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EURASIAN EAGLE OWLS *BUBO BUBO* ADJUST NEST FOOD STORES TO NESTLING AGE

LOS BÚHOS REALES *BUBO BUBO* AJUSTAN LAS DESPENSAS DEL NIDO EN FUNCIÓN DE LA EDAD DE LOS POLLOS

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Summary.—Some bird species, particularly owls, store prey within their nests during the breeding season. Food storage has been explained by the need to buffer the environmental variability of resources available for the offspring. This study describes food stores of the Eurasian Eagle Owl *Bubo bubo* in the southeast of the Iberian Peninsula and evaluates which intrinsic and extrinsic factors influence their presence and composition. Between 2003 and 2021, we studied the presence, abundance, biomass and species richness of prey in food stores found in 318 nests. Stores occurred in 63.5% of nests and included 520 prey items belonging to 23 different species. The main prey species was the European Rabbit *Oryctolagus cuniculus* (71.43%). The greatest abundance of prey and biomass found in the stores occurred when the owlets were between 20 and 25 days old, that is when peak owlet growth occurs. Neither abundance nor biomass of prey in stores were related to brood size. Similarly, the frequency of food store occurrence in nests per year was unrelated to precipitation in the preceding months, which serves as a proxy of rabbit abundance. Globally these results support the hypothesis of that Eagle Owl parents adjust the stores according to when their owlets have their highest energy demands, irrespective of brood size and likely prey abundance. Food storage may help Eagle Owls to maximise their reproductive success in a semi-arid environment subject to high environmental variability.—Puche Gómez, S., Perales Pacheco, P., Gómez-Ramírez, P., Botella, F., Sánchez-Zapata, J.A. & Pérez-García, J.M. (2025). Eurasian Eagle Owls *Bubo bubo* adjust nest food stores to nestling age. *Ardeola*, 72: 163-174.

Keywords: breeding, *Bubo bubo,* nestlings, *Oryctolagus cuniculus,* prey, raptor, South-eastern Spain.

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Resumen.—Durante la época reproductora, algunas especies de aves, especialmente búhos, almacenan presas en el interior de sus nidos. Este comportamiento se ha asociado a la necesidad de minimizar los efectos de una alta variabilidad ambiental de los recursos alimentarios para sus crías. El objetivo de este estudio es caracterizar las reservas alimentarias del búho real *Bubo bubo* en el sureste de la península ibérica y evaluar qué factores intrínsecos y extrínsecos determinan su presencia y composición. Para ello, entre 2003 y 2021, se estudió la presencia, abundancia, biomasa y riqueza de especies de presas en las despensas de 318 nidos en el sur de Alicante. En el 63,5% de los nidos se encontraron despensas, y en ellas se registraron un total de 520 presas pertenecientes a 23 especies diferentes. La presa principal fue el conejo europeo *Oryctolagus cuniculus* (71,43%). La mayor abundancia de presas y biomasa encontrada en las despensas se produjo cuando los pollos tenían entre 20 y 25 días de edad, coincidiendo con sus picos más altos de crecimiento. No se encontró relación entre la abundancia y biomasa de presas en la despensa y el tamaño de pollada. Del mismo modo, no se detectó ninguna relación entre la frecuencia de despensas en los nidos por año y la precipitación acumulada en los meses anteriores, un indicador indirecto de la abundancia de conejos. Estos resultados apoyan la hipótesis de que los búhos reales realizan almacenamiento de presas en sus nidos fundamentalmente en el periodo de mayor demanda energética de los pollos, independientemente del número de estos y probablemente la disponibilidad anual de presas. Este comportamiento podría ser un mecanismo de esta especie para maximizar su éxito reproductor en un ambiente semiárido con grandes variaciones ambientales como es el sureste ibérico.—Puche Gómez, S., Perales Pacheco, P., Gómez-Ramírez, P., Botella, F., Sánchez-Zapata, J.A. y Pérez-García, J.M. (2025). Los búhos reales *Bubo bubo* ajustan las despensas del nido en función de la edad de los pollos. *Ardeola*, 72: 163-174.

Palabras clave: *Bubo bubo, Oryctolagus cuniculus,* pollos, presas, rapaces, reproducción, sureste España.

Introduction

Food storage involves accumulating, maintaining or manipulating potential food resources for later use (Smith & Reichman, 1984; Vander Wall, 1990). This behaviour could function as an adaptive strategy to buffer the environmental variation in resource availability that could occur under hardship conditions, such as extreme rainfall, drought or harsh winters, or to meet the high food demands of growing offspring (Vander Wall, 1990; Roberts, 1979; Masoero *et al.*, 2020). Food storing is commonly reported in a wide range of taxa, from mammals to insects (Vander Wall, 1990), and, among birds, is particularly well known in birds of prey. Some nocturnal raptors, such as the Eurasian Pygmy Owl *Glaucidium passerinum*, often accumulate prey during the autumn and winter months as a winter survival strategy (Masoero *et al.*, 2018, 2020). Others, like the Common Barn Owl *Tyto alba* and the Boreal Owl *Aegolius funereus* only store prey during the breeding season (Korpimäki, 1986; Roulin, 2004), usually in response to increased abundance of one or several main prey species (Korpimäki, 1986; Masoero *et al.*, 2020). However, food storing can also be detrimental if there is an excess of food that can rot or attract other species, such as scavengers, parasites or disease-transmitting insects to nests (Philips & Dindal, 1977; Milchev *et al.*, 2019). Therefore, species are expected to optimise time and duration of food stores based on the trophic demand of their nestlings, which may depend on brood size, nestling age or both.

The Eurasian Eagle Owl *Bubo bubo* is considered a generalist species that can capture a wide variety of prey, from invertebrates to large mammals (Penteriani & Delgado, 2019). It can adapt to the trophic availability of each territory, so its diet can vary depending on the biome and the year (Penteriani & Delgado, 2019). In Mediterranean areas Eagle Owls mainly prey on European Rabbits *Oryctolagus cuniculus* (Hiraldo, 1975; Donázar *et al.,* 1989). Rabbit reproductive cycles are temporally adjusted to primary productivity and rainfall (Moreno & Villafuerte, 1995), so that food storing may be an adaptive behavioural response to these peaks (Antón *et al.,* 2008; Penteriani & Delgado, 2019). Although food storing by Eagle Owls is well known, the ecological factors that determine its variability, in particular, are poorly understood.

This study describes the food stores in Eagle Owl nests in the southeast of the Iberian Peninsula and evaluates which intrinsic and extrinsic factors determine their occurrence and composition. The intrinsic factors considered were brood size, nestling age and laying date. In addition, we employed the accumulated rainfall during the preceding winter months as an extrinsic factor that reliably relates to rabbit abundance in Mediterranean areas (Villafuerte *et al*., 1997). We hypothesised that Eagle Owls accumulate more prey in nests prior to periods of peak nestling trophic demand and in nests with greater numbers of nestlings. In addition, more prey storage would be expected in years with high precipitation levels.

Materials and methods

Study area

The study was carried out in the southern part of Alicante province, South-eastern Spain (38.00º N, 0.86º W), covering an area of 448km^2. This region is situated in the thermo-Mediterranean bioclimatic zone, with a mean annual temperature between 17ºC and 19ºC, and experiences a semi-arid ombrotype, with low annual rainfall: 200-350mm (see detailed description in Pérez-García *et al*., 2012). The region has been declared a Special Protection Area for Birds (SPA) because it is one of the most important dispersal zones for juvenile and immature Bonelli's Eagles *Aquila fasciata* and Golden Eagles *Aquila chrysaetos* in the Iberian Peninsula (Pedauyé & Pérez-García, 2013). In addition, the area hosts one of the densest Eurasian Eagle Owl populations in the world (Pérez-García *et al.,* 2012).

Monitoring of nests and food stores

Between 2003 and 2021, 76 owl territories were located in the study area following the methodology described by Pérez-García *et al.,* (2012). The Eagle Owl shows territorial behaviour, relying on multiple nests that it uses interchangeably from one year to the next (Bettega *et al*., 2011). Between November and February, we conducted annual surveys to ascertain the presence of Eagle Owls in the territories. Between March and June, occupied territories were revisited (2020 excepted due to the global pandemic) to detect active nests. Each active nest was visited an average of 1.17 ± 0.27 times per season (range 1-3) to record the number of nestlings, their age in days according to Penteriani *et al*. (2005), and the presence of a food store (i.e. a stock of unconsumed prey). Each territory was monitored over an average of 4.18 ± 2.98 years (range 1-15 years) during the study. For each nest, we calculated the laying date, expressed as ordinal days from December 15th, the earliest egg-laying date recorded in our study area (Pérez-García *et al*., 2012), which was determined by subtracting 35 days (the average incubation period) from the hatching date, with an additional two-day adjustment for the difference between the laying date and the start of incubation (Mikkola, 1983). When recording food stores, we assessed the abundance and richness of prey in the nest. For all nests we calculated the frequency of appearance (FA) in food stores and the biomass contribution (B) of each prey item. Biomass contribution was calculated using the occurrence rates and mean standard weights of each prey item, the latter obtained from previous studies (Delibes, 1974; Blanco, 1998; Penteriani & Delgado, 2016). A distinction was made between juvenile and adult weights for the two lagomorph species due to the large difference in weight between these age classes.

Climatic data

Accumulated winter rainfall was calculated by summing the monthly rainfall from the four months preceding the mean hatching date of our population (1st week of March) for each year, between 2002 and 2021. Monthly rainfall data from November to February was obtained from the nearest weather station to the study area, at Pilar de la Horadada (Valencian Institute of Agricultural Research; http://riegos.ivia.es, 2016).

Statistical analysis

Food store presence in each owl nest was modelled using Generalized Linear Mixed Models (GLMM) as a binomial response variable (1 = presence, 0 = absence) with the predictors 'age of nestlings', 'date of monitoring' and 'year' and 'territory' as random factors. The model was built using the binomial error distribution and logit link function.

We assessed the relationship between the abundance and biomass of prey in the food store (response variables) and the predictors using GLMM (Bolker *et al.*, 2009). The predictor variables included were brood size, age of nestlings and laying date. 'Year' was included as a random term as climatic conditions could vary from one year to another, affecting both prey availability and the laying date. Models were tested including both linear and quadratic relationships for each of the fixed factors using the 'poly (x, 2)' function, as well as the interactions between fixed factors. The GLMM models for assessing the total number of prey were fitted with a Poisson error distribution and log link function, while a negative binomial error distribution was used for biomass.

To analyse the effect of accumulated rainfall in the previous months on the annual frequency of owl nests with food stores in our study area (response variable), we used a General Linear Model (GLM) with a binomial error distribution and logit link function. (Dobson & Barnett, 2018).

All models were built using the 'glmer' and "glm" function of the lme4 package, version 1.1-27.1 (Bates *et al.*, 2015). To build the models, we used the 'dredge' function in MuMln package, version 1.46.0 (Barton, 2022), which allows the fitting of all combinations of predictor variables. Model selections were performed using ranking by the Akaike Information Criterion corrected for small sample sizes (AICc). Models were assumed similar when ΔAICc < 2. The calculation of R^2m (marginal R^2 variance explained by the fixed effects) and R^2c (conditional R^2 variance explained by the entire model; i.e. fixed and random factors) was done using the 'r.squaredGLMM' function from the MuMln package, version 1.46.0 (Barton, 2022). The validation of the selected models was performed by inspecting diagnostic plots and residual values to ensure assumptions of normality and homogeneity of variance and to check the data for outliers. Parameter estimates of each of the model factors model were calculated with the 'Confint' function from the 'car' package, version 3.1-2 (Fox & Weisberg, 2019). All tests and statistical calculations were performed using R statistical software (v 4.4.3, R Development Core Team 2023). All measurements are shown as mean ± standard deviation.

TABLE 1

Abundance (N), frequency of appearance (FA%) and biomass contribution (B%) of each prey species found in 202 food stores of Eurasian Eagle Owls found in 318 nests in south-eastern Spain. The standard average weight of each species was obtained from Delibes, 1974; Blanco, 1998 and Penteriani & Delgado, 2016. (Y = Young and Ad = Adult).
[Abundancia (N), frecuencia de aparición (FA%) y porcentaje de contribución de biomasa (B%) de cada especie encontrada en 202 despensas alimentarias de búho real encontradas en 138 nidos en el sureste de España. El peso medio estándar (Weigth) de cada especie se obtuvo de Delibes, 1974; Blanco, 1998 y Penteriani & Delgado, 2016. (Y = Juvenil y Ad = Adulto).]

Species	N	FA %	weight (g)	b %
Mammals	475	84.82%		87.91%
Iberian Hare *Lepus granatensis* (Y)	2	0.36%	375	0.27%
Iberian Hare *Lepus granatensis* (Ad)	5	0.89%	1500	2.71%
European Rabbit *Oryctolagus cuniculus* (Y)	237	42.32%	250	21.39%
European Rabbit *Oryctolagus cuniculus* (Ad)	163	29.11%	1000	58.85%
Rat *Rattus* spp.	54	9.64%	215	4.19%
Garden Dormouse *Eliomys quercinus*	12	2.14%	60	0.26%
Red Squirrel *Sciurus vulgaris*	2	0.36%	320	0.23%
Birds	84	15%		12%
Red-Legged Partridge *Alectoris rufa*	34	6.07%	480	5.89%
Western Barn Owl *Tyto alba*	1	0.18%	360	0.13%
Little Owl *Athene noctua*	1	0.18%	170	0.06%
Eurasian Stone-curlew *Burhinus oedicnemus*	4	0.71%	500	0.72%
Common Buzzard *Buteo buteo*	3	0.54%	1000	1.08%
Common Kestrel *Falco tinnunculus*	1	0.18%	170	0.06%
Feral Pigeon *Columba livia* var. *domestica*	14	2.5%	200	1.01%
Common Wood Pigeon *Columba palumbus*	3	0.54%	200	0.22%
Western Jackdaw *Corvus monedula*	3	0.54%	260	0.28%
Crested / Thekla's Lark *Galerida cristata / theklae*	1	0.18%	45	0.02%
Black Wheatear *Oenanthe leucura*	1	0.18%	35	0.01%
Common Blackbird *Turdus merula*	4	7.71%	85	0.12%
Iberian Green Woodpecker *Picus sharpei*	3	0.54%	185	0.20%
Common Swift *Apus apus*	1	0.18 %	45	0.02%
Black-necked Grebe *Podiceps nigricollis*	2	0.36%	340	0.25%
Mallard *Anas platyrhynchos*	3	0.54%	1200	1.30%
Common Moorhen *Gallinula chloropus*	5	0.89%	350	0.63%
Reptiles	1	0.18%		0.09%
Ladder Snake *Zamenis scalaris*	1	0.18%	240	0.09%
Total	**560**			

RESULTS

Food stores were found in 202 out of the 318 nests sampled (63.52%), totalling 560 prey items from 23 different species (Table 1). The number of prey items found per nest was 1.76 ± 2.38, with a maximum of 25 prey (24 juvenile rabbits and one rat). Biomass averaged 0.86 ± 1.24kg per nest, with some nests with more than 8kg stored. Stores in 122 nests comprised only one prey species, in 51 there were two species, in 21 three species and, in only 8 nests, a maximum of four different species. This represents a mean species richness of 1.01 ± 1.01. Mammals were the dominant prey by frequency of occurrence, followed by birds and lastly, reptiles (Table 1). The European Rabbit was by far the most frequent species (71.43%) and contributed the highest biomass (80.25%), followed by rats, which had a frequency of appearance of 9.64% and biomass of 4.19% (Table 1).

The best model to explain the presence of a prey store in the nest included the laying date and the nestling age (quadratic) (Table 2). The random variable "year" and "territory" contributed substantially to the explained variance of the models, as is reflected in the conditional R^2c (GLMM, R^2m = 5.1%; R^2c = 18.8%).

The model that best explains the abundance of prey in the nest included only the quadratic term for nestling age (GLMM, R^2m = 21.4%; R^2c = 46.1%). Similarly, the best model to explain the prey biomass in the nest included just the nestling age (GLMM, R^2m = 7.2%; R^2c = 18.0%) (Table 2). In both models, the random variable "year" contributed significantly to the explained variance, as evidenced by the conditional R^2c. A progressive increase in both prey abundance and biomass in the food stores was observed after the hatching of the eggs, reaching its peak between 10 and 30 days of nestling age for abundance and between 15 and 35 days for biomass (Figure 1A and B).

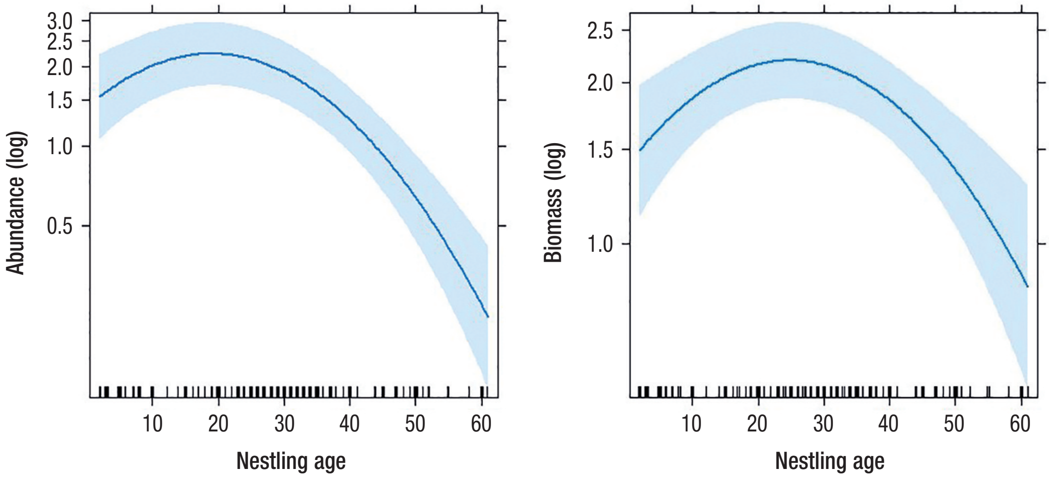

FIG. 1.—Effects of nestling age (days) on prey abundance (left) and prey biomass (right) in food stores of Eurasian Eagle Owls in South-eastern Spain. For enhanced visual representation, the y-axis is presented in logarithmic form (log).

[Efectos de la edad de los pollos (días) sobre la abundancia de presas (izquierda) y la biomasa de presas (derecha) en las despensas alimentarias de búho real en el sureste de España. Para mejorar la representación visual, el eje y se presenta en forma logarítmica.]

Although laying date was included in the selected models for both abundance and biomass in food stores, none of them showed a significant effect size (see Supplementary Electronic Material, Table S1). Furthermore, none of the models included brood size as an influential explanatory variable (see Table 2).

Finally, our analysis revealed no statistically significant relationship between the annual frequency of nests with food stores and the rainfall accumulated in the preceding months (GLM, $z = 1.44$, $p = 0.149$).

Discussion

Food storage is a behaviour helping to buffer the environmental variation of food resource availability during the raising of offspring (Smith & Reichman, 1984) and, therefore, potentially plays an important role in the adaptive strategies of many species to counter food shortage. Employing this strategy, the Eurasian Eagle Owl could maximise nestling survival during the chick rearing period in an extreme climatic environment, such as a semiarid region. This behaviour, together with a high abundance of rabbits, could have contributed to the unusually low mortality rates of nestlings in this area when compared with other Palaearctic populations (see Pérez-García *et al.*, 2012). Food storing may also enable this raptor to cope with the high local density of conspecifics or with adverse weather conditions such as extreme rainfall or drought (Bårdsen & Tveraa, 2012; Fisher *et al*., 2015).

Table 2

Generalized linear mixed model selection of food store presence, and abundance and biomass of prey in Eurasian Eagle Owl food stores in south-eastern Spain. Predictors: nestling age in days (Age) and laying date (Laying). Np = number of estimable parameters, AICc = Akaike's information criterion adjusted for small sample size I; ΔAICc = difference between current model and the model with the lowest AICc, W_i = Akaike weight.

[Selección del modelo lineal mixto generalizado de presencia, abundancia y biomasa de las presas de las despensas alimentarias de búho real en el sureste de España. Predictores: edad de los pollos en días (Age) y la fecha de puesta (Laying). Np = número de parámetros estimables, AICc = criterio de información de Akaike ajustado para un tamaño de muestra pequeño I; ΔAICc = diferencia entre el modelo actual y el modelo con el AICc más bajo, W_i *= Peso de Akaike.]*

Model	Factors	Np	logLik	AICc	ΔAICc	W_i
Presence	Laying + Age + Age^2	6	−195.958	404.2	0	0.52
	Age + Age^2	5	−613.50	404.3	0.14	0.48
Abundance	Age + Age^2	5	−612.41	1235	0	0.33
	Age	4	−613.50	1235.1	0.1	0.32
	Laying + Age	5	−612.10	1236.2	1.2	0.19
	Laying + Age + Age^2	6	−612.08	1236.4	1.4	0.17
Biomass	Age	5	−563.05	1136.3	0	0.53
	Laying + Age	6	−562.71	1137.7	1.4	0.26
	Age + Age^2	6	−562.92	1138.1	1.8	0.21

Our findings confirm the substantial reliance of the Eagle Owl on the European Rabbit in south-eastern Alicante province (Antón *et al.*, 2008). The rabbit constituted its primary prey in terms of both abundance and biomass (Table 1). The large rabbit population in the study area (Pedauyé & Pérez-García, 2013), coupled with specialisation in capture of this lagomorph, may explain this finding (Penteriani *et al.*, 2008). However, despite specialisation in capturing rabbits, up to 23 different prey species were reported in the food stores, showing that Eagle Owls can adapt their diet to consume a diverse range of other species (Penteriani & Delgado, 2019). However, the majority of these species exhibited only marginal presence in the stores, only rats *Rattus* spp. and Red-legged Partridges *Alectoris rufa* being particularly noteworthy. Several studies have linked increased predation on these suboptimal prey or increased dietary breadth in Eagle Owls to circumstances when their main prey is reduced (Hiraldo *et al.*, 1975; Jaksić & Marti, 1984; Donázar *et al.*, 1989), which clearly was not the case in the study area.

The results indicate that food storage is mainly related to the food demands of the nestlings, which are age-related, rather than influenced by brood size or external factors related to prey abundance, such as accumulated precipitation. The growth pattern in Eagle Owl nestlings is characterised by a first phase of approximately ten days, during which growth and body development are slower than in the subsequent 20-30 days (Penteriani *et al.*, 2005; Hadad *et al.*, 2024). The third phase, during ages 30-40 days, is characterised by a slowing down of growth (Penteriani *et al.*, 2005). We observed that the maximum abundance and biomass of prey in the food stores peaks around 20 days post-hatching. This period coincides with the acceleration of nestling growth and, consequently, with the highest food demand. Although we visited few nests during incubation, to avoid nest abandonment, it is noteworthy that no prey store was found in any of the ten nests visited. This could be because temperatures in the study area do not allow prey storage for extended periods or that incubating individuals consume their prey very quickly. Furthermore, the presence of uneaten prey could attract predators, increasing the likelihood of nest failure, particularly since nests in the study area are easily accessible (Pérez-García *et al.,* 2012). On the other hand, the reduced frequency of prey stores in nests with chicks of 45 days of age or older may be attributed to the rapid consumption of all prey items by the nestlings. Studies filming storage behaviour combined with provisioning across the different breeding stages would be necessary to clarify such possibilities.

In addition to the important effect of nestling age on the food stores, inter-annual variability (“year”) and the territorial identity (“territory”) played a significant role in food storing by Eagle Owls. The results may be related to temporal and spatial differences in prey abundance or micro-climatic conditions. Rainfall in autumn and winter is positively linked with the abundance and availability of their primary prey in spring (Dalbeck & Heck, 2006; Martínez *et al.,* 2006; Delibes-Mateos *et al.,* 2009; León-Ortega *et al.,* 2017). Furthermore, it has been suggested that rainfall may be a key factor influencing prey storage. However, our findings did not indicate a significant relationship between the annual frequency of food stores and rainfall in preceding months. This may indicate that food reserves are not a predictable behavioural response to anticipated resource shortages. Alternatively other local factors, such as the presence of irrigated crops in the vicinity of nests, may be acting as a buffer, decoupling fluctuations in prey populations from the influence of rainfall on natural resources and productivity. An intrinsic factor that could affect the tendency to form food stores is breeder experience. Eagle Owl mortality in this area has been very high (Pérez-García *et al.*, 2016), which would result in high turnover between territorial pairs that may influence the differences between nests. Both the types of land use in the surrounding areas of the nest and breeder experience may be contributing factors to the substantial variability explained by the 'territory' random factor in our models.

Contrary to our expectations, we found no significant relationship between the biomass and abundance of prey stored in the nest and the brood size. In contrast, Hadad *et al.*, (2023), found that the amount of prey delivered to Eagle Owl nests increased for large broods in Israel. However, the direct provision of prey to nestlings lacks the foresight component that food storage does and would therefore rely on proximal stimuli such as nestling begging calls (Sacchi *et al.*, 2002). In addition, as seen in other species like the Boreal Owl (Korpimäki, 1986), the formation of food stores would have been related to a high availability of the main prey, resulting in excess prey capture. In our study area, such behaviour would be related to inter-annual cyclic variation of rabbit numbers (Arques-Pina, 2000; León-Ortega *et al.*, 2017).

Laying date did not show a strong and clear effect in the models but was selected with other variables such as nestling age in the three best models (Supplementary Electronic Material, Table S1). This could also be related to the reproductive cycle of the main prey. Early breeding has been related to higher reproductive success through the experience of breeding pairs acting in synchrony with prey availability, matching the emergence of small juvenile rabbits. (Dalbeck & Heg, 2006; Pérez-García *et al.,* 2012). In contrast, owls that initiate reproduction later, chiefly young and inexperienced pairs, usually mainly capture heavier sub-adult or adult rabbits (e.g. Viñuela, 1993; Penteriani *et al.,* 2008). Thus, although the number of cached prey is higher in nests of early breeders, the biomass may be similar or even higher in nests of late breeders (Donázar & Ceballos, 1989). Given the climatic conditions in the study area, a stronger relationship between food storage and laying date would be expected. As temperatures rise as the breeding season progresses, the probability of prey decomposing in the food stores increases and, consequently, there is an increased probability of attracting parasites, disease-transmitting insects or potential predators to the nests, compromising reproductive success (Philips & Dindal, 1977; Milchev *et al.*, 2019). In this respect, it would be interesting to study the trade-off associated with the decision to store prey in Eagle Owls.

Summing up, although we have been able to uncover some unknown relationships between prey accumulation in food stores and reproductive parameters of Eagle Owls, we still have much to learn about the functional basis of this behaviour. Future research should study how prey availability within territories affects the composition and frequency of food stores, and how this strategy may influence breeding success.

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AUTHOR CONTRIBUTIONS.—JMPG conceived the initial idea and designed work schemes; PP, JASZ and JMPG conducted the fieldwork; SP performed all the analyses, produced the figures and tables and led the writing, with significant contributions from JMPG, PGM, FB and JASZ. All authors contributed to the literature review, reviewed manuscript drafts and gave final approval for publication.

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Table S1. Parameter estimates of the model average for presence, abundance and biomass in food stores of Eurasian Eagle Owls *Bubo bubo* in south-eastern Spain obtained by generalized linear mixed models (GLMM).
[Estimas de parámetros del modelo promedio para los modelos lineares mixtos generalizados (GLMM) de presencia, abundancia y biomasa en despensas de presas de búho real Bubo bubo *en el sureste de España.]*

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