

POSSIBLE FIRST RECORD OF DOUBLE BROODING IN THE TAWNY OWL *STRIX ALUCO*

POSIBLE PRIMERA OBSERVACIÓN DE DOBLE CRÍA EN EL CÁRABO COMÚN *STRIX ALUCO*

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The breeding season of birds of prey and owls is usually so long that they rarely produce more than one clutch per year (*i.e.* Newton, 1979; Cramp & Simons, 1985; Donazar, 1993; Zuberogoitia *et al.*, 2002). In fact, the onset of one breeding season occurs relatively soon after the end of the previous season (Newton, 1979; Marti, 1994; Taylor, 1994; Zuberogoitia, 2000; Zuberogoitia *et al.*, 2002). Second broods have been rarely reported for owls (Kellomäki *et al.*, 1977; Mikkola, 1983; Cramp & Simmons, 1985; Millsap & Bear, 1990; Martínez *et al.*, 2003). Only Barn Owls *Tyto alba* produce regularly two or three clutches yearly (Marti, 1994; Taylor, 1994; Martínez & López, 1999; Zuberogoitia, 2000). Nevertheless, replacement clutches (if first clutches fail early during incubation) are more common (Mikkola, 1983; Cramp & Simmons, 1985; Fry *et al.*, 1988; Bull & Henjum, 1990; Forsman *et al.*, 1997; Olsson, 1997).

Producing second clutches is possible, for instance, if first clutches are laid early in the season (see Kellomäki *et al.*, 1977; Forsman *et al.*, 1997; Marks & Perkins, 1999). The Tawny Owls' *Strix aluco* breeding season usually starts about mid March across Europe (Mikkola, 1983; Petty *et al.*, 1994; Saurola, 1995), and failed early clutches have not been reported to lead to second breeding attempts. However, the span of the Tawny Owls' breeding season in this study area (Bilbao, north Spain) is wider than elsewhere in Europe. On average, eggs are laid on the 24 March ($SD = 52.09$, $n = 126$; Zuberogoitia, 2002) and the eggs are incubated for 28 - 30 days and chicks leave the nest before attaining complete feather development at

20 - 30 days old. Chicks remain within the parents' territory for up to three or four months (Zuberogoitia & Torres, 1997). One further peculiarity of the study area is that Tawny Owls may breed throughout the year (Zuberogoitia, 2002).

A Tawny Owl population in Bizkaia was monitored between 1992 and 2003, producing a description of its breeding ecology (Zuberogoitia & Campos, 1998; Zuberogoitia & Martínez, 2000; Zuberogoitia, 2002). During the course of the study, one possible case of a second brood was registered. 1,700 Tawny Owl territories were found, although only 77 nest sites were monitored. One of these nest sites was located in a park, in the town of Mungia. It is surrounded by buildings except for one side that is close to an open field. The nearest Tawny Owl pair was located in a pine plantation 1 km away.

This pair bred in an oak located in a corner of the park before 1997. In January 1997, the oak was cut when the owls were incubating four eggs. Therefore, a nest-box was erected in an oak in the middle of the park. The owls bred in this box on 1998 and 1999. Two small chicks were found in February 1998 and 2 in February 1999. In February 2000, the nest with 2 owlets was found in the hole of a neighbouring oak, twenty meters away from the nest-box. Finally, on 1 February 2001, 2 owlets aged 25 days old were ringed in the same place. Surprisingly, on 17 August 2 different owlets (unringed) aged 45 days old were found moving in the oaks around the nest. Therefore, in 2001 two successful broods occurred consecutively in the same nest. The laying date of the

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first clutch would be in the first days of December, while the second would be during the first days of June.

These data suggest that the same pair laid a double clutch in the same year. Since it was impossible to trap the adults it is not known if both were the same in the two cases. It is unlikely that the second brood was laid by a neighbouring pair because Tawny Owls are strongly territorial, especially in the centre of their territories, and the owners would have probably expelled the intruders (see Zuberogoitia & Martínez, 2000). Territorial behaviour seems to keep out intruders even in high-density urban populations (Galeotti, 1994). So, there are four alternative hypotheses to explain the finding. 1) Another individual replaced the female or the male. If this were true it would also be the second clutch for one of them. 2) Both members could have been replaced. Even considering that the floating population is large, more time is needed to replacing two individuals, establish a territory, mate and lay a clutch (see Zuberogoitia, 2002). 3) Finally, it could be suggested that it was a case of double brooding resulting from polygynous mating. Polygyny occurs as a response to increased food supply (Korpimäki, 1988; Marti, 1992; Martínez & López, 1999). It can be simultaneous (*i.e.* the male has two females nesting at the same time) or successive (the nesting attempts occur one after other, and the β nest can occur in the α territory (Korpimäki, 1988; Marti, 1992). However, only one female was found during the survey. 4) The finding corresponded to a pair producing two clutches. The incidence of second nesting attempts can be negatively correlated with the laying date of the first clutch (Morrison, 1998; Marks *et al.*, 1999; Martínez *et al.*, 2003). This Tawny Owl pair had started breeding three months before the average for the population ever since 1997, which would favour double brooding. However, the energetic costs would be high and would affect other physiological mechanism as the moult (see Marks & Perkins, 1999; Martínez *et al.*, 2002). Therefore, according to other authors (Marks & Perkins, 1999; Martínez *et al.*, 2003) double brooding only could be carried out in situations of high prey availability to support all the extra energetic costs. Unfortunately, food abundance could not be measured. The high cost produced by double brooding in a single year would ex-

plain why only one such case was recorded in five years in the study area.

RESUMEN.—*En este estudio se aportan datos sobre la posible realización de una segunda puesta exitosa por parte del Cárabo Común (Strix aluco) en Bizkaia, norte de España. Durante cinco años se realizó el seguimiento de la misma pareja que nidificaba en un parque urbano. Esta pareja siempre realizaba las puestas en fechas tempranas, encontrándose pollos pequeños entre enero y febrero. El uno de febrero de 2001 se localizaron y anillaron dos pollos de 25 días de edad y el 17 de agosto se encontraron otros dos pollos de 45 días en el mismo lugar. Este sería un caso de doble puesta de una misma pareja o, habiéndose dado la sustitución de uno de los ejemplares, sería una doble puesta del otro.*

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BIBLIOGRAPHY

- BULL, E. L. & HENJUM, M. G. 1990. Ecology of the Great Gray Owl. USDA For. Serv. Gen. Tech. Rept. PNW-GTR-265.
- CRAMP, S. & SIMMONS, K. (Eds.). 1985. *The Birds of the Western Palearctic. Vol. II.* Oxford University Press. Oxford.
- DONÁZAR, J. A. 1993. *Los buitres ibéricos. Biología y conservación.* J. M. Reyero Editor. Madrid.
- FORSMAN, E. D., GIESE, A., MANSON, D. & SOVERN, S. 1997. Renesting by Spotted Owl. *The Condor*, 97: 1078-1080.
- FRY, C. H., KEITH, S. & UBAN, E. K. 1988. *The birds of Africa, Vo. III.* Academic Press, London.
- GALEOTTI, P. 1994. Patterns of territory size and defence level in rural and urban Tawny Owl (*Strix aluco*) populations. *Journal of Zoology, London*, 234: 641-658.
- KELLOMAKI, E., HEINONEN, E. & TIAINEN, H. 1977. Two successful nestings of Tengmalm's Owl in one summer. *Ornis Fennica*, 54: 124-135.
- KORPIMÄKI, E. 1988. Factors promoting polygyby in European birds of prey -an hypothesis. *Oecologia*, 77: 278-285.
- MARKS, J. S. & PERKINS, E. H. 1999. Double brooding in the Long-eared Owl. *Wilson Bulletin*, 111: 273-276.
- MARTI, C. D. 1992. Same-nest polygyny in the Barn Owl. *The Condor*, 94: 261-263.

- MARTI, C. D. 1994. Barn Owl reproduction: patterns and variation near the limit of the species distribution. *The Condor*, 96: 468-484.
- MARTÍNEZ, J. A. & LÓPEZ, G. 1999. Breeding ecology of the Barn Owl (*Tyto alba*) in Valencia (SE of Spain). *Journal für Ornithology*, 140: 93-99.
- MARTÍNEZ, J. A., MARTÍNEZ, J. E., OÉREZ, E., ZUBEROGOITIA, I. & IZQUIERDO, A. 2003. Possible first record of multiple brooding of the Eagle Owl *Bubo bubo*. *Ardeola*, 50: 77-79.
- MARTÍNEZ, J. A., ZUBEROGOITIA, I. & ALONSO, R. 2002. *Determinación del sexo y la edad de las rapaces nocturnas ibéricas*. Editorial Seo Montícola.
- MIKKOLA, H. 1983. *Owls of Europe*. Poyser, Carlton. London.
- MILLSAP, B. & BERA, C. 1990. Double-brooding by Florida Burrowing Owls. *Wilson Bulletin*, 102: 313-317.
- MORRISON, J. L. 1998. Effects of double brooding on productivity of Crested Caracaras. *The Auk*, 115: 979-987.
- NEWTON, I. 1979. *Population Ecology of Raptors*. T. & A.D. Poyser, Carlton, London.
- OLSSON, V. 1997. Breeding success, dispersal, and long-term changes in a population of Eagle Owl *Bubo bubo* in southeastern Sweden 1952-1996. *Ornis Svecica*, 7: 49-60.
- PETTY, S. J., SHAW, G. & ANDERSON, D. I. K. 1994. Value of nest boxes for population studies and conservation of owls in coniferous forest in Britain. *Journal of Raptor Research*, 28: 134-142.
- SAUROLA, P. 1995. *Suomen Pöllot*. Kirjayhityma Oy. Helsinki.
- TAYLOR, I. 1994. *Barn Owls. Predator-prey relationships and conservation*. Cambridge University Press.
- ZUBEROGOITIA, I. & CAMPOS, L. F. 1998. Censusing owls in large areas: a comparison between methods. *Ardeola*, 45: 47-53.
- ZUBEROGOITIA, I. & MARTÍNEZ, J. A. 2000. Methods for surveying Tawny Owl *Strix aluco* populations in large areas. *Biota*, 1: 137-146.
- ZUBEROGOITIA, I. & TORRES, J. J. 1997. *Aves Rapaces de Bizkaia*. Temas Vizcainos. BBK. Bilbao.
- ZUBEROGOITIA, I. 2000. La influencia de los factores meteorológicos sobre el éxito reproductor de la Lechuza Común (*Tyto alba*). *Ardeola*, 47: 49-56.
- ZUBEROGOITIA, I. 2002. *Ecoetología de las Rapaces nocturna en Bizkaia*. Phd. Thesis. Universidad del País Vasco. Bilbao.
- ZUBEROGOITIA, I., RUIZ MONEO, F. & TORRES, J. J. (Eds). 2002. *El Halcón Peregrino*. Servicio Publicaciones de la Diputación Foral de Bizkaia.

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