ORNITOLOGÍA NEOTROPICAL
(2017) 28: 237–241

SHORT NOTE

FOOD HABITS OF THE MAGELLANIC HORNED OWL (*BUBO MAGELLANICUS*) IN A COASTAL ISLAND OF PATAGONIA, ARGENTINA

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Abstract · The Magellanic Horned Owl (*Bubo magellanicus*) is one of the most common nocturnal raptors in Patagonia. The aim of this note was to analyze the food habits of this species in a small island from the Patagonian Atlantic coast. Four nesting areas and eight adults of *Bubo magellanicus* were found; 217 pellets plus disaggregated material were collected. We identified 2774 individual prey items. Insects were the most consumed prey (63.56%), followed by reptiles (13.73%), arachnids (10.92%), mammals (10.42%), and birds (1.37%). Our study show *B. magellanicus* feeding mainly on arthropods and introduced species, a fact that was not previously reported for this species in Patagonia.

Resumen · Hábitos alimenticios del Tucúquere (*Bubo magellanicus*) en una isla de Patagonia, Argentina
El Tucúquere (*Bubo magellanicus*) es una de las rapaces nocturnas más comunes de la Patagonia. El objetivo de esta nota fue analizar los hábitos alimenticios de esta especie en una pequeña isla de la costa atlántica de la Patagonia. Se encontraron cuatro áreas de nidificación y ocho adultos de *Bubo magellanicus* y se recolectaron 217 egagrópilas además de material disgregado. Identificamos 2774 individuos presa. Los insectos fueron la presa más consumida (63,56%), seguidos por los reptiles (13,73%), los arácnidos (10,92%), los mamíferos (10,42%) y las aves (1,37%). La relevancia de este estudio reside en que *B. magellanicus* se alimenta principalmente de artrópodos y especies introducidas, hecho que no se había reportado previamente para esta especie en la Patagonia.

Key words: Brown rat · Darkling beetles · Darwin´s gecko · Leones Island · Patagonia · Trophic ecology

The Magellanic Horned Owl (*Bubo magellanicus*), together with the Barn Owl (*Tyto alba*), are the most common nocturnal raptors in Patagonia. Its geographic distribution ranges from central Peru and west of Bolivia to the south of Chile and Argentina (Marks et al. 1999). In Patagonia, the food habits of *B. magellanicus* have been well studied in the northwestern region (Donázar et al. 1997, Trejo & Grigera 1998, Trejo 2000, Trejo et al. 2005, Udrizar Sauthier et al. 2005), to a lesser extent in central and eastern region (Nabte et al. 2006 and references cited therein), while there is only one study carried out in the austral zone of Patagonia (Formoso et al. 2012). In addition, the diet of this species on the coastal islands of Patagonia, where the presence of its usual preys is limited and may differ from those in the continent, is unknown (Udrizar Sauthier et al. 2017). The aim of this note was to describe the diet of four pairs of Magellanic Horned Owls in a small island of the Patagonian Atlantic coast.

This study was carried out at Leones Island, of ca. 2.8 x 2 km and separated by less than one kilometer from the continent (Figure 1A). This island belongs to Parque Interjurisdiccional Marino Costero Patagonia Austral and possesses high relevance for conservation, as it hosts large colonies of seabirds (Yorio et al. 1998). Field work was carried out in March 2013, when eight adults of *Bubo magellanicus* were observed in four nesting sites of the island: Cañadón de la Vía, Península Lanaud, Cañadón de los Franceses and Cañadón a Lanaud (Figure 1B). All pellets within a radius of 200 m around each nest were collected; when pellets were disaggregated (in one of the four nests), broken pellets and separated osseous remains were carefully recovered (Figure 1B, Table 1). All pellets or disaggregated material collected at each nesting site was considered as one sample.

Receipt 12 June 2017 · First decision 25 June 2017 · Acceptance 26 October 2017 · Online publication 31 October 2017

Communicated by Jean Marc Thiollay

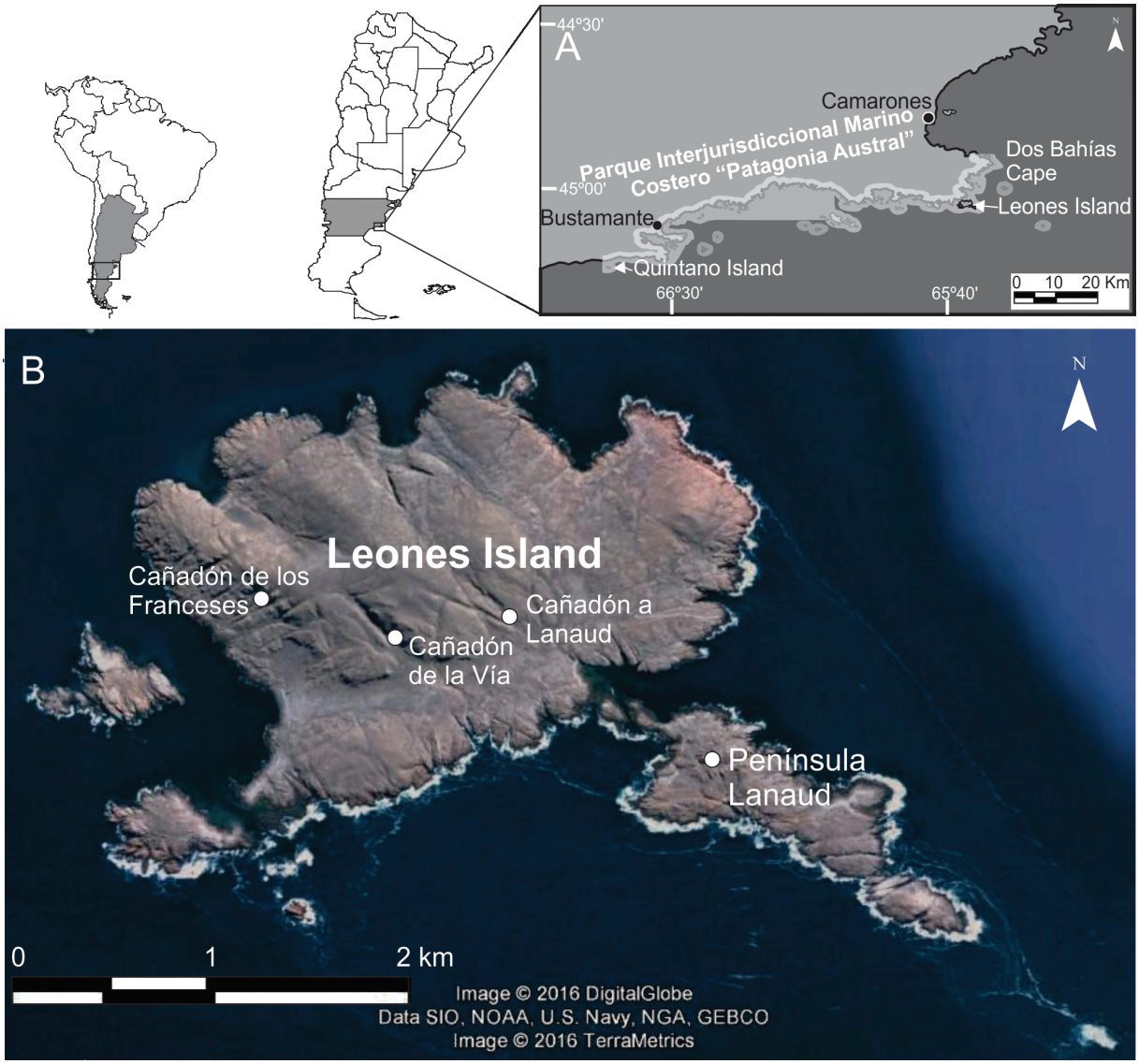

Figure 1. Location of the study area. A) Limits of Parque Interjurisdiccional Marino Costero Patagonia Austral and location of Leones Island, in Chubut province, Argentina; B) Satellite image of Leones Island and location of the studied breeding pairs of Magellanic Horned Owl (*Bubo magellanicus*).

Pellets were processed in laboratory following standard techniques (Bellocq 1982, Marti 1987) and preys were determined following reference collections of the *Instituto Patagónico para el Estudio de los Ecosistemas Continentales* and bibliography (Cheli et al. 2016, Udrizar Sauthier et al. 2017). Preys were identified to species level when possible and their relative frequencies were based on minimum number of individuals by counting homologous elements (Grayson 1973). The average weight of vertebrates and arthropods was derived from own records, but bibliographic records were used in the case of birds (Salvador 1988). The mean weight of prey items (MWP) was calculated as: ∑ (*wi Ni)/ Nt*, where *wi* is the mean weight of the prey item *i, Ni* is number of individuals of each prey item, and *Nt* is the total number of prey by locality (Jaksic & Marti 1981). For diet characterization, food niche breath (FNB) was calculated for each sample using the Levins' index (Levins 1968): FNB = $1/Pij^2$, where *Pij* is the proportion of the i^{th} prey category of species *j*. Due to the different availability of prey types among the sites, the standardized food-niche breadth (FNBs) was also calculated as follows: FNBs = (FNB – 1)/ (n – 1), where n is the number of prey categories (Levins 1968). Finally, the biomass percentage contributed by each prey item to the diet was also calculated (Marti 1987).

A total of 217 pellets plus disaggregated material were collected and 2774 prey individuals were identified (Table 1). Insects were the most consumed prey (63.6%), followed by reptiles (13.7%), arachnids (10.9%), mammals (10.4%), and birds (1.4%; Table 1). Most of the preys were nocturnal; the most consumed insects were the darkling beetles *Mitragenius araneiformis* and *Patagonogenius quadricollis*, and the scorpion *Bothriurus burmeisteri* was the only arachnid consumed. The most common prey reptile was the Darwin´s gecko (*Homonota darwini*), and

Table 1. Food items of the Magellanic Horned Owl (*Bubo magellanicus*) in Leones Island, Chubut province, Argentina. MNI = minimum number of individuals; FNB = food niche breadth, FNBs = standarized food niche breadth; MWP = mean weight of captured prey.

Class	Order	Family	Genus / species	MNI			
				Cañadón de la Vía	Península Lanaud	Cañadón de los Franceses	Cañadón a Lanaud
Insecta	Coleoptera	Tenebrionidae	*Scotobius akidioides*	4	6	9	6
			Plathestes sp.	2	1	5	0
			Emmallodera crenaticostata	68	12	24	99
			Hylithus tentyroides	0	1	2	17
			Patagonogenius quadricollis	90	23	102	275
			Mitragenius araneiformis	181	84	103	351
		Carabidae	*Cnemalobus* sp.	38	17	19	44
		Curculionidae	sp1	36	1	34	70
			sp2	1	6	1	0
			sp3	0	0	2	0
		Trogidae	sp1	0	2	6	0
		Scarabaeidae	sp1	2	1	13	5
Arachnida	Scorpiones	Bothriuridae	*Bothriurus burmeisteri*	116	60	23	104
Aves	Passeriformes		sp1	2	8	0	0
			sp2	1	0	0	0
			sp3	1	0	0	0
		Icteridae	sp1	0	1	0	0
		Emberizidae	sp1	0	4	2	5
	Charadriiformes	Laridae	*Sterna* sp.	0	13	1	0
Reptilia	Squamata	Gekkonidae	*Homonota darwinii*	109	108	8	152
		Liolaeminidae	*Liolaemus camarones*	1	1	0	2
Mammalia	Rodentia	Muridae	*Rattus norvegicus*	67	23	99	99
	Chiroptera	Vespertilionidae	*Histiotus montanus*	1	0	0	0
			Total	**720**	**372**	**453**	**1229**
			FNB	6.64	5.73	6.07	5.82
			FNBs	0.26	0.22	0.23	0.22
			MWP	17.4	23.29	39.57	15.08

among mammals, the exotic brown rat (*Rattus norvegicus*). The number of preys by locality ranged from 17 to 19. The preys that contributed the most to the biomass were, among vertebrates, *R. norvegicus* and terns (*Sterna* sp.), and among invertebrates (with a much lower contribution) *Mitragenius araneiformis*, *Bothriurus burmeisteri*, and *Patagonogenius quadricollis* (Table 1). Trophic niche breadth varied between 5.73 (Península Lanaud) and 6.64 (Cañadón de la Vía). The MWP ranged from 15.08 g (Cañadón a Lanaud) to 39.57 g (Cañadón de los Franceses).

As it has been previously shown, the Magellanic Horned Owl is a generalist predator that mainly feeds on small mammals, arthropods, birds, and reptiles, varying its diet according to localities and seasons (Yañez et al. 1978, Nabte et al. 2006, Formoso et al. 2012). In this study, the main preys were nocturnal, arthropods being the most consumed prey type (more than 70% of the preys). It is important to point out that this is the first contribution for *Bubo magellanicus* in Argentina reporting arthropods as the most consumed prey. This item is usually the second or third most consumed by these owls, the first being small and medium-sized mammals (Jaksic & Marti 1984, Donázar et al. 1997, Trejo & Grigera 1998, Donadío et al. 2009, Ortiz et al. 2010, Formoso et al. 2012). This high consumption of arthropods could be due to the isolation of the study area and the absence of the usual prey species on the island, especially native rodents (Udrizar Sauthier et al. 2017).

It is interesting to note that these raptors are feeding on six of the seven tenebrionid beetle species

present on the island (Cheli et al. 2016). We also report a high consumption of reptiles, being the second most consumed prey item in three of the four studied localities. Predation by *B. magellanicus* on birds (passerines and terns) seems rather occasional in the study area, except in Península Lanaud (Figure 1B, Table 1). Predation on seabirds such as terns by *B. magellanicus* has not previously been reported, although it was recorded for the Great Horned Owl (*Bubo virginianus*; Moore et al. 1999, Southern et al. 1982).

Regarding mammal consumption, two out of the three species present on the island (Udrizar Sauthier et al. 2017), i.e., common leaf-eared bat (*Histiotus montanus*) and brown rat, were preyed upon. No predation was recorded on the big hairy armadillo (*Chaetophractus villosus*), the third land mammal species that inhabits the island (Udrizar Sauthier et al. 2017). Bat consumption seems rather occasional because only one specimen was found (Cañadón de la Vía). On the other hand, predation on brown rats seems important as high numbers of preyed individuals were found at the four nesting sites (Table 1). This wild population of brown rats represents a potential risk for the conservation of the native species inhabiting the island, as has been shown for other insular regions of the world (Harris 2009, Harper & Bunbury 2015). On the island brown rats lack predators other than *B. magellanicus*. The presence of introduced species in the diet of this owl is remarkable for Argentine Patagonia as previous studies reported that predation on exotic prey items (including lagomorphs and murids) was rare (Donázar et al. 1997, Trejo & Grigera 1998, Trejo et al. 2005, Nabte et al. 2006, Formoso et al. 2012).

This contribution is the first analysis on the food habits of the Magellanic Horned Owl in an insular environment from the Argentinean Atlantic coast. The relevance of this study relies on that arthropods and introduced species were the main prey items registered, a fact that was not previously reported for this species in Patagonia. This suggests that the diet of this owl is mainly related to prey availability, and that hunting is exclusively restricted to the Leones Island, as the diet was only composed of prey inhabiting the island.

ACKNOWLEDGMENTS

We thank the rangers and employees of National Park Administration (G. Solveira, R. Amado, A. Serra, D. Fernández, A. Beati, O. Martínez, S. Rusak and C. Chehebar) for their help with field work and research permissions; Prefectura Naval Argentina, Secretaría de Turismo y Áreas Naturales Protegidas (J. Tolosano and V. Fratto), and M. E. Lizurume (CENPAT) for providing help in the logistics and research permissions. We also thank E. Kubish and I. Minoli for supplying body mass data of lizards; Municipalidad de Camarones for accommodation and facilities for lecture activities; NGO Planete Urgence (L. Giménez, M. Rizea, E. Pierre, A. Faurobert, L. Rachet, B. Bringues-Prando) and S. Sorroche for funding. Field work was supported by the government of Chubut province (Instituto Provincial de Investigaciones de los Recursos del Mar de la provincia del Chubut).

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