

building in 1980. Breeding success in 1985 was of 1.68 chicks/pair successfully fledged.

Key words: Yellow Legged, *Larus cachinnans*, Barcelona, Urban breeding.

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SEX, AGE AND CONDITION BIAS OF DECOY-TRAPPED CITRIL FINCHES (*SERINUS CITRINELLA*)

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Decoy traps have been used extensively in avian studies, since they allow the capture of large numbers of birds with relatively little effort. However, decoy-trapping has been found to cause a bias in the sampling of populations, bird in poor condition or young individuals having a higher chance to be attracted by decoys (WEATHERHEAD & GREENWOOD, 1981; WEATHERHEAD & ANKNEY, 1984, 1985; GREENWOOD et al., 1986). This effect can vary according to the species (WEATHERHEAD & GREENWOOD, 1981).

The Mediterranean region is the most important wintering area for european finches, and many recaptures of birds ringed in north and central Europe are made there (ASENSIO, 1984). Countries of the Mediterranean region catch during the migratory period great numbers of finches for cagebird trade, and so, this

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is an important source of ringing recoveries. The main methods used by birdcatchers are clap nets and the "liga" (the use of sticks or stiff wires coated with a sticky substance by which small birds perching on them become stuck). Both methods are traditionally associated with call and decoy-live birds.

However, ringers exceptionally use decoy birds, since they trap finches with mist nets or special traps. This is even more the rule in many countries of northern and central Europe where caging of wild birds is punished by law.

In this work the Citril Finch (*Serinus citrinella*) is used to test if there are sex, age and condition biases in the trapping of finches due to the use of these two trapping methods: clap nets associated to decoys and mist nets.

This study was conducted near Naves, in the Solsonés region (Central Catalonia, NE Spain). During the winters of 1983-1985, 136 Citril Finches were trapped using: 1) Mist nets, located in typical feeding grounds used by Citril finches and 2) Clap nets, close to feeding areas or in between them. Clap nets were always associated to live decoys of Citril Finches..

Age and sex were determined according to SVENSSON (1975). Birds were weighed to the nearest 0.5 gr, and weight was used as the best predictor of body condition (WEATHERHEAD & GREENWOOD, 1981). Since time of day was not observed to affect weight significantly (Borrás & Senar, in prep.), the condition of birds was determined independently of this factor. (nearly all the birds were trapped in the early morning). Individuals with a weight less than mean were classified as in bad body condition. If equal or higher than mean as in good body condition.

The four way contingency test on dependence among sex, age, body condition and trapping method was calculated following SOKAL & ROHLF (1979).

Table 1 shows the number of birds trapped with each method, in relation to their sex, age and body condition. From the Citril Finches' mean weight, cut off value of birds in good and bad body condition was 12 gr ($\sigma^2 = .66$). G values of the Independence Test between these four factors are given in table 2.

Age was the only factor to be clearly affected by the trapping method (AxM, table 2). When studying interactions between trapping methods and sex, and factors age and body condition it was found that there was dependence between: 1) Age and trapping method in females ($\delta\delta: X^2 = .015; p > .99; \text{♀♀}: X^2 = 10.217; p < .01$); 2) Body condition and trapping method in males ($\delta\delta: X^2 = 3.919; p < .05; \text{♀♀}: X^2 = .001; p > .95$).

First year Citril Finches are significantly more trapped with the help of decoys than adult ones. This age dependence has already been proved for other species (*Quiscalus quiscula*, *Agelaius phoeniceus*, *Sturnus vulgaris*: WEATHERHEAD & GREENWOOD, 1981;

Table 1. Four-way Contingency Table on dependence among sex, age, body condition and trapping method.

Tabla de contingencia cuatrfactorial sobre la dependencia entre los factores sexo, edad, condición física y método de trampeo.

	Weight	Mist Net		Clap Net	
		males	females	males	females
Adult	<12	2	14	5	4
	≥12	14	23	9	7
1st year	<12	1	7	5	9
	≥12	11	6	8	11

Table 2. G values of the Independence test between factos sex, age, body condition and trapping method.

Valores del Test de Independencia G entre los factores sexo, edad, condición física y método de trampeo.

Hypothesis	G	d.f.	p
Age x Body cond.	.508	1	>.20
Age x Sex	.300	1	>.50
Age x Method	8.438	1	<.01
Sex x Body cond.	5.004	1	<.05
Sex x Method	1.568	1	>.20
Body cond. x Method	1.158	1	>.20
Age x Body cond. x Method	-0.236	1	>.50
Sex x Body cond. x Method	4.332	1	<.05
Sex x Age x Body cond.	.462	1	>.30
Age x Sex x Method	3.582	1	>.05

Anas platyrhynchos: Weatherhead, in litt.), and may be related to a differential efficiency in locating food of these two age classes (WEATHERHEAD & GREENWOOD, 1981). Local enhancement is one of the most important methods of food seeking in cardueline finches (GLÜCK 1982; SENAR, 1986), whereby the feeding activity of some individuals serves as a signal to those individuals seeking food. With decoys, one artificially creates the signal of feeding activity and then, a false (or true) signal of food abundance (WEATHERHEAD & GREENWOOD, 1981). Birds less efficient in locating food, in this case first year birds, may be then more liable to be attracted by decoys and to be trapped with clap nets. This could explain the recorded age bias.

Dependence between trapping method and body condition has also been reported for other species, such as Red-winged Blackbirds (WEATHERHEAD & GREENWOOD, 1981) or Mallards (GREENWOOD et al., 1986). The reasoning given for seeking food behaviour in first year birds can also be used to explain attraction of food stressed birds to decoys (WEATHERHEAD & GREENWOOD, 1981).

Citril Finches show a complex pattern of interactions between trapping method and sex, age and body condition: only females are affected by age and only males by body condition. SHEVREE (1980) suggested that young cardueline females may have more difficulties in integrating themselves within flocks. If this were true, we could suppose that since they are more "isolated", they tend to join the decoys' flock more. First year males which are more integrated in flocks, are more efficient in locating food and do not respond so clearly to decoys. However, food stressed males, independently of their age, will try to improve food finding by joining foraging groups which apparently are successful (i.e.: decoys' flock), and so will be trapped with clap nets more often than expected. Why females in bad body condition are not attracted by decoys is a puzzling fact, and there are no apparent reasons to suppose a differential selective pressure on males than on females. Nevertheless, these results seem to show that females search mainly for a flock, and indirectly for food, whereas males search for food, and indirectly for a flock. Further research on this subject should be carried out to discern the roles of males and females in the flock.

This work has showed that an age and condition bias in the decoy trapping of Citril Finches exists. This could be applicable to other finches. Consequently, knowledge of these biases would have to be ascertained before attempting inferences on finches migratory behaviour or population dynamics based on different trapping methods. As WEATHERHEAD & GREENWOOD (1981) say, "a recognized bias is less a problem than one which goes undetected".

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ABSTRACT

Sex, age and condition bias of decoy-trapped Citril Finches (Serinus citrinella).— Decoys are extensively used in the mediterranean region to trap finches. In Citril Finches (*Serinus citrinella*) decoy-trapping causes a bias in the age and body condition of the birds caught, first year females and males in bad body condition being more easily attracted by decoys. The importance of the knowledge of these possible biases for the interpretation of ring recovery data in finches is stressed.

Key words: *Serinus citrinella*, Citril Finch, Decoy-trapping, Trapping methods.

RESUMEN

Sesgos en el sexo, edad y condición física en el trampeo del Verderón Serrano (Serinus citrinella) mediante la utilización de reclamos.— La utilización de reclamos para el trampeo de fringílidos es una técnica muy común en toda la región mediterránea. En el Verderón Serrano (*Serinus citrinella*), la utilización de reclamos produce un sesgo en la edad y condición física de los individuos que se trampean: las hembras de primer año y los machos en mala condición física son más fácilmente atraídos por los reclamos. Se discute la importancia que tiene, conocer estos posibles sesgos para la interpretación de datos de anillamiento en fringílidos.

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SEGUIMIENTO DE LA MORTALIDAD DE ERIZOS, *ERINACEUS EUROPAEUS*, PRODUCIDA POR VEHÍCULOS EN UNA CARRETERA DE POCA CIRCULACIÓN

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El hallazgo de erizos muertos es común en las carreteras durante primavera y verano (WAETCHER, 1979). HAINARD (1971) indica que los atropellos son la causa de mayor mortalidad para la especie mientras que LAWRENCE & BROWN (1973) no señalan nada en este sentido. La posibilidad de realizar un recorrido diario por una zona en la que los erizos son frecuentemente observados, ofrece la posibilidad de un censo fiel de estas muertes.

Durante todo el año 1985 se recorrió la carretera que une las localidades de León, Carbajal de la Legua y Lorenzana. La distancia entre la última edificación de León y la primera de Lorenzana es de 8,2 Km.

Los hábitats atravesados son de tipo suburbano y de campiña con: pequeños prados, choperas, setos, huertos, cultivos de secano (cereales), un bosque de *Quercus pyrenaica*, chalets y casas aisladas.

El recorrido se efectuó cuatro veces a las siguientes horas (hora solar): una de 6-8, dos de 12-14 y una de 19-21.

Se anotaron todos los erizos observados, tanto vivos como muertos. Se puso especial cuidado en buscar un cadáver donde el día anterior se había observado un erizo vivo.

También se recogieron datos en años anteriores (1980 a 1984), aunque no de una forma sistematizada.

El índice medio de vehículos diarios (I.M.D., denominación oficial del M.O.P.U.) de 1982 es de unos 2.000 vehículos.

El número de erizos observados en 1985 se expresa en la tabla 1, detectándose 18 erizos (4 vivos y 14 muertos) desde mayo hasta octubre.

Los individuos vivos solamente fueron observados en el recorrido nocturno y los muertos en el de mañana. En el recorrido de me-