mundy *et al.* 1992). Our research shows that the presence of the feeding station established at Gravina di Laterza could represent a factor explaining the breeding population increases (albeit small), in particular of red kites, observed in our study area. In Spain, several studies have shown that increased availability of food positively influences the reproductive parameters of scavengers nesting close to supplemental feeding sites (Donazar & Ceballos 1987, Donazar & Ceballos 1988, Sarrazin *et al.* 1995, Fernandez *et al.* 1996). Thus, the supplementary feeding scheme started in 2004, could have helped increase the local breeding population of red kites; currently 2-3 pairs breeding, versus none at the beginning of the project (Marrese 2008b), and black kites; one pair in each year 2005-2007, when previously only recorded as a sporadic breeder (Marrese 2008a).

Although more longer-term data is needed before any robust conclusions on the observed population growth of breeding red and black

kites in study area can be made, our preliminary results suggest that the feeding station is benefitting these raptors.

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