

# DECLINE OF THE LESSER KESTREL (*FALCO NAUMANNI*) IN GIBRALTAR: POSSIBLE CAUSES, CONSERVATION AND ACTION PLAN

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## ABSTRACT

The lesser kestrel (*Falco naumanni*), an endangered bird, breeds on the cliffs of the Rock of Gibraltar, at North Front. As elsewhere throughout its range, this species has shown a considerable decline at Gibraltar throughout the twentieth century. We discuss probable reasons for this decline. We also discuss possible conservation measures and outline an action plan for the conservation of the lesser kestrel in Gibraltar.

**Keywords:** Lesser kestrel, *Falco naumanni*, Gibraltar, Decline, Conservation, Action Plan.

## RESUMEN

El cernícalo primilla (*Falco naumanni*), un ave amenazada, anida en los acantilados de la cara norte del peñón de Gibraltar. Como en otras partes, esta especie conoció un considerable descenso en su población a lo largo del siglo XX. Consideramos las posibles causas de estos cambios en población así como posibles medidas de conservación y desarrollamos un plan de acción para conservar la especie en Gibraltar.

## INTRODUCTION

The lesser kestrel (*Falco naumanni*) is a migratory falcon that breeds across the Palearctic, from Portugal to Manchuria in China, mainly between latitudes of 30°-55° (Cramp *et al.* 1980; Hollom *et al.* 1988; Tucker & Heath 1994). The species winters across almost the whole of sub-Saharan Africa, avoiding only the west African rainforests and the deserts of the horn of Africa in the north-east of the continent. However, most individuals winter in southern Africa, from Zimbabwe to South Africa (Cade 1982; Tucker & Heath 1994). In addition, some of the populations of southern Iberia and north Africa are sedentary (Cramp *et al.* 1980). The lesser kestrel is a globally threatened species (Heredia *et al.* 1996; BirdLife International 2000; Liven-Schulman *et al.* 2004) which is classified as Vulnerable by BirdLife International (Collar *et al.* 1994; Tucker & Heath 1994; BirdLife International/European Bird Census Council 2000).

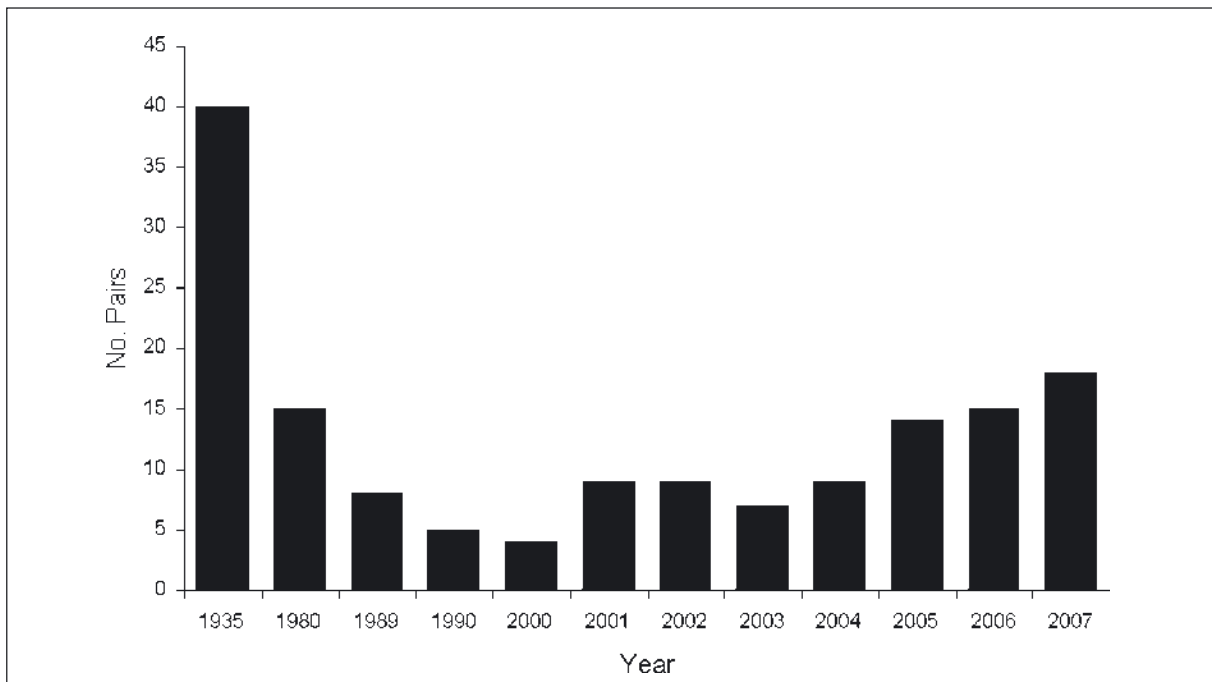
Tucker & Heath (1994) cite factors such as food-loss due to agricultural intensification, pesticides, loss of foraging habitats and loss of nest-sites as important factors that have led to the species' decrease. Liven-Schulman *et al.* (2004) recently suggested that, in Israel, the main causes of reduction in lesser kestrel numbers are increased distance between breeding and hunting sites, and the use of pesticides in city parks and lawns. Parks and lawns cannot perhaps be considered to form an important global component of lesser kestrel foraging ground, but since pesticides are also applied readily to agricultural areas this factor must still be considered important.

The Iberian peninsula is of particular importance to the lesser kestrel's European status in that, with between 5,167-8,210 pairs (BirdLife International/European Bird Census Council 2000), 44%-45% of European lesser kestrels breed in Iberia. Gibraltar's lesser kestrel colony forms a very tiny component of that proportion; only five to ten pairs were given as breeding on the Rock in 2000 (BirdLife International/European Bird Census Council 2000). The lesser kestrel has shown a large decline in Gibraltar, which has mirrored that witnessed all over the species' range. The species is protected by law in Gibraltar under schedule 1 of the 'Nature Protection Act, 1991' (L/N 11 of 1991). This paper discusses probable reasons for the decline of the species of the Rock. We also outline possible conservation measures and recommend an action plan for the conservation of the lesser kestrel in Gibraltar which complements that proposed by Perez (2006).

## METHODS & RESULTS

Data on population size has been gathered using older historical records (Rait-Kerr 1935; Cortés *et al.* 1980) and more recent data taken from GONHS Bird Reports (Holliday 1995; Garcia 2001-2005) or GONHS records. In addition, Reid (1873) recorded that 'the Lesser Kestrel breeds in numbers on the Rock, especially at the North Front...'. Similarly, Irby (1895) recorded 'vast numbers' breeding on the north face of the Rock, although he does not specify the exact number of pairs. It is interesting to note that, in addition to breeding records, Cortés *et al.* (1980) mention that at the time that their work was published, some birds stayed to winter on the Rock, with numbers occasionally reaching 50 individuals. This is certainly no longer the case. Figure 1 summarises the number of pairs of lesser kestrel breeding at Gibraltar from 1935 to the present. The number of breeding pairs at Gibraltar seems to have increased somewhat recently, although this apparent increase could possibly be the result of more intensive surveying.

The increase in size of the town of La Linea de la Concepción in neighbouring Spain has certainly resulted in loss of foraging habitat for Gibraltar's lesser kestrels. These birds could, until about 15 years ago, be seen hunting at the Neutral Ground on a frequent basis (shown in figure 2). However, this area of open, lightly grazed ground became gradually smaller until it disappeared altogether a few years ago. This has forced Gibraltar's lesser kestrels to forage beyond the northern limit of La Linea, an increasingly urbanised area. This means that distance between the colony and its foraging grounds has



**Figure 1.** Number of pairs of lesser kestrel breeding at Gibraltar from 1935 to the present. The apparent increase in recent years could be the product of more intensive sampling.

grown from 1-2km after the creation of the runway on the isthmus to over 5km at present. All of Gibraltar's lesser kestrels are now forced to hunt on the slopes of the Sierra Carbonera behind La Linea de la Concepción, and further north behind La Alcaidesa (*pers. obs.*; figure 2). Although much of Sierra Carbonera is property of the Spanish military, rapid urban development is taking place on the lower eastern slopes of the sierra, around the area known as Santa Margarita. Likewise, the area of La Alcaidesa is likely to be threatened by development eventually. This places a new pressure on the lesser kestrels' foraging ground.

## DISCUSSION

### Causes of Decline

Liven-Schulman *et al.* (2004) highlight increased distance between feeding grounds and nest-sites as a cause of decline in lesser kestrel populations. This is most likely to have impacted lesser kestrels breeding at Gibraltar. One further aspect is the possible impact that feral pigeons (*Columba livia domest.*) may have on lesser kestrel colonies. These have now taken some of the nest-sites at North Front that were formally occupied by pairs of lesser kestrels. The medieval castle that encapsulates Vieja Castellar harbours an until-recently thriving colony of lesser kestrels on its walls. The feeding grounds of this colony lie in the immediate vicinity of the colony, so that increased foraging distance from the colony cannot be regarded as a threat. Furthermore, the area in which these birds forage is composed of wild, grassy areas and *Cistus matorral*, an area in which no pesticides are applied. However, a reduction in breeding pairs has recently occurred at this site, and this has coincided with an increase in nesting feral pigeons (*pers. obs.*), apparently introduced at the site a few years ago. Aggression towards lesser kestrels from feral pigeons has been reported from this site (P. Acolina, *pers. comm.*).

### **Conservation**

The removal of feral pigeons from sites in and around North Front is highly desirable if we are to maximise the number of potential nest holes for lesser kestrels. Tucker & Heath (1994) comment that the conservation of foraging habitat around existing colonies must receive the highest priority and that careful land-use planning should ensure the avoidance of building developments in such areas. It is acknowledged that most of Gibraltar's lesser kestrel's traditional foraging grounds have already been destroyed through urbanisation, and that in any case practically all of this land was/is on Spanish soil and therefore out of the Gibraltar Government's control.

One possibility for the conservation of this species in Gibraltar is that they begin to use the newly restored habitat on the great sand slopes of the east side of the Rock. This area has recently been restored to its original habitat (Cortés *et al.* 2000). However, since there is an absence of grazers in the area, large sections of the great sand slopes are dominated by tall grasses. In Crau in France, a 50% reduction in the number of grazing sheep has resulted in taller and denser vegetation, reducing grasshopper populations and rendering them less accessible. Lesser kestrels in the area have decreased as a result (Tucker and Heath 1994). Non-intensive grazing of the site, as recommended by Tucker & Heath (1994), would be an important step towards the creation of a new foraging habitat for lesser kestrels on the Rock. Floral and invertebrate diversity would also benefit from such a measure. Since erosion is a factor to consider with regard to the Sand Slopes, large grazers such as ungulates are unsuitable. Rabbits (*Oryctolagus cuniculus*) dig extensive burrows which might threaten the stability of the slopes. A smaller grazer that is native to the hinterland, such a small, grazing rodent might be the best option. The Mediterranean pine vole (*Pitymys duodecimcostatus*) is a candidate. Further investigations into the likely impact of voles at this habitat would be required before such an introduction takes place. Large invertebrates that are found, or were found on the isthmus and talus slopes could be reintroduced to the great sand slopes, as these would provide food for foraging lesser kestrels.

### **Legislation**

At present, the lesser kestrel is protected under schedule 1 of the 'Nature Protection Act, 1991' (L/N 11 OF 1991), which protects all bird species. Schedule 3 of the Act affords further protection to endemic and restricted-range taxa. This should be extended to include globally threatened species such as the lesser kestrel. Several international conventions have been ratified by the United Kingdom on behalf of Gibraltar. These include the EC Habitats Directive (92/43/EEC), the EC Birds Directive (79/409/EEC) and the Bonn Convention (Heath & Evans 2000). The Bonn Convention aims to protect migratory species across the whole of their range. The EC Birds Directive aims to protect all birds within European territories, with particular emphasis on Annex 1 species such as the lesser kestrel. The cliff at North Front lies on the northern boundary of the Upper Rock Nature Reserve (L/N 51 of 1993). The cliffs of the Rock also receive protection as part of a Natura 2000 site under the EC Habitats Directive, due in part to the presence of breeding lesser kestrels.

## ACTION PLAN

This action plan is based on that given by Heredia *et al.* (1996), but alterations have been made to take specific aspects of Gibraltar's lesser kestrel colony and the environment in which they live into account.

### 1. Aims

1.1. In the short term, to maintain the lesser kestrel breeding colony at its present (2007) level or larger.

1.2. In the medium to long-term, to increase the population size of the lesser kestrel in Gibraltar to a level at which it no longer qualifies as a threatened species. *For both of these aims, habitat restorations, and breeding and reintroduction programmes, are important prerequisites.*

### 2. Objectives

2.1. *Grazing levels on grassland* – low density grazing should be promoted in foraging areas of lesser kestrels in order to allow for a high diversity of plants and invertebrates, and so that invertebrates are accessible. This seems particularly important on the great sand slopes (should an introduction at this site take place), as large stands of tall grasses dominate this site at present.

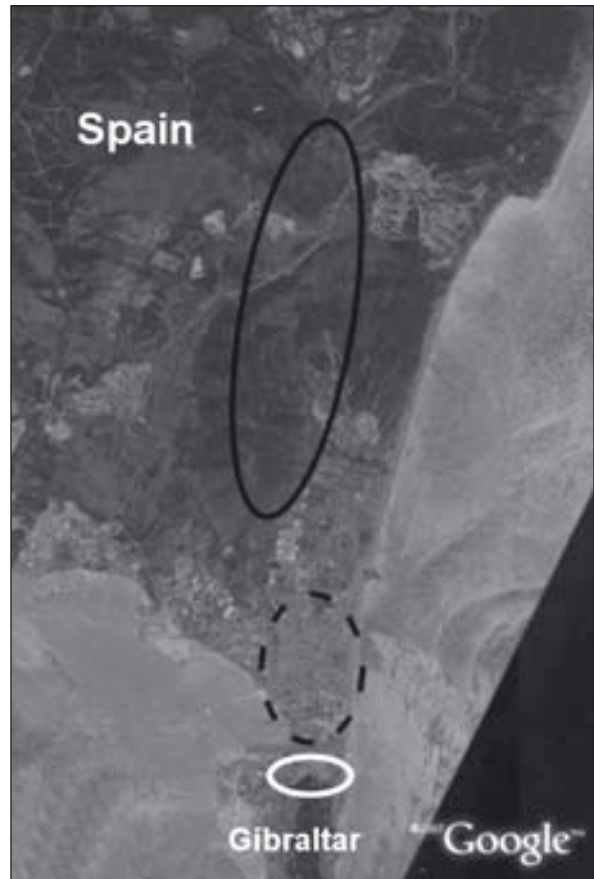
2.2. *Promote the full legal protection of the species and important sites* – It is recommended that the lesser kestrel be elevated to schedule 3 of the 'Nature Protection Act, 1991'.

2.3. *All range states should be encouraged to produce a national action plan for the Lesser Kestrel* – as such, this action plan should be adopted by the Gibraltar Government's Ministry for the Environment as the means with which to conserve the lesser kestrel in Gibraltar.

### 3. Species and Habitat Protection

3.1. *Promote the designation of protected areas for the Lesser Kestrel* – Landowners should be encouraged to manage their land in a way that is beneficial to the well-being of our lesser kestrel colony, and to implement regular conservation management. Landowners in Gibraltar are the Government of Gibraltar (sand slopes).

3.2. *Protection of the colony from disturbance* – accidental and deliberate disturbance of the colony should not occur. Industrial works taking place below the cliff face should take into account that a colony of a species of global concern exists at North Front. Similarly, tours of the tunnels within the Rock should take into account that nests are sometimes located close to Jock's Battery. Information should be supplied to all parties using the cliffs or the area immediately below these at North Front, particularly during the breeding season.



**Figure 2.** Map of the northern end of the Rock of Gibraltar and the Spanish hinterland, showing nesting site and past and present feeding sites of lesser kestrels breeding on the Rock. The white ellipse shows the location of the colony of lesser kestrels on the north face of the Rock. The black ellipses show past (dashed line) and present (solid line) feeding grounds.

#### 4. Monitoring and Research

4.1. *Surveys* - breeding surveys should continue to take place at the lesser kestrel colony at North Front every year in order to obtain an accurate picture of the species' status in Gibraltar. This should continue to include counting the number of pairs at the colony, recording the location of each nest on the cliff and counting the number of fledglings at each nest.

4.2. *Reintroduction and Recolonisation* - since lesser kestrels can be bred and reared by the GONHS Raptor Rehabilitation Unit, a possibility would be the establishment of a colony, using birds reared by GONHS, on the cliffs of the east side of the Rock. Habitat management would need to be considered before this takes place. A purpose-built wall with nest holes or strategically-placed nest boxes should also be considered. Any reintroduction or reinforcement/supplementation programmes should be carried out under the guidelines given by the IUCN/SSC Re-introduction Specialist Group (1998). Surveys, as described in 4.1., should be carried out on any newly formed colonies.

#### 5. Public awareness

5.1. *Raise awareness on the importance of lesser kestrel feeding habitats and colonies* - Public awareness campaigns on the plight of the lesser kestrel should be carried out, to include authorities, schools and the media. Being a large, attractive animal, the lesser kestrel should be used as a flagship species for the conservation and management of habitats. This should include breeding sites and foraging sites.

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