Density, Habitat Selection and Breeding Success of an Insular Population of Barbary Falcon Falco Peregrinus Pelegrinoides

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Density, habitat selection and breeding success of an insular population of Barbary Falcon *Falco peregrinus pelegrinoides*

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We studied density, habitat selection and reproduction of Barbary Falcons *Falco peregrinus pelegrinoides* on Tenerife Island during 2004 and 2005. A total of 26 breeding pairs were counted, all of them occupying natural cliffs around the island. Density observed was 1.27 pairs/100 km^2, and was positively correlated with cliff availability. Mean distance between neighbouring pairs was 5869 ± 3338 m, ranging from 1388–13 610 m; in some areas this value was as low as 2062 ± 673 m. Tenerife still shows potential for further increase regarding the observations of single females and the availability of potentially suitable but unoccupied cliffs. Falcons selected taller cliffs, more apart from roads and houses, near the coast, with lower presence of cultivated and urban areas, and associated with other cliff-nesting species. Stepwise discriminant analysis of habitat selection selected cliff height, nearest neighbour distance and distance to road, and correctly classified 71.1% of the cases. Productivity averaged 1.55 fledged young/pair and breeding success was 81.1%. No correlations were observed between habitat features and productivity. Since most territories are located in protected zones and human disturbance seems to be absent, special management measures are not necessary. However, further study into the biology of this population is required for effective and timely conservation of this species if need be.

Key words: *Falco peregrinus pelegrinoides*, density, habitat selection, reproduction, Tenerife, Canary Islands

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INTRODUCTION

The breeding range of Barbary Falcon *Falco peregrinus pelegrinoides* generally comprises arid environments from the Canary Islands and western Morocco eastwards across scattered areas of North Africa, the Middle East and some parts of central Asia (Ferguson-Lees & Christie 2001). This raptor is either considered a subspecies of the cosmopolitan Peregrine Falcon *F. peregrinus* (Brosset 1986, Del Hoyo *et al.* 1994, Wink & Seibold 1996) or an independent species (Cramp & Simmons 1980, Clark & Shirihai 1995). It shows characteristic plumage patterns and morphometric differences with respect to Peregrine subspecies, but genetic variation is quite low in the *peregrinus/pelegrinoides* group (Wink *et al.* 2000). Although the Canarian breeding falcons mainly show the Barbary phenotype, haplotypes of both *F. peregrinus brookei* and *F. p. pelegrinoides* are present according to a preliminary study carried out in Fuerteventura (Amengual *et al.* 1996).

According to the last available estimate, around 75 pairs breed in the Canary Islands, where all islands are occupied (Siverio & Concepción 2003). Until the end of the 1980s, its presence and reproduction were only confirmed for some localities on the eastern Canary Islands (Hernández *et al.* 1991). Since then, its known breeding distribution has expanded to the rest of the islands (Delgado *et al.* 1999, Martín & Lorenzo 2001) and some aspects of its breeding biology have been studied (Delgado *et al.* 1999). In Tenerife its presence was mentioned in the past by Meade-Waldo (1893) and Thanner (1909), but the first breeding record was obtained as late as June 1991 (Hernández *et al.* 1992).

The density and breeding habitat of *F. peregrinus* have been studied extensively (Gainzarain *et al.* 2000, Jenkins 2000a, Sergio *et al.* 2004, Wightman & Fuller 2005). However, little is known about the distribution pattern of Barbary Falcon elsewhere, and no quantitative studies on breeding habitat preferences exist, save for El Hierro (Rodríguez & Siverio 2006).

The principal aims of the current study are: i) to analyse distribution pattern and density of breeding pairs of Barbary Falcon on Tenerife Island in relation to breeding habitat selection, and ii) to estimate breeding success and its relationship with habitat characteristics.

MATERIAL AND METHODS

Study area

The Canary Islands are a volcanic archipelago, which is located 100 km off the Atlantic coast of north-west Africa (27°37'–29°25'N and 13°20'–18°19'W), comprising seven major islands with some small islets and rocks. The island of Tenerife is the larger one (2034 km^2 and 3718 m a.s.l.), and it is situated in the central part of the archipelago. Vegetation and landscape are influenced by north-easterly humid winds, altitude and orientation. Lower altitude coastal zones of the island are covered by sparse and xeric vegetation dominated by several succulent shrubs species (Fig. 1). Different types of forest associated with local climate (thermophilous, laurel and pine woods) appear at altitudes between 300 and 2000 m. In the central higher altitude part of the island some endemic shrub species dominate the landscape (Morales & Pérez 2000, Fig. 1). Tenerife has approximately 800 000 inhabitants, the majority of which are concentrated along the coast (Morales & Pérez 2000).

Field procedures

During the breeding seasons (February–May) of 2004 and 2005, suitable cliffs were inspected in search of established pairs. The locations of some pairs were already known before the current study commenced (in this sense, some nest data presented in this work refer to the period 1992–2005). Observation points and transects on foot were used to pinpoint for each pair the breeding cliff and nest site. The presence of an established pair was assumed when displaying or perched adults were present, and the nest site, recently used perches on cliffs, territorial defensive behaviour and/or juveniles were also recorded. Wherever possible, each occupied territory was checked at least three times (prelaying, incubation and chick-rearing periods) to determine the breeding outcome.

Territories of Common Buzzard *Buteo buteo*, Osprey *Pandion haliaetus* and Raven *Corvus corax*, all three potential competitors for nest sites, were noted during field observations, in addition to data collected during previous investigations on these species (Siverio 2006, authors unpubl. data).

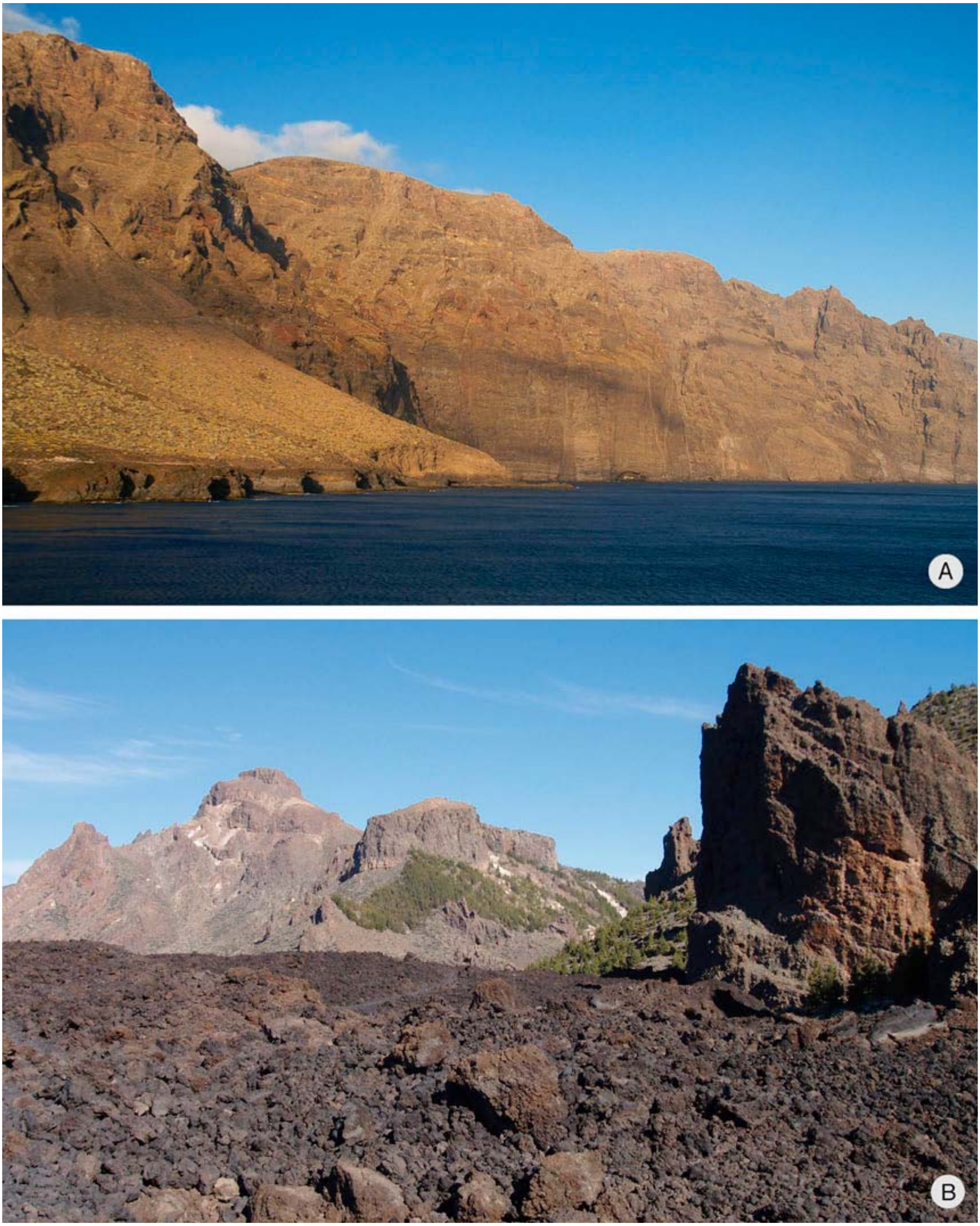

Figure 1. Different breeding habitats of Barbary Falcon on Tenerife Island: A) sea cliffs of Teno massif in the northwest of the island, B) rock faces and lava fields above 2000 m altitude in the Teide National Park.

Data analysis

Territory dispersion was estimated by means of the *G*-Statistic, the ratio between geometric and arithmetic means of the squared nearest-neighbour distances (NND, Table 1). Values approaching 1 (>0.65) indicate a high degree of regularity, and those close to 0 randomness (Brown 1975). Deviation from randomness toward regularity of nest spacing was evaluated by means of the test proposed by Clark & Evans (1954).

To evaluate the effect of cliff availability, forested areas and human occupation on density, a Spearman's rank coefficient was calculated between the number of pairs present in each 10-km UTM (Universal Transverse Mercator) square and the percentage of forest land, cliff availability and dispersion of centres of human occupation. These variables were obtained by dividing the 10-km square into cells of 1x1 km (in the cases of coastal areas, cells consisting of sea were not

Table 1. Variables used in the description of habitat and nests of the Barbary Falcon on Tenerife Island.

Variable	Description
Cliff characteristics	
ALT	Altitude in metres above sea level, from the top of the cliff.
ORI	Orientation index, with higher scores for the sunniest and most sheltered orientations: 1, NE; 2, N & E; 3, NW & SE; 4, W & S; 5, SW.
HEIGHT	Maximum height in metres of the cliff.
DOMINANCE	Average difference of altitude – measured on the map – between the top of the cliff and the end of three imaginary lines of 1 km that, from the cliff top, progress forward forming a right angle and its bisection.
STEPNESS	Difference in altitude between the highest and the lowest point within a 500 m circle around the cliff.
DISTCOAST	Distance in metres to the nearest point of the coast.
DISTROAD	Distance in metres to the nearest paved road.
DISTNPROAD	Distance in metres to the nearest unpaved road.
DISTPATH	Distance in metres to the nearest path.
DISTHOUSE	Distance in metres to the nearest inhabited house.
NND	Distance in metres to the nearest occupied falcon territory.
PRESBUTEO[a]	Presence of Common Buzzard breeding pair.
PRESPAN[a]	Presence of Osprey breeding pair.
PRESCOR[a]	Presence of Raven breeding pair.
%FOREST[a]	Percentage of land territory covered by trees.
%SHRUB[a]	Percentage of land territory covered by shrubs.
%SEA[a]	Percentage of territory covered by sea.
%OTHERS[a]	Percentage of land with human uses (cultivations, houses, roads, etc.).
PROTAREA	Location of territory inside a natural protected area.
CLIMBING	Presence of climbing equipment in the crag.
Nest characteristics	
NESTALT	Nest altitude in metres above sea level.
NESTHEIGHT	Height of nest in respect to the ground.
RELNESTPOS	Relative height (%) nest/cliff, calculated as NESTHEIGHT/HEIGHT x 100.
NESTORI	Orientation index like ORI.
TYPE	All nests were divided in three categories: edge, cavity or other.

[a] Variable measured in a 9 km^2 circle around occupied and unoccupied sites.

considered), and noting the proportion of these with cliffs, forest and human centres (see Gainzarain *et al.* 2000 for similar procedure).

Twenty variables were used to describe nesting cliffs and surrounding areas, and to quantify interspecific competition (Table 1). These variables were measured in the field using GIS aerial photographs or 1: 25 000 scale maps. Only the most recently used sites were considered in the statistical analysis. The same variables were measured in twenty-six randomly chosen, apparently suitable cliffs (≥ 50 m in height, vertical, dominant cliff with crevices or ledges adequate for breeding), unoccupied by falcons. To avoid the effect of intraspecific competition, unoccupied crags had to be more than 1 km away from the nearest established falcon pairs (consistent with the approximate minimum distance recorded between occupied nests in the same year).

Variables for occupied and unoccupied cliffs were compared using *t*-test, Mann-Whitney *U*-test or *G*-test (Table 2). For *t*-tests, some variables were log-transformed to reduce the effects of non-normal distributions, as identified by Kolmogorov-Smirnov tests. To understand habitat selection by falcons, the same variables (excluding PRESBUTEO, PRESPAN, PRESCOR, PROTAREA and CLIMBING; see Table 1) were employed in a stepwise discriminant analysis (Fisher's Linear Discriminant Functions). A 5% level of significance was specified for including variables in each step of the analysis. To test the validity of the model cross validation was employed.

Table 2. Mean values (± SD) of variables measured at territories of Barbary Falcon, and at unoccupied cliffs on Tenerife Island. Statistical results of univariate tests between the two samples ([a] *t*-test; [b] *t*-test carried out on the log transformed variable; [c] *U*-test; [d] *t*-test carried out on the variable arcsin transformed; [e] % of occupied and unoccupied sites with the presence of other species, climbing equipment or inside a natural protected area, in this case, differences tested by means of a *G*-test on the count data; significance level: * $P < 0.05$, ** $P < 0.01$).

Variable	Occupied sites (n = 26)	Unoccupied sites (n = 26)	P-value
ALT[b]	698.5 ± 588.8	853.0 ± 660.2	0.281
ORI[c]	3.3 ± 1.4	3.0 ± 1.1	0.280
HEIGHT[b]	230.0 ± 126.1	133.5 ± 66.4	0.001**
DOMINANCE[c]	205.0 ± 154.3	201.0 ± 130.5	0.920
STEPNESS[a]	441.2 ± 178.1	404.9 ± 144.1	0.423
DISTCOAST[c]	3660.9 ± 4916.1	4252.4 ± 4766.2	0.164
DISTROAD[b]	1450.9 ± 1153.7	605.5 ± 700.7	0.007**
DISTNPROAD[b]	1065.1 ± 969.0	590.2 ± 553.2	0.033*
DISTPATH[b]	320.6 ± 237.8	321.5 ± 307.4	0.749
DISTHOUSE[b]	1879.4 ± 1568.7	1344.0 ± 1344.0	0.018*
NND[a]	5869.6 ± 3338.7	4821.6 ± 2171.9	0.186
%FOREST[d]	15.4 ± 27.1	17.5 ± 23.6	0.512
%SHRUB[d]	46.7 ± 26.3	41.5 ± 29.6	0.382
%SEA[d]	24.8 ± 25.0	10.3 ± 15.6	0.015*
%OTHERS[d]	13.1 ± 16.6	30.6 ± 30.1	0.034*
PRESBUTEO[e]	65.4	61.5	0.773
PRESPAN[e]	15.4	0	0.015*
PRESCOR[e]	26.9	0	0.001**
PROTAREA[e]	96.2	76.9	0.340
CLIMBING[e]	26.9	15.4	0.306

To describe nest sites five variables were used (Table 1). In addition to nests located during the study period, all known nest sites used by falcons during 1992–2005 in an intensively controlled area (Teno massif, northwest of the island; M. Siverio unpubl. data) were also considered.

Breeding success was calculated as the percentage of successful pairs (at least one fledged young) from the total number of pairs checked during the incubation period ($n = 16$ in 2004, and $n = 21$ in 2005). Productivity and fledging rate were calculated as the number of young fledged per territorial and successful pair, respectively. Potential differences in breeding success among years were tested by means of the *G*-test or Mann-Whitney *U*-test. Wherever possible fledged young were sexed according to size differences (females larger than males). Spearman's coefficient correlation analysis was employed to determinate the effect of habitat variables on breeding performance, first separately for each year, then pooled for all breeding attempts, using mean values of productivity for pairs that were observed in both years.

Means and parameter estimates are reported together with standard deviations. All statistical calculations were carried out using SPSS (version 12.0) statistical package and statistical significance was set at $P < 0.05$.

RESULTS

Density

A total of 26 breeding pairs of falcons, showing field characteristics of Barbary, were recorded in Tenerife occupying natural cliffs. Also, two single females were recorded holding territories, and pairs or single birds were observed in some unoccupied sites that were potentially suitable for breeding; these were omitted from the present analysis. Total density on the entire island was 1.27 pairs/100 km^2. Mean distance between neighbouring pairs was 5869 ± 3338 m, ranging from 1388–13 610 m. In some areas, such as Teno massif (Fig. 1), this distance was as small as 2062 ± 673 m ($n = 7$ pairs). The *G*-statistic value (0.52) indicated a non-regular dispersion of breeding territories. However the spacing pattern of territories deviated from randomness toward regularity ($z = 3.19$, $P < 0.005$).

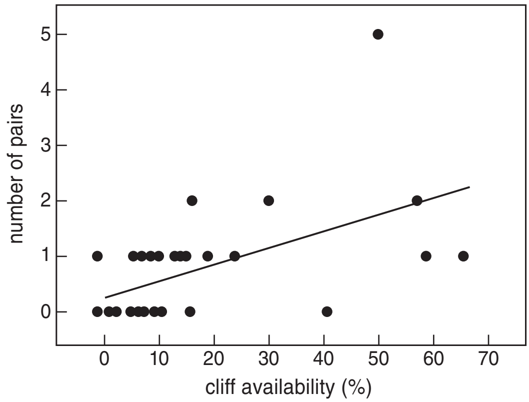

Figure 2. Relationship between the number of Barbary Falcon pairs and cliff availability (expresed as percentage of 1x1 km squares with presence of cliffs) in the UTM squares of 10x10 km of Tenerife Island.

Number of breeding pairs in each 10 km-square ranged between 0 and 5. Only one variable (cliff availability) of the three considered was significantly correlated with falcon density ($r_s = 0.629$, $n = 34$, $P < 0.001$; Fig. 2).

Habitat selection

Only large and natural cliffs, both in coastal and inland areas, were used by falcons in Tenerife. Mean altitude (measured on the top of the cliffs) of falcon territories was 697.6 m (median 425 m; range 75–2250 m). Only two pairs, located in the Teide National Park, occupied crags at an altitude in excess of 2000 m (Fig. 1).

Significant differences between occupied and unoccupied crags were detected in eight variables (Table 2). Falcons clearly selected taller cliffs, farther apart from roads and houses, near the coast and with a lower presence of human-transformed areas. Furthermore, the presence of other cliff-nesting species (such as Osprey and Raven) was significantly different between occupied and unoc-

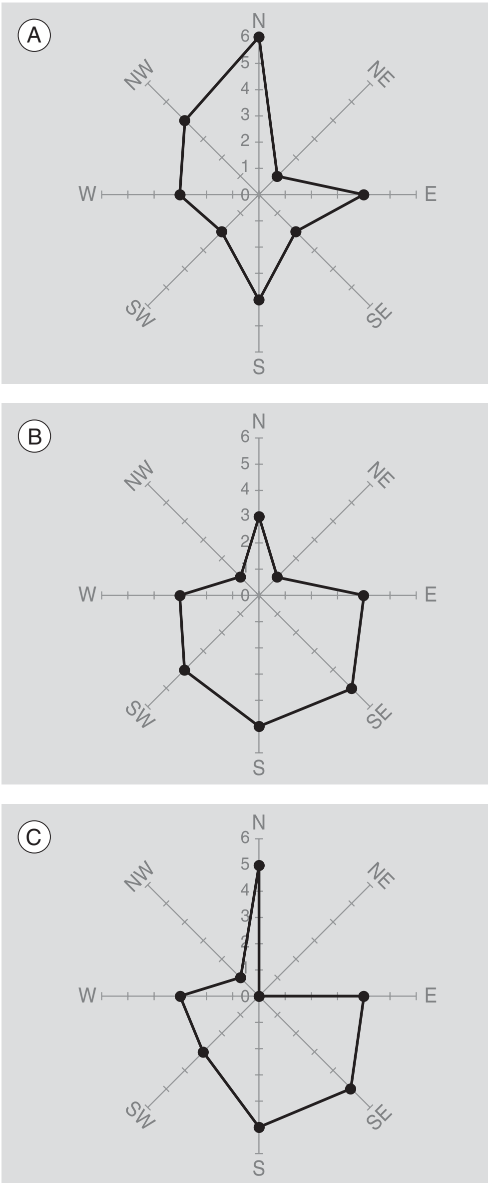

Figure 3. Slope aspect of cliffs and nest sites considered in the present study (A = unoccupied cliffs, B = occupied cliffs, C = nest sites).

cupied sites by falcons. In addition, the falcons tended to use only more sheltered orientations (southwest-facing) for nests and cliffs (Fig. 3).

Table 3. Coefficients of the Fisher's Linear Discriminant Functions obtained for the occupied and unoccupied cliffs by Barbary Falcons on Tenerife Island, and percentages of correct cliff classifications according to the model (n = number of cliffs).

Variables	Occupied Cliffs	Unoccupied Cliffs
LogHEIGHT	52.966	47.418
NND	0.003	0.003
LogDISTHOUSE	22.547	19.278
Arcsin%FOREST	–0.359	–0.293
Constant	–103.242	–80.229
% correct classified	73.1 (n = 19)	76.9 (n = 20)
% correct classified cross validation	65.4 (n = 17)	76.9 (n = 20)

Table 4. Physical characteristics of nests of Barbary Falcon found on Tenerife Island during 1991–2005.

Variables	Minimum	Maximum	Mean ± SD n = 26
NESTALT	65	2150	625.62 ± 556.24
NESTHEIGHT	30	387	142.42 ± 98.23
RELNESTPOS	23.29	79.86	53.41 ± 17.57
NESTORI	-	-	3.42 ± 1.24

Four variables were selected for the discriminant analysis: LogHEIGHT, NND, LogDISTHOUSE and Arcsin%FOREST (Table 3). The percentage of correctly classified cliffs was 75.0% (73.1% and 76.9% for occupied and unoccupied, respectively). The robustness of the model was shown after using cross validation as it correctly classified approximately the same percentages of cliffs (Table 3).

All nests were located opportunistically in barren cavities (61.5%) or on ledges (34.6%), except one which was located in an old Raven nest (Table 4). No differences were found between sheltered (orientation index values 4–5), neutral (3) or exposed (1–2) nests to dominant winds in comparison with a random distribution (G_2 = 2.486, P = 0.288). Maximum altitude and height for all known nests were 2150 m and 387 m, respectively. Nests were usually placed in the upper half of the cliff, with a mean height of 142 m from the base of the cliff (Table 4). During the period 1992–2005, seven intensively monitored pairs in the northwest of the island used on average 2.86 alternative nests (range 1–5).

Breeding success

Breeding output was similar in 2004 and 2005 (Table 5), with a mean productivity of 1.55 and a fledging rate of 1.76 over the two years combined. Average breeding success was 81.1%, and no significant differences were found between years in breeding success (G = 0.784, P = 0.376) or fledging rate (U = 110.0, P = 0.438).

In 2004, negative relationships were detected between fledging rate and three habitat variables (n = 13): HEIGHT (r_s = – 0.759, P < 0.05), STEPNESS (r_s = – 0.639, P < 0.05) and ORI (r_s = – 0.720, P < 0.05). In the same year a positive relationship was found between productivity and % FOREST (r_s = 0.627, P < 0.05). In contrast, during 2005, or when data were pooled, no significant relations were detected between productivity and the variables employed to describe habitat features. A total of 28 fledged young were sexed and no differences were found in sex ratio (14 males and 14 females).

Table 5. Breeding parameters of Barbary Falcon on Tenerife Island during 2004–2005

	2004	2005
Number of pairs	16	21
Breeding success (%)	87.5	76.2
Mean productivity	1.38	1.65
Mean brood size at fledging	1.64	2.20

DISCUSSION

Previous research on Barbary Falcon has mainly been focused on field identification and taxonomic status (Brosset 1986, Clark & Shirihai 1995, Wink & Seibold 1996, Schollaert & Gilles 2000, Wink *et al.* 2000, Corso 2001). In general, very little is known about its biology worldwide (Dementiev 1957, Hogg 1983, Delgado *et al.* 1999, Brouwer & Mullié 2000, Ming *et al.* 2003). Traditionally it has been considered a desert form of the Peregrine (Cramp & Simmons 1980, Ferguson-Lees & Christie 2001).

In the Canary Islands this falcon was very rare in past decades (Bannerman 1963), but a substantial increase in population size has occurred in the entire archipelago in the last 15 years (Delgado *et al.* 1999, Siverio & Concepción 2003). On Tenerife, a 20% mean annual increase has been estimated over the last 14 years (Hernández *et al.* 1991, present study). Most European Peregrine populations are currently recovering from the collapse induced by bioaccumulation of toxic organochlorines via prey species, and recently their numbers appear secure again in the major part of their distribution range (Ratcliffe 1997). Although no precise data are available for the Canaries, current legal status, hunting regulation on wild birds and the high number of feral pigeons and doves supposedly play an important role in the population increase. The present density in Tenerife appears to be similar to other healthy Peregrine populations worldwide (Ratcliffe 1962, Olsen & Olsen 1988, Pepler *et al.* 1991, Carlier 1993, Ratcliffe 1993, Norris 1995, Gainzarain *et al.* 2000, Zuberogoitia *et al.* 2002), and to Barbary Falcon populations elsewhere in the Canaries (Rodríguez & Siverio 2006). The observations of solitary females holding territories and the similarity between occupied and unoccupied sites indicate the potential for further increase.

Our results confirm that Barbary Falcons prefer high cliffs in Tenerife, such as for example Teno massif (Fig. 1), where also breed an important Raven population and all Osprey pairs of the island (Siverio 2006, authors unpubl. data).

However, in the eastern Canary Islands, where large cliffs are scarcer than on western islands, breeding pairs are also observed at small and accessible hills situated in wide lava fields (B. Rodríguez unpubl. data). In general, Peregrines prefer large cliffs situated in areas with short vegetations and far away from human population centres; density and distribution are closely related to cliff availability (Donázar *et al.* 1989, Jenkins 1994, Gainzarain *et al.* 2002). Heights of cliffs used by Peregrines vary according to their availability, showing a preference for higher, more dominant locations with respect to the surrounding area (Pepler *et al.* 1991, Ratcliffe 1993, Gainzarain *et al.* 2000). This fact is positively related with breeding success and foraging efficiency (Mearns & Newton 1988, Jenkins 2000b).

There is no simple explanation for the fact that productivity in our study area was negatively related to cliff height, sheltered orientations of cliff faces and ruggedness of the nesting area; and positively related to percentage of forested land during 2004. However, it is likely that climatic stability, geologic characteristics of cliffs (an abundance of insulated potential nest sites) and the absence of potential predators may explain some of these findings. The positive correlation with forest cover on the island may be spurious because of the small surface area of forest anyway.

In cold-wet climates, Peregrines actively select sheltered and sun exposed cliff-nest orientations, and the opposite in warm climates (Olsen & Olsen 1989b, Norris 1995, Gainzarain *et al.* 2000, Jenkins 2000a), and this could be positively related to breeding success (Mearns & Newton 1988, Olsen & Olsen 1989a). In the Canaries, the structural characteristics of cliff faces (an abundance of crevices and ledges for potential nest sites), may explain why only one falcon pair used an old Raven nest. In other regions stick nests represent around 30% of Peregrine nests (Ratcliffe 1993).

Whereas normally areas with a low density of paved road are selected by falcons (Gil-Sánchez 1999, Gainzarain *et al.* 2000), transformed human areas are also used by Peregrines and Barbary Falcons as breeding, hunting or wintering sites, and many man-made structures are utilized as perching or nesting sites (Ratcliffe 1993, Brouwer & Mullié 2000, Ferguson-Lees & Christie 2001). In Tenerife, Barbary Falcon seem to avoid heavily transformed human areas for breeding, but they commonly hunt over towns and villages and occasionally perch on electricity pylons.

Mean brood size at fledging observed on Tenerife was in the lower range of values reported for Peregrine in European populations; however, breeding success was relatively high (review in Rizzolli *et al.* 2005). The latter may be related to the stability of a favourable climate and a prolonged breeding season of falcon's prey species on the island (Jenkins 1991, Jenkins & Hockey 2001, Martín & Lorenzo 2001). Adverse weather with snow during the breeding season only rarely occurs at some high altitude nesting cliffs.

Never before – as far as we know – has the density of Barbary Falcons been this high on Tenerife, and some expansion is still possible. The present conservation status seems to be satisfactory, and we found no evidence of severe persecution or disturbance by humans. Falcons, however, occasionally kill racing pigeons, and as pigeon fancying is a popular sport on the island a conflict of interest may arise in the future. General knowledge on the ecology and biology of the Barbary falcon is still incomplete, and further study into diet composition, age structure of the population and survival would improve its conservation status, particularly in aiding early detection of negative population trends (Balbontín *et al.* 2003, Pandolfi *et al.* 2004, Rizzolli *et al.* 2005).

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SAMENVATTING

Hoewel de meningen over de soortspecifieke status van de Barbarijsche Slechtvalk onder taxonomen en cladisten nog steeds uiteenlopen, wel of niet een soort, is de biologie van deze aan de Slechtvalk *Falco peregrinus* verwante soort slecht bekend. Dat staat in schril contrast met de Slechtvalk zelf, die overal ter wereld uitputtend is onderzocht. In deze studie worden dichtheid en habitatkeus op Tenerife bekeken, het grootste van de Canarische eilanden op 100 km voor de kust van NW-Afrika. Deze vulkanische rotsklomp is ruim 2000 km^2 groot en herbergde in de middenjaren 2000 – naast 800 000 mensen – 26 paren en enkele ongepaarde territoriale vrouwtjes. De valken nestelden op natuurlijke kliffen, met een gemiddelde afstand tot het dichtstbijzijnde buurpaar van ruim 5800 m (lokaal, zoals in het Teno massief, echter slechts 2062 m). De valken hadden een voorkeur voor hoge kliffen gericht naar het zuidwesten. Daarentegen werden gebieden met menselijke activiteiten juist gemeden als broedplaats, zij het dat ze in die gebieden wel jagend werden waargenomen. De productiviteit lag met gemiddeld 1,55 jongen per paar aan de lage kant van de spreiding bij Slechtvalken; daarentegen was maar liefst 81% van de paren succesvol. Er werden geen duidelijke verbanden gevonden tussen productiviteit en gemeten habitatvariabelen. Het stabiele klimaat, de aanwezigheid van talrijke goed tegen de zon beschermde nestplekken op de ruige kliffen en de afwezigheid van potentiële predatoren zullen daar mede debet aan zijn. Aangezien nog tal van dergelijke nestplekken onbezet zijn, of door een ongepaard vrouwtje werden geclaimd, is er potentie voor verdere uitbreiding. Conflicten met mensen zijn vooralsnog niet aan de orde. Het vliegen met Postduiven *Columba livia* is echter een populaire sport op Tenerife, en dat zou op termijn tot vervolging kunnen leiden als de valken vaker postduiven gaan vangen. (RGB)

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