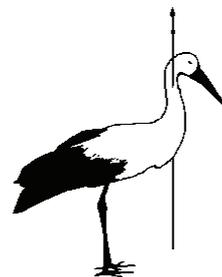


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The avifauna of Ibiza: an updated checklist including comments on abundances and ecology

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Abstract. The Balearic Islands Menorca, Mallorca, Ibiza and Formentera are known to be of immense significance for European birds migrating to the South. They are used either as intermediate stops on the route to Africa or as the final winter destination. The Balearic bird communities also incorporate many permanent residents, however. The seasonal dynamics and the specific island situation have fascinated bird watchers for centuries. Continuing this tradition, the authors investigated the avifauna of Ibiza in the course of five excursions, carried out in the spring and fall of the years 1998-2001. Altogether, 110 bird species were identified audiovisually in various habitats around the coasts of Ibiza and the hilly landscape behind the coastline. The authors present a species list with comments on biology and ecology. Zoogeographical remarks are made regarding the spread of the Eurasian Collared Dove (*Streptopelia decaocto*). New data on the feeding ecology of three species are given: Barn Owl (*Tyto alba*), Long-eared Owl (*Asio otus*), and Woodchat Shrike (*Lanius senator*).

Kurzfassung. Die Balearen Menorca, Mallorca, Ibiza and Formentera spielen eine wichtige Rolle für europäische Vögel auf dem Weg zu ihren Winterquartieren. Sie werden als Zwischenstation auf dem Weg nach Afrika genutzt oder zur auch selbst Überwinterung. Daneben gibt es viele Brutvögel. Der jahreszeitliche Wechsel und die Inselfituation haben Vogelbeobachter seit Jahrhunderten fasziniert. Die Autoren folgten dieser Tradition und erstellten im Verlauf von fünf Exkursionen nach Ibiza im Frühjahr und Herbst der Jahre 1998-2001 eine kommentierte Artenliste mit Angaben zur Biologie und Ökologie. Insgesamt 110 Vogelarten wurden audiovisuell in Habitaten an der Küste und im anschließenden Hügelland identifiziert. Zoogeographische Überlegungen erfolgen zur Ausbreitung der Türkentaube (*Streptopelia decaocto*). Es erfolgen neue Angaben zur Nahrungsökologie von Schleiereule (*Tyto alba*), Waldohreule (*Asio otus*) und Rotkopfwürger (*Lanius senator*).

Key words: Balearic Islands, Ibiza, bird species, checklist, ecology

Introduction

Besides the millions of tourists who visit the Balearic Islands in every year, the four islands Menorca, Mallorca, Ibiza, and Formentera (the latter two also known as the Pityusic Islands) also attract many people interested in exploring their specific fauna and flora. Particular attention has been paid to the bird fauna inhabiting terrestrial, littoral, marine, and sometimes also fresh water areas. According to the review of v. JORDANS (1914, 1933), ornithological observations on the Balearic Islands have a long tradition and date back to the year 1653 when the first reports on the bird fauna

of Mallorca were published. Further classical avifaunistic explorations were conducted several times during the course of the 18th and 19th centuries for all the Balearic Islands. Modern overviews of Balearic avifauna have been provided by V. JORDANS (1914), MESTER (1971), BANNERMAN & BANNERMAN (1983), and CLAVELL I CORBERA (2002). The authors reviewed ornithological observations, even those providing data on the ecology of one single species, carried out during the 20th century. To date, 489 bird species are known to occur in Spain (without the Canary Islands), 436 of which are recorded to have flown over the province Catalunya (DE JUANA ET AL. 2000). 427 bird species have so far been recorded temporarily visiting or permanently living on the Balearic Islands, among them many exotic species (MAYOL 2003).

Numerous bird species set off from their European breeding habitats and migrate towards African territories, where they spend the European winter period. Migrating birds on their way south which usually choose the western course over the Iberian peninsula and/or the short passage over the Western Mediterranean Sea, but are known to visit the Balearic Islands. The structure of pan-balearic bird migration has been well described by many authors, in specific studies as well as in general avifaunistic publications (e. g., GOETHE 1933, MOREAU 1953, MOREAU & MOREAU 1953, BLONDEL & VIELLIARD 1966, JENNING 1972, BAIRLEIN 1985).

Since 1973, when the union of environmental research, or GOB¹ (Grup Balear d'Ornitologia i Defensa de la Naturalesa) was founded, the number of ornithological observations has increased considerably. The GOB has also successfully initiated Balearic ornithological research in the fields of zoogeography, ecology and behaviour and critically evaluated incoming data. Since 1985, GOB activity has resulted in the publication of annual ornithological reports, *Anuari Ornitològic de les Balears* (e. g. REBASSA ET AL. 1998; GONZÁLEZ ET AL. 2000, 2002; RIERA et al. 2001; SUÁREZ ET AL. 2004, 2005; MARTÍNEZ ET AL. 2006). Most recently, two inventories of the avifauna of certain regions of Ibiza have been published: the "Parc Natural de Ses Salines", including the salt flats (MARTÍNEZ 2003: 54 species recorded) and the northern part of the island, which is mostly free of anthropogenic influences (PALERM & CARDONA 2004).

Although the established network of GOB-related ornithological activity has produced many useful data on the structure, diversity and dynamics of Balearic bird communities, we believe that there is still space for additional studies, especially because the density of avifaunistic observations for the four Balearic Islands is not always the same. Therefore, we set out to explore the avifauna of Ibiza in five field excursions and some additional experiments on the feeding ecology of certain resident species. The present paper provides a summary of these investigations and tries to contribute to a better understanding of habitat selection and temporal co-existence of breeding and migrating birds on Ibiza.

Materials and methods

Ornithological observations were carried out during five excursions to Ibiza in the years 1998-2001. Observations were made at different times of the year with the aim

¹ <http://www.gobmallorca.com>

of covering the different succession stages within the bird community caused by transcontinental migrants. Very thorough studies were conducted during March and April 1999, 2000 and 2001. Additional data were obtained from excursions in the fall of the years 1998 (October) and 1999 (November), with reduced personnel, however. Birds were determined either visually with the aid of binoculars and/or by recording the song. Where possible, the number of bird species present in a given habitat was counted visually. With regard to the study area, the main focus of our bird watching activity was the north east of the island, and more precisely a triangle including the town and surroundings of Santa Eulària des Riu, the village Sant Carles de Peralta and the littoral areas of the north eastern coastline. We also checked other localities such as both parts of the salt flats (“regió grossa” and “regió petita”) in the south of Ibiza which are located between the airport and Puig des Falcó.

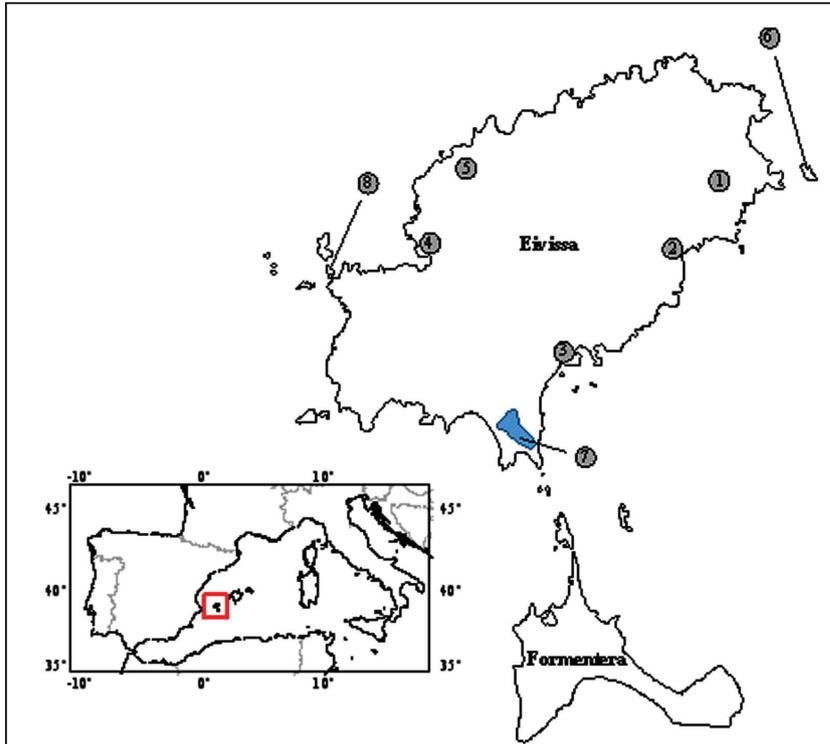


Fig. 1. Map of the Pityusic Islands Ibiza and Formentera and their geographical position within the Western Mediterranean basin (red square in the left figure). The numbered circles inside the map indicate settlements and some bird watching sites. 1 – Sant Carles de Peralta 2 – Santa Eulària des Riu 3 – Eivissa 4 – Sant Antoni de Portmany 5 – Sta. Agnès de Corona 6 – Island of Tagomago 7 – Salt flats 8 – Island of Illa des Bosc.

Efforts were made to include the main terrestrial and marine littoral habitats characterized by a specific geological profile and vegetation, including ruderal locations near villages, urbanisations or big towns, agricultural fields (with red soil, “terra rossa” and often lined by spacious brick walls), pinewood forests (dominated by *Pinus halepensis* and *P. pinea*), degraded bushy areas close to the coast (“Macchie”, “Garrigue”; e. g. juniper trees), waste disposal sites (near the Cala

Olivera), golf courses, sandy beaches, rocky shores (including the steep wall formations lining the coast of the north west of Ibiza), small islands situated in the vicinity of Ibiza's coastline, and finally the open sea. Figure 1 provides an overview of all the major urbanisations and villages in Ibiza and, moreover, of all those areas visited for our ornithological observations.

Results and discussion

A total of 110 bird species were recorded for Ibiza while undertaking extensive ornithological observations in March/April 1998-2001 and October/November 1998-1999, including both permanent residents and migratory birds. The species list with remarks on abundances, habitat preferences and status classification is given in the appendix.

Our observations are not always congruent with the results obtained by two comprehensive studies by MARTÍNEZ (2003) and PALERM & CARDONA (2004). For instance, our list for those bird species inhabiting Ibiza's salt flats lacks certain species more recently identified by MARTÍNEZ (2003), including residents such as the Water Rail (*Rallus aquaticus*) or the Pheasant (*Phasianus colchicus*). One reason for this incongruency is clearly the longer time span the authors mentioned had for their observations.

Observations on the distribution of the Eurasian Collared Dove (*Streptopelia decaocto*) and data on the feeding ecology of the Barn Owl (*Tyto alba*), Long-eared Owl (*Asio otus*) and the Woodchat Shrike (*Lanius senator*) are discussed in detail.

The population of the Eurasian Collared Dove (*Streptopelia decaocto*) in Ibiza.

In the framework of the excursions 1999-2001, the Eurasian Collared Dove (*Streptopelia decaocto*) was only observed in the eastern part of Ibiza, close to the coastal line. According to our observations, *S. decaocto* occurs in all urbanisations, pinewood forests and agricultural zones situated between the beach Cala Mastella (northeast of Ibiza and Jesús) and north of the capital Eivissa. To date, we have no explanation for the absence of *S. decaocto* from all other parts of the island (Fig. 2). It is well known that the distribution of *S. decaocto* in Europe shows periodical changes which can be best described as oscillations. Accordingly, the first Italian record of *S. decaocto* in Italy in 1944 was due to a westerly expansion of the population in southeast Europe. In the 1970s, there was a further westerly expansion, including to Corsica and southern France. Since 1974, *S. decaocto* is reported to have settled and successfully bred in northwest Spain and in Portugal (HOFSTETTER & STERNER 1994). However, there is no evidence in previous literature for the occurrence of the Eurasian Collared Dove on the Balearic Islands (v. JORDANS 1914, MESTER 1971, MAYOL 1990, HEARL 1996, HEARL & KING 1996). Recently, MAYOL (2003) stated that *S. decaocto* is a breeding resident on the Balearic Islands and has a tendency to extend its range further south and west. Most recently, his view was confirmed by MARTÍNEZ ET AL. (2006) who consider *S. decaocto* to be a permanent breeding resident in Menorca, common in Mallorca but rather rare in Ibiza. Martínez and his co-workers propose a timeline of immigration according to which Mallorca was first reached somewhere in the 1990s, followed by Menorca in 1997, followed Ibiza in 1999, and finally Formentera in 2004. Altogether, the literature hitherto screened contains the following records for *S. decaocto* in Ibiza: 1997 – Cala Llonga, Santa Eulària des Riu and Sant Antoni de Portmany

(REBASSA et al. 1998; 1999) – Can Marines, Santa Eulària des Riu and Sant Antoni de Portmany (GONZÁLEZ ET AL. 2000, 2000) – Sant Joan (RIERA ET AL. 2001, 2001) – Santa Eulària des Riu (GONZÁLEZ ET AL. 2002, 2003) – salt flats (SUÁREZ ET AL. 2004) – Sant Jordi and Can Verger (SUÁREZ ET AL. 2005).

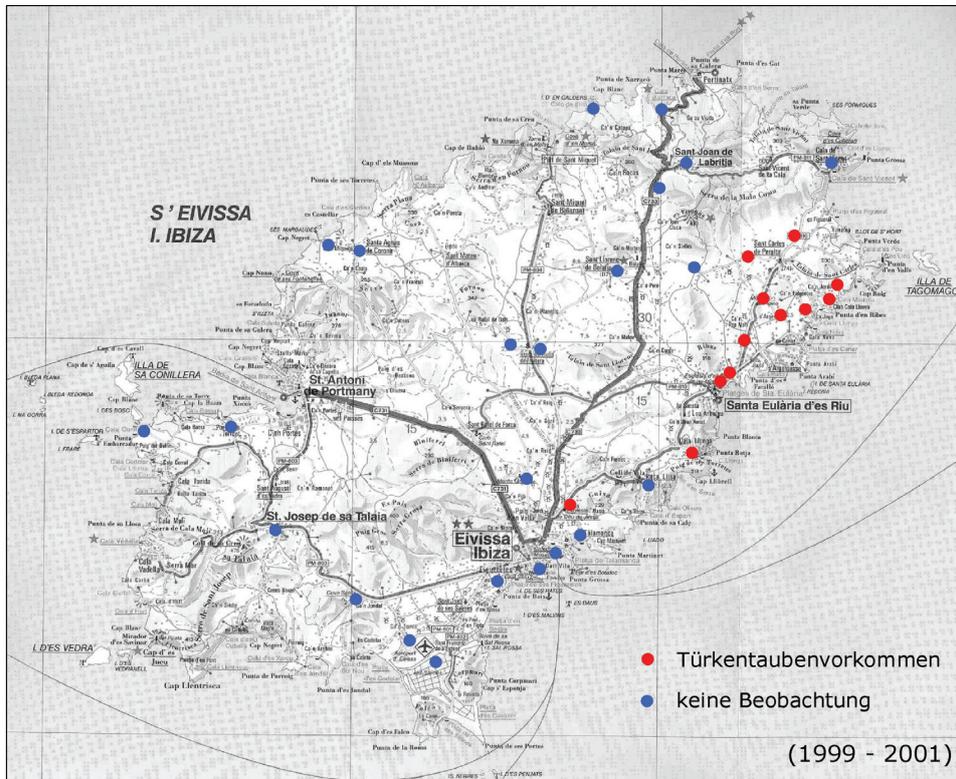


Fig. 2. Distribution of the Eurasian Collared Dove *Streptopelia decaocto* on the island of Ibiza according to our observations between 1999 and 2001 (a red dot indicates the presence of more than one individual).

Based on our recent observations, previous views of the distribution of *S. decaocto* on the island of Ibiza have to be modified. On the one hand, the sharply delimited occurrence along the eastern coast and associated hinterlands fits very well those descriptions given in previous literature (Fig. 2). On the other hand, we are not able to confirm the alleged population near Sant Antoni de Portmany, Sant Joan (both villages located in the western part of Ibiza) and the salt flats in the South.

Therefore we assume that the new population of *S. decaocto* in Ibiza stems from specimens having flown over from Mallorca. Even though it is so far uncertain in which year this immigration took place, the limited presence of the species along the eastern coast of Ibiza and the fact that the island of Mallorca is located north-easterly of Ibiza clearly speaks for this general course of expansion. Formentera was then most likely populated by immigrants having left Ibiza. Our assumption is again confirmed by the timeline of recorded immigration in all Balearic Islands: Ibiza in 1999, Formentera in 2004. The geographical proximity of Formentera, located approximately ten kilometres south of Ibiza (Fig. 1), obviously facilitates the further, southerly expansion of the range of *S. decaocto*.

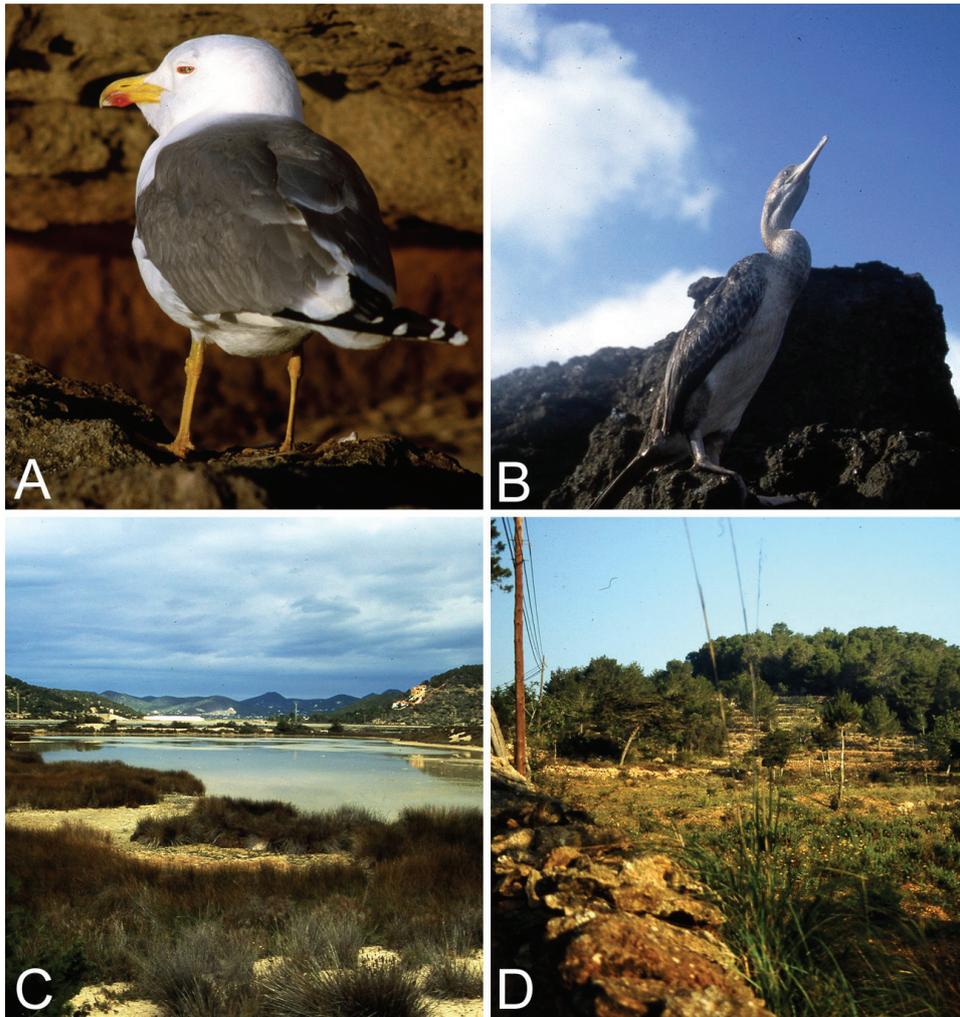


Fig. 3 A-D. A-B. Portraits of two bird species abundant in Ibiza. A. Yellow-legged Gull (*Larus michahellis*). B. European Shag (*Phalacrocorax aristotelis*). C-D. Two characteristic habitats in Ibiza investigated with respect to the avifauna. C. View of the smaller part of the salt flats (“régio petita”) close to the airport in the South of Ibiza. D. View of a cultivated landscape showing pine trees (e. g. *Pinus halepensis*) and agricultural fields arranged in various terraces. All photographs taken during the excursion in March/April 2000.

The feeding ecology of the Barn Owl (*Tyto alba*). In spring of the years 2001 and 2002, hundreds of *Tyto alba* pellets, each containing the remains of digested prey, were collected in a long disused quarry located southwest of Sant Carles de Peralta (SOMMER ET AL. 2005). A thorough examination showed that 2,767 vertebrate individuals had been eaten by *T. alba* within and around the finding location. Among these vertebrates, mammals were the dominant group (91,8%), followed by other bird species (6,0%) and reptiles (2,2%). Furthermore, SOMMER ET AL. (2005) detected one individual of the Iberian Water Frog (*Rana perezi*) and 12 specimens belonging to different insect taxa (Scarabaeidae und Saltatoria). One important result of this study was the first record of the European free-tailed bat (*Tadarida teniotis*) for Ibiza.

SOMMER et al. (2005) moreover highlighted the unexpected presence of 14 captured specimens of the Pityusic lizard (*Podarcis pityusensis*) in the prey spectrum of *T. alba*. The finding of *P. pityusensis* in the pellets of *T. alba* is even more surprising as the activity rhythms of the two species do normally not overlap.

The feeding ecology of the Long-eared Owl (*Asio otus*). In spring 2001, hundreds of *Asio otus* pellets were collected by R. Sommer and H. Zoller in a quarry near Sant Miquel de Balansat which has been not in use for many decades. These pellets were analyzed for bones or integumental remains of vertebrates as well as for exoskeletons of insects (Tab. 1). The results of this analysis not only give us interesting insights into the preferences of *A. otus* as a predator but also show the composition of the fauna of small vertebrates. Based on this analysis by Sommer and Zoller (who kindly provided unpublished data), we now know that, among vertebrates, the mouse species *Apodemus sylvaticus* represents the preferred prey organism. Pine forests seem to be the main hunting habitat of the Long-eared Owls examined. It is, however, a remarkable fact that in terms of quantity bird species (63,7%) contribute more to the feeding spectrum of *A. otus* than small mammals (36,4%). The high percentage of birds in the feeding spectrum of *A. otus* is astonishing since it is not well documented in the literature. One necessary condition for this prey spectrum is a high availability of birds in the vicinity of the hiding and breeding places of the Long-eared Owl (GLUTZ VON BLOTZHEIM & BAUER 1994).

Table 1. Results of the prey analysis of Long-eared Owls *Asio otus* from a quarry near Sant Miquel de Balansat (Ibiza, Spain) according to Sommer (hitherto unpublished material, here partly used with kind permission). Bird remains were determined by J. Fiebig and S. Frahnert (Museum für Naturkunde Berlin).

Prey species	Minimum number of individuals	Total of prey individuals
	n	%
Mammalia		
<i>Rattus rattus</i>	1	0,4
<i>Rattus</i> sp.	5	2,1
<i>Apodemus sylvaticus</i>	68	28,1
<i>Mus spretus</i>	9	3,7
<i>Crocidura russula</i>	5	2,1
Total	88	36,4
Aves		
<i>Passer domesticus</i>	38	15,7
<i>Carduelis chloris</i>	22	9,1
<i>Carduelis carduelis</i>	5	2,1
<i>Fringilla coelebs</i>	29	12,0
<i>Serinus serinus</i>	25	10,3
<i>Sylvia</i> sp.	14	5,8
<i>Parus</i> sp.	1	0,4
Fringillidae undet.	1	0,4
Passeriformes undet.	19	7,9
Total	154	63,7
Total number	242	100,0

The feeding ecology of the Woodchat Shrike (*Lanius senator*). In spring 1999, mummified remains of the prey of *Lanius senator* were found speared on the upper tips of the barbed wire separating Ibiza Airport from the “regió grossa”, the more extended part of the salt-winning fields and the Ericaceae-dominated vegetation surrounding these salt flats. A detailed examination of the prey remains revealed that *L. senator* seems to prefer specimens of the Pityusic lizard *Podarcis pityusensis* (21 carcasses found along approximately one kilometre of the entire fence line), followed by one specimen each of the common land snail *Helix aspersa*, an unidentified beetle and one bumble-bee. Two years later, in spring 2001, a further examination of the same part of the airport fence line revealed a much lower quantity of speared prey. Only four beetles and two bumble-bees were discovered.

The spectrum and appearance of prey fit well to descriptions given for *L. senator* and its strategies for treating captured animals. However, *L. senator* was never observed actively killing or spearing lizards or insects. With the exception of some species passing by on the islands of Ibiza and Formentera, the Woodchat Shrike is the only *Lanius* species observed which is also generally known to occur in Ibiza and to populate the salt flats in particular. Specimens of *L. senator* living on the other Pityusic Island Formentera preferably feed on *Podarcis pituysensis* and on chicks of the Kentish Plover (*Charadrius alexandrinus* (MESTER 1971). However, the action of capturing and spearing or clamping the prey is thought to be unusual for the Woodchat Shrike. The spectrum of prey organisms widely contains insects of various taxa, only under exceptional circumstances are small vertebrates killed (GLUTZ VON BLOTZHEIM & BAUER 1993).

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Appendix: Species list with comments

Depending on the number of observations, the frequency of a given species was assigned either to the category single or occasional observations, meaning that the

species seems to be rare in Ibiza, or to the class of abundant species. The latter category too contains both residents permanently populating and possibly breeding in the terrestrial, littoral and/or marine habitats of Ibiza, and migrants temporarily living on the island. If more than one individual of a given species could be found, the authors were usually able to estimate local abundances. Our estimations of the abundances are moreover compared to the official status all observed bird species in Ibiza are supposed to have, based on the latest report by MARTÍNEZ ET AL. (2006). If compared to other resources in the current literature, specific comments and references are added to the list. The English common names are based on the standard work of BEAMAN (1994). The scientific naming of the 110 bird species listed is in accordance with the current rules of zoological nomenclature. The inner structure of the species list corresponds to the system of HELBIG (2005) which reflects the generally accepted hypothesis on phylogenetic interrelationships among recent bird taxa.

Common Shelduck (*Tadorna tadorna*)

Observations: inhabits salt flats, 2-10 individuals encountered in March/April 1999; one individual in March 2000.

Status: rare summer resident. Occasional resident and migrant during winter.

Mallard (*Anas platyrhynchos*)

Observations: inhabits salt flats, with a maximum frequency of eight individuals in March/April 1999; one male and one female seen in March 2000. In addition, one female accompanied by six juveniles was observed in March/April 1999 near Santa Eulària des Riu.

Status: was seen breeding in 1998. rare winter resident and migrant.

Red-breasted Merganser (*Mergus serrator*)

Observation: only one individual could be spotted in March/April 1999 in the Bay of Santa Eulària des Riu.

Status: rare winter resident.

Red-legged Partridge (*Alectoris rufa*)

Observations: species was generally observed at many locations, however only a single record in March/April 1999. Examples: up to a maximum of six individuals at Serra Grossa (March/April 1999), two individuals north-west of the Cala Llenya (November 1999), three times two individuals at Can Jordi (March 2000), plucked feathers of one individual at the Cala Olivera (March 2000).

Status: sedentary and abundant species.

Common Quail (*Coturnix coturnix*)

Observation: one individual was seen on agricultural fields near salt flats in March/April 1999.

Status: sedentary and abundant species.

Greater Flamingo (*Phoenicopterus roseus*)

Observations: populates salt flats in considerable numbers: 22 individuals in October 1998; maximum of 60 individuals in March/April 1999; more than 170 individuals in November 1999; 22 individuals in March 2000.

Status: summer resident apparently non-breeding, abundant winter resident and migrant.

Black-necked Grebe (*Podiceps nigricollis*)

Observations: lives in salt flats, two individuals found in March/April 1999.

Status: very occasional winter resident and migrant.

Cory's Shearwater (*Puffinus diomedea*)

Observations: generally to be considered a common species, more than 15 individuals recorded flying over the waters around the island of Tagomago in March/April 1999.

Status: occurs in moderate numbers during the summer, in contrast only rare resident in winter.

Balearic Shearwater (*Puffinus mauretanicus*)

Observations: more than 25 individuals recorded flying over the waters around the island of Tagomago in March/April 1999.

Status: abundant during the summer, rarely observed winter resident.

Great Cormorant (*Phalacrocorax carbo*)

Observations: a maximum of five individuals observed at the Port of Santa Eulària des Riu in March/April 1999.

Status: rarely observed winter resident.

European Shag (*Phalacrocorax aristotelis*)

Observations: generally, the species turned out to be quite abundant around the coastal waters of Ibiza in March/April 1999, a maximum number of 40 individuals was observed above the waters around the island of Tagomago (also March/April 1999).

Status: sedentary and abundant species.

Cattle Egret (*Bubulcus ibis*)

Observations: only rarely spotted on agricultural fields west of Santa Eulària des Riu: one individual in October 1998 and one individual in November 1999.

Status: considered to be a rarely occurring winter resident and migrant.

Great Egret (*Casmerodius albus*)

Observations: seen in salt flats: three individuals in March/April 1999.

Status: record possibly due to an accidental deviation from the usual flying routes.

Grey Heron (*Ardea cinerea*)

Observations: regular occurrence detected in March/April 1999, species inhabits salt flats: maximum number up to ten specimens in March/April 1999, only one individual seen in March 2000.

Status: winter resident and migrant in moderate numbers.

Little Egret (*Egretta garzetta*)

Observations: inhabits salt flats: maximum number of ten individuals encountered in March/April 1999, another six individuals in March 2000.

Status: known to be a summer resident species which does not reproduce, also present during wintertime as resident and migrant in moderate numbers.

Osprey (*Pandion haliaetus*)

Observations: very occasionally found in salt flats: one individual each in October 1998 and March/April 1999. Additional observations at Sant Carles de Peralta in March/April 1999 (one individual and north of the Cala Olivera in November 1999).

Status: rare winter resident and migrant, extinct as breeding bird.

Eurasien Marsh Harrier (*Circus aeruginosus*)

Observation: seen once in salt flats in March/April 1999.

Status: rare winter resident, migrant in moderate numbers.

Common Kestrel (*Falco tinnunculus*)

Observations: regular presence recorded in general in March/April 1999, one specimen seen flying over a plain near Santa Agnès de Corona in March 2000.

Status: sedentary and abundant species, also winter resident in moderate numbers.

Eleonora's Falcon (*Falco eleonora*)

Observations: four specimens observed along the northern coastline in October 1998, a maximum of six individuals also seen on steep walls and cliffs around the island of Tagomago in the same year.

Status: abundant summer resident.

Peregrine Falcon (*Falco peregrinus*)

Observations: one individual spotted north of the golf course close to the urbanisation Roca Llisa in March/April 1999, also two individuals observed on steep walls and cliffs around the island of Tagomago; in addition, one individual in November 1999 west of Sant Antoni de Portmany.

Status: sedentary and abundant species, rarely present as winter resident.

Common Crane (*Grus grus*)

Observation: recorded once strutting through salt flats in March 2000 (one individual).

Status: considered rare winter resident and migrant.

Water Rail (*Rallus aquaticus*)

Observation: recorded once strutting through salt flats in March/April 1999 (one individual).

Status: sedentary but very rare species.

Common Moorhen (*Gallinula chloropus*)

Observations: maximum of ten specimens found close to the mouth of the former river of Santa Eulària des Riu in March/April 1999.

Status: sedentary but rare species (also during wintertime).

Common Coot (*Fulica atra*)

Observation: one specimen seen close to the mouth of the former river of Santa Eulària des Riu in November 1999.

Status: considered to be a rare winter resident and migrant.

Stone-curlew (*Burhinus oedicnemus*)

Observations: three individuals spotted at the margins of Can Vicent d'en Pere in March/April 1999, another five individuals in November 1999 and seven individuals in March 2001 at the same location.

Status: sedentary and abundant species, however rare winter resident and migrant.

Black-winged Stilt (*Himantopus himantopus*)

Observations: regularly lives in salt flats, more than 150 individuals encountered in March/April 1999, further 21 individuals in March 2000.

Status: abundant summer resident, occasional migrant.

Grey Plover (*Pluvialis squatarola*)

Observation: one specimen seen strutting through salt flats in November 1999.

Status: rare winter resident and migrant.

Northern Lapwing (*Vanellus vanellus*)

Observations: seven individuals seen walking in the transition zone between airport and salt flats in November 1999.

Status: winter resident and migrant, occurring in moderate numbers.

Little Plover (*Charadrius dubius*)

Observations: inhabits salt flats, one individual each seen on several days in March/April 1999.

Status: rare but then sedentary species, rare migrant.

Ringed Plover (*Charadrius hiaticula*)

Observations: inhabits salt flats: two individuals observed in March/April 1999, further three individuals in November 1999.

Status: rare winter resident and migrant.

Kentish Plover (*Charadrius alexandrinus*)

Observations: inhabits salt flats: 6-9 individuals observed in March/April 1999, another two individuals seen in November 1999 as well as nine individuals in March 2000.

Status: sedentary and abundant species, as a migrant especially abundant during the winter period.

Common Sandpiper (*Actitis hypoleucos*)

Observations: single observations along the entire coast of Ibiza and in salt flats in March/April 1999.

Status: considered a non-breeding summer resident, also very occasional resident and abundant migrant in the winter.

Common Redshank (*Tringa tetanus*)

Observations: two individuals noticed strutting through salt flats in November 1999.

Status: rare winter resident, also migrates in moderate numbers.

Common Greenshank (*Tringa nebularia*)

Observations: occasionally detected strutting through salt flats: each one individual in October 1998 and March 2000, two individuals in November 1999.

Status: rare winter resident and migrant.

Green Sandpiper (*Tringa ochropus*)

Observation: one individual observed strutting through salt flats in March/April 1999.

Status: rare winter resident and migrant.

Wood Sandpiper (*Tringa glareola*)

Observations: 1-3 individuals seen strutting through salt flats in March/April 1999.

Status: migrant in moderate numbers.

Little Stint (*Calidris minuta*)

Observations: populates salt flats, more than 20 individuals seen in November 1999.

Status: winter resident and migrant in moderate numbers.

Dunlin (*Calidris alpina*)

Observations: inhabits salt flats, four individuals observed in November 1999.

Status: exceptional winter resident, but migrates in moderate numbers.

Great Skua (*Stercorarius skua*)

Observations: two individuals watched flying the bird over the Balearic Sea between the islands of Mallorca and Ibiza in March/April 1999 as well as one individual a fair distance from the eastern coastline of Ibiza in March/April 1999.

Status: presence surprising and probably accidental.

Unidentified Gull species (*Larus* sp.)

Observations: about 500 individuals flying above and feeding on a waste disposal site near the Cala Olivera in March 2000.

Black-headed Gull (*Larus ridibundus*)

Observations: occasionally visits salt flats, some observations made in March/April 1999.

Status: abundant winter resident and migrant.

Audouin's Gull (*Larus audouinii*)

Observations: generally regular occurrence (maximum group size about ten individuals) in March/April 1999 and 2000.

Status: sedentary species, occurring in moderate numbers.

Yellow-legged Gull (*Larus michahellis*)

Observations: generally appears abundant with a maximum of 100 individuals seen around the entire coast of Ibiza in March/April 1999 and 2000, possible breeding site discovered on the Island Illa des Bosc in March 2000.

Status: sedentary and abundant species.

Great Black-backed Gull (*Larus marinus*)

Observation: one sole individual observed flying around the island of Tagomago in October 1998.

Status: presence not regular, probably due to an accidental deviation from normal migration routes.

Rock Pigeon (*Columba livia domestica*)

Observation: plucked feathers of one individual of an almost white domestic specimen found near the Cala Olivera in March 2000 (kindly determined by Dr. W.-D. Busching; Naumann-Museum Köthen).

Status: No comments on the status of domestic *Columba livia* on Ibiza. Birds of domestic origin were reported to have bred on Mallorca in 2005. According to MAYOL (2003), individuals escaped from captivity have been observed breeding on Ibiza several times.

Common Wood Pigeon (*Columba palumbus*)

Observation: one individual observed at Sant Miquel de Balansat in March 2001.

Status: sedentary species, occurring in moderate numbers.

Eurasian Collared Dove (*Streptopelia decaocto*)

Observations: regularly seen in the eastern part of Ibiza, particularly frequent between the Cala Mastella and Jesús in March/April 1999, groups up to four individuals watched almost daily near and within the club areas of Can Jordi and Cala Llenya in March/April 2000.

Status: sedentary but seemingly rare species.

Addition: for details on observations, distribution and range expansion see chapter "results and discussion".

Barn Owl (*Tyto alba*)

Observations: one individual spotted at Santa Eulària des Riu in March/April 1999, also regularly seen westerly of the Club Can Jordi (one individual per day in March 2001).

Status: sedentary species and winter resident in moderate numbers.

Addition: For results of dietary analyses see chapter "results and discussion".

Eurasian Scops Owl (*Otus scops*)

Observations: according to brief sightings, the species seems to be regularly but singly distributed among the various terrestrial habitats in Ibiza, even though small groups of up to six individuals could be located in the surroundings of Can Vicent d'en Pere (data from March/April 1999).

Status: sedentary and winter resident abundant in number.

Long-eared Owl (*Asio otus*)

Observations: one individual spotted on the steep rocky walls of the urbanisation La Joya (situated between the beaches Cala Llenya and Cala Nova) in November 1999, furthermore two individuals observed in a quarry southeast of Sant Miquel de Balansat in March 2001.

Status: sedentary but rare species.

Addition: for more detailed data on feeding ecology of *Asio otus* see chapter "results and discussion".

Common Swift (*Apus apus*)

Observations: common bird over the entire territory of Ibiza, with a maximum number of 100 individuals in one location (data from March/April 1999); five individuals seen in salt flats in March 2000.

Status: abundant summer resident and migrant.

Pallid Swift (*Apus pallidus*)

Observations: regularly occurring species, but only going by single observations (data from March/April 1999).

Status: rare summer resident, also migrant in moderate numbers.

Alpine Swift (*Apus melba*)

Observation: one individual observed at Can Fulgencio in March/April 1999.

Status: possibly summer resident, also potential but rarely occurring migrant.

European Bee-eater (*Merops apiaster*)

Observations: five individuals observed at the Club Cala Llenya in March/April 1999, further 35 individuals near Santa Agnès de Corona in the same time period.

Status: summer resident present in moderate numbers, also abundant as migrant.

Hoopoe (*Upupa epops*)

Observations: appeared to occur regularly in various habitats in March/April 1999, especially abundant on freshly ploughed agricultural fields near Santa Agnès de Corona; further single observations made in March/April 2000.

Status: sedentary species, also enters Ibiza as a migrant in abundant numbers.

Eurasien Wryneck (*Jynx torquilla*)

Observations: regular appearance during March/April 1999.

Status: sedentary species, also winter resident and migrant occurring in moderate numbers.

Woodchat Shrike (*Lanius senator*)

Observations: regular appearance during March/April 1999 and March 2000, especially conspicuous close to salt flats, its prey (e.g. the Pityusic lizard *Podarcis pityusensis*) fixed on the tips of the barbed wire bordering the airport area.

Status: abundant summer resident and migrant.

Addition: for results of diet analyses see chapter "results and discussion".

Common Raven (*Corvus corax*)

Observations: appeared regularly in all terrestrial habitats investigated (data from March/April 1999), two individuals observed northerly of the Club Can Jordi in April 2000.

Status: sedentary species present in moderate numbers.

Great Tit (*Parus major*)

Observations: a common species in all terrestrial habitats studied (data from March/April 1999); furthermore, up to three individuals were noticed daily around the Club Can Jordi in March/April 2000 as well as each one individual on the agricultural plain near Santa Agnès de Corona and on the waste disposal site near the Cala Olivera in March 2000.

Status: sedentary and abundant species.

Greater Short-toed Lark (*Calandrella brachydactyla*)

Observations: spotted on agricultural fields near salt flats: 25 individuals in March/April 1999.

Status: summer resident and migrant appearing in moderate numbers.

Thekla Lark (*Galerida theklae*)

Observations: regularly seen, in groups of a minimum of three individuals, at salt flats as well as around and within the villages Santa Agnès de Corona, Sant Carles de Peralta and Santa Gertrudis de Fruitera in March/April 1999; further observations made in March 2000 at Port des Torrent (one individual), on the agricultural plain near Santa Agnès de Corona (two individuals) and at Escull de ses Punxes (two individuals).

Status: abundant resident

Sky Lark (*Alauda arvensis*)

Observations: two individuals each noticed in salt flats in March/April 1999 and March 2000, another two individuals observed west of Sant Antoni de Portmany in November 1999.

Status: abundant winter resident and migrant.

Sand Martin (*Riparia riparia*)

Observations: generally occurs regularly, single observations in various habitats in March/April 1999, particularly abundant in salt flats (maximum number of ten individuals in March/April 1999, four individuals in March 2000).

Status: migrant occurring in moderate numbers.

Eurasien Crag Martin (*Ptyonoprogne rupestris*)

Observations: eight individuals seen on the hill of Sa Talaia (almost 500 meters high) and three individuals observed on the steep coastline west of Santa Agnès de Corona in March/April 1999, regularly seen along the eastern coast of Ibiza in November 1999.

Status: sedentary but not common species, also only occasional as winter resident.

Barn Swallow (*Hirundo rustica*)

Observations: generally common species (with a maximum population size of more than 100 individuals at one location in March/April 1999); also observed in salt flats (15 individuals) and around the Club Can Jordi (two individuals in March 2000).

Status: abundant summer resident and migrant.

House Martin (*Delichon urbica*)

Observations: commonly found species (with a maximum population size of 50 individuals in March/April 1999).

Status: abundant summer resident and migrant.

Red-rumped Swallow (*Cecropis daurica*)

Observations: two individuals seen on the agricultural fields at Santa Agnès de Corona in March/April 1999.

Status: migrant rarely reaching Ibiza.

Cetti's Warbler (*Cettia cetti*)

Observations: five specimens noticed along the banks of the mouth of the former river of Santa Eulària in March/April 1999.

Status: sedentary but rarely seen species, appears as winter resident in moderate numbers.

Common Chiffchaff (*Phylloscopus collybita*)

Observations: generally recorded by single observations around the entire territory of Ibiza in March/April 1999, also one individual seen at the Club Cala Llenya in March 2000.

Status: abundant winter resident, also appearing as a migrant in moderate numbers.

Willow Warbler (*Phylloscopus trochilus*)

Observations: regular appearance in March/April 1999, more common in November 1999.

Status: abundant migrant.

Eurasien Reed Warbler (*Acrocephalus scirpaceus*)

Observation: observed at permanently wet places in the town of Eivissa (where *Phragmites* spec. is present): one individual seen in March/April 1999.

Status: abundant summer resident and migrant.

Zitting Cisticola (*Cisticola juncidis*)

Observations: three individuals observed in Santa Eulària des Riu in March/April 1999, also noticed in salt flats (three individuals) and at the Cala Llonga (one individual) during the same study period.

Status: sedentary and abundant species.

Blackcap (*Sylvia atricapilla*)

Observations: generally observed to be regularly distributed among the various terrestrial habitats of Ibiza (data from March/April 1999).

Status: Sedentary but rare species, in contrast abundant resident and migrant during the winter.

Marmora's Warbler (*Sylvia sarda*)

Observations: one individual each noticed around the hill of Sa Talaia in March/April 1999 and at the Cala Olivera in November 1999.

Status: sedentary and abundant species (to be treated as a subspecies *balearica*).

Subalpine Warbler (*Sylvia cantillans*)

Observation: one male specimen spotted at Punta d'Eu Valls in March/April 1999.

Status: migrant appearing in moderate numbers.

Sardinian Warbler (*Sylvia melanocephala*)

Observations: commonly observed in various terrestrial habitats in March/April 1999 and 2000.

Status: sedentary and abundant species.

Firecrest (*Regulus ignicapilla*)

Observations: generally observed to be a common species in various terrestrial habitats in March/April 1999; moreover 1-2 specimens seen almost daily around the Club Can Jordi and one individual at the waste disposal site near the Cala Olivera in March 2000.

Status: sedentary and abundant species.

Winter Wren (*Troglodytes troglodytes*)

Observations: regularly found in March/April 1999, one individual observed at the Club Cala Llenya in March 2000.

Status: sedentary and abundant species.

Ring Ouzel (*Turdus torquatus*)

Observation: one individual spotted north of the golf course Roca Llisa in March/April 1999.

Status: rare winter resident and migrant.

Common Blackbird (*Turdus merula*)

Observations: regular presence, found in various terrestrial habitats in March/April 1999; also seen almost daily at the Club Can Jordi (1-2 individuals) and at Santa Eulària des Riu (one individual) in March/April 2000.

Status: sedentary and abundant species, migrates to Ibiza in moderate numbers.

Song Thrush (*Turdus philomelos*)

Observations: regular presence, found in various terrestrial habitats: single observations in March/April 1999; higher abundances found in November 1999.

Status: abundant winter resident and migrant.

Mistle Thrush (*Turdus viscivorus*)

Observation: one individual spotted at the Club Can Jordi in March 2000.

Status: winter resident, migrates to Ibiza in moderate numbers.

Spotted Flycatcher (*Muscicapa striata*)

Observation: one individual noticed west of the Cala Boix in October 1998.

Status: abundant summer resident and migrant.

Pied Flycatcher (*Ficedula hypoleuca*)

Observations: one individual each spotted west of the Cala Boix in October 1998 and at Serra Grossa in March/April 1999.

Status: abundant migrant.

Blue Rock Thrush (*Monticola solitarius*)

Observations: generally found to be regularly distributed in habitats with sediments covered by rocks in March/April 1999; one male each observed near the Club Cala Llenya, in salt flats and at the Cala Olivera in March 2000.

Status: sedentary and abundant species.

Whinchat (*Saxicola rubetra*)

Observations: one individual each seen west of Santa Eulària des Riu in October 1998 as well as on an agricultural field in the plain of Santa Agnès de Corona in March/April 1999.

Status: abundant migrant.

Stonechat (*Saxicola torquata*)

Observations: regularly observed in March/April 1999; one male and one female specimen each noticed near Santa Agnès de Corona and at Es Port des Torrent in March 2000,

additionally one male inhabiting salt flats in March 2000.

Status: sedentary and abundant species, migrant in moderate numbers.

European Robin (*Erithacus rubecula*)

Observations: commonly detected in March/April 1999, one individual observed in the vicinity of the Club Can Jordi in March 2000.

Status: abundant winter resident and migrant.

Common Nightingale (*Luscinia megarhynchos*)

Observation: one individual found in the upper part of the former river of Santa Eulària in March/April 1999.

Status: summer resident occurring in moderate numbers, abundant in winter as migrant.

Black Redstart (*Phoenicurus ochruros*)

Observations: species rarely found in March/April 1999 but regularly observed in November 1999, one female specimen also found in salt flats in March 2000.

Status: abundant winter resident and migrant.

Common Redstart (*Phoenicurus phoenicurus*)

Observations: species only recorded by single observations in March/April 1999, found to be common in November 1999.

Status: abundant migrant.

Northern Weatear (*Oenanthe oenanthe*)

Observations: in salt flats: two individuals in March/April 1999, one individual in March 2000; two individuals noticed at the plain of Santa Agnès de Corona in March/April 1999.

Status: summer resident present in moderate numbers, also occurring as abundant migrant.

Black-eared Weatear (*Oenanthe hispanica*)

Observations: only one individual observed on an agricultural field at Santa Agnès de Corona in March/April 1999, one individual in the rocky supralittoral zone westerly of the salt flats (Platja des Cavallet) in March 2000.

Status: rare migrant.

House Sparrow (*Passer domesticus*)

Observations: a generally abundant species in March/April 1999, classified as common in March/April 2000; *Passer domesticus* is especially frequent in those areas inhabited by man: possible breeding places in holes of building walls found in Sant Carles de Peralta and Can Gorra in March/April 2000.

Status: sedentary and abundant species.

Eurasien Tree Sparrow (*Passer montanus*)

Observations: only 1-2 individuals seen in and around Can Vicent d'en Pere (data from March/April 1999).

Status: sedentary species occurring in moderate numbers.

Rock Sparrow (*Petronia petronia*)

Observations: 6-7 breeding pairs of *Petronia petronia* observed north-westerly of the Club Cala Llenya, further five individuals seen at Can Vicent d'en Pere (data from March/April 1999).

Status: sedentary and abundant species.

Tawny Pipit (*Anthus campestris*)

Observation: one single specimen observed on an agricultural field close to Santa Agnès de Corona in March/April 1999.

Status: rarely seen summer resident and migrant.

Meadow Pipit (*Anthus pratensis*)

Observations: common species observed in various habitats (data from March/April 1999).

Status: abundant winter resident and migrant.

Rock Pipit (*Anthus petrosus*)

Observation: one individual detected at the beach of the Cala Xarraca in March/April 1999.

Status: presence in Ibiza surprising, possibly caused by an accidental deviation from usual flying courses.

Yellow Wagtail (*Motacilla flava*)

Observations: one individual assigned to *Motacilla flava cinereocapilla* was spotted in salt flats in March/April 1999, further observations in salt flats: two males and one female in March 2000 and more than 50 individuals of *Motacilla flava flava* in March 2001.

Status: summer resident and migrant occurring in moderate numbers.

White Wagtail (*Motacilla alba*)

Observations: investigations speak for a regular presence in Ibiza (studies of March/April 1999); further findings in March 2000: one individual at Escull des ses Punxes, four individuals around Santa Eulària des Riu, one single individual in salt flats.

Status: abundant winter resident and migrant.

Chaffinch (*Fringilla coelebs*)

Observations: regular occurrence in various habitats detected in March/April 1999.

Status: abundant winter resident, also migrant during the winter in moderate numbers.

Hawfinch (*Coccothraustes coccothraustes*)

Observation: one individual seen at Santa Eulària des Riu in March/April 1999.

Status: rare winter resident.

European Serin (*Serinus serinus*)

Observations: abundant during the study periods in March/April 1999 and 2000, together with *Carduelis carduelis* the most abundant species of all investigated birds in March/April 2000.

Status: sedentary and highly abundant species, also very frequent winter resident and migrant.

European Greenfinch (*Carduelis chloris*)

Observations: a common species in various terrestrial habitats in March/April 1999 and 2000, estimated to be one of the most abundant species in Ibiza in March/April 2000 after *Serinus serinus* and *Carduelis carduelis*.

Status: sedentary and abundant species.

European Goldfinch (*Carduelis carduelis*)

Observations: a highly abundant species in various terrestrial habitats in March/April 1999 and 2000, together with *Serinus serinus* ranked as the most abundant species in March/April 2000.

Status: sedentary and highly abundant species, also highly abundant winter resident and migrant.

Eurasian Siskin (*Carduelis spinus*)

Observations: one individual each noticed on the steep walls situated on the northern coastline of Ibiza on October 10, 1998 and at Santa Eulària des Riu in November 1999.

Status: winter resident and migrant occurring in moderate numbers.

Common Linnet (*Carduelis cannabina*)

Observations: generally found to be common in March/April 1999; further occasional findings made in March 2000 at the Port des Torrent (one individual), at the Club Can Jordi (two individuals) and in salt flats (three individuals).

Status: sedentary and abundant species.

Cirl Bunting (*Emberiza cirlus*)

Observation: one breeding pair detected in the vicinity of the Cova Santa in March/April 1999.

Status: sedentary species present in moderate numbers.

Corn Bunting (*Emberiza calandra*)

Observations: regularly found in March/April 1999 (with a maximum of 12 individuals per habitat), another individual seen in salt flats in March 2000.

Status: sedentary species present in moderate numbers.

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