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FOOD HABITS OF GURNEY'S BUZZARD IN PRE-ANDEAN RANGES AND THE HIGH ANDEAN PLATEAU OF NORTHERNMOST CHILE

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ABSTRACT.—We examined 381 pellets that yielded 1764 prey items for Gurney's Buzzards (*Buteo poecilochrous*) at a pre-Andean (3600 m elevation, non-breeding season) and a high-Andean plateau site (4500 m elevation, breeding season) of northernmost Chile. We compared mammalian prey in the diet with mammals trapped in the field. Gurney's Buzzards preyed extensively on invertebrates (57 and 72% of items), but considering the invertebrates' small biomass, the buzzards likely relied on vertebrates (primarily on small mammals) as their staple prey. The number of small mammals in the diet versus that obtained in the field agreed better at the pre-Andean than at the high-Andean plateau site. Differences in diet between sites were apparently related to the seasons when the sampling occurred.

Hábitos alimentarios del aguilucho de la puna en la precordillera andina y el altiplano del extremo norte de Chile

EXTRACTO.—Examinamos 381 egagrópilas que rindieron 1764 presas del aguilucho de la puna (*Buteo poecilochrous*) en un sitio precordillerano (3600 m altura, estación no reproductiva) y en uno altiplánico (4500 m altura, estación reproductiva) del extremo norte de Chile. Comparamos la composición de mamíferos en la dieta con aquella obtenida por trampeos de terreno. El aguilucho de la puna predó extensamente sobre invertebrados (entre 57 y 71% de la dieta, numéricamente), pero considerando la pequeña biomasa de estos invertebrados, es más probable que el aguilucho dependiera más de los vertebrados (principalmente de los micromamiferos) como elementos estables de su dieta. La incidencia numérica de micromamíferos en la dieta versus la obtenida en el terreno se correspondió mejor en el sitio precordillerano que en el altiplánico. Las diferencias entre las dietas en los distintos sitios aparentemente se deben a las distintas estaciones del año en que se hicieron las colectas.

Gurney's, or Red-naped, Buzzard (*Buteo poecilochrous*), is a medium-sized (about 1000 g), high altitude buteo found along the Andean ranges from Colombia south to neighboring Chile, Argentina and Bolivia. In this extreme of its distribution, the Andean mountain ranges enclose a high-altitude plateau (>4000 m elevation). Little information exists on Gurney's Buzzard, the most recent being a description of its food habits in the high-Andean plateau of northernmost Chile (Jiménez and Jaksić 1990). These authors reported breeding season diet based on a sample of 27 pellets and 45 prey remains found in a nest. Here we document both breeding and non-breeding season diets of Gurney's Buzzard at two physiognomically and altitudinally different sites. We also compare mammalian prey with trapping results to estimate whether this raptor takes its mammalian prey in proportion to their estimated field abundance.

STUDY AREAS AND METHODS

At the pre-Andean locality of Patapatane (3600 m elevation, 18°05'S 69°43'W, 110 km E of Arica, Chile) we collected 229 fresh pellets below a cliff on 12 May 1990. This is autumn in the southern hemisphere, and consequently the pellet contents reveal non-breeding season diet of Gurney's Buzzard. To the best of our knowledge the

pellets belonged to this buzzard and not to the broadly sympatric but much scarcer Carunculated Caracara (*Phalcoboenus megalopterus*). We actually saw at least two different buzzards perching at the cliff or soaring above. We are not familiar with Carunculated Caracara pellets, but if those are similar to the pellets of the closely related Chimango Caracara (*Milvago chimango*; see Yáñez et al. 1982), then the pellets we collected were those of buteos and not of caracaras.

From 13 to 18 May 1990, for a total of 480 trap nights, we placed traps in two grids of 6 by 8 configuration, 15 m apart. We used Sherman traps 8 by 10 by 23 cm, set during 5 nights. Vegetation at this pre-Andean site was mixed. The shrub *Parastrephia lepidophylla* dominated on sandy soils on flat areas lacking a herbaceous plant layer. The dwarf shrubs *Fabiana* sp., *Chuquiraga rotundifolia*, and *Baccharis boliviensis* dominated on rocky slopes, where a scant cover of bunchgrasses (*Festuca* sp.) was also present.

At the high-Andean plateau, in Ancachalloane Valley (4500 m elevation, 18°10'S 69°20'W, 180 km E of Arica, Chile), we collected another sample of 152 fresh pellets below a cliff on 20 and 24 October 1989. This corresponds to the austral spring, and thus the beginning of the breeding season for local raptors. Again, we only saw Gurney's Buzzards in the area, and among the pellets we found molted feathers of this species, with the typical dark ochraceous coloration. Feathers of the broadly sympatric but rarely seen Carunculated Caracara are either white or black.

We did not sample small mammals at Ancachalloane Valley, but we did so in two neighboring and altitudinally, physiognomically and vegetationally similar sites. These were Tacora (4100 m elevation, 17°46'S 69°43'W, 156 km E of Arica, Chile) and Surire (4245 m elevation, 18°50'S 69°09'W, 200 km E of Arica, Chile). Between 10–15 January 1990 at Tacora, and between 24–29 January 1990 at Surire, we used two adjacent grids in each area as described above for a total of 480 trap nights in each. Vegetation at these high-Andean sites was dominated by dwarf shrubs of *Parastrephia lucida, P. lepidophylla* or *Baccharis santelices,* which grew together with bunchgrasses (*Festuca orthophylla*) interspersed with cushions of *Pycnophyllum molle, Azorella compacta, Werneria weddelli* and *W. aretioides.*

All pellets were labeled by locality and date, carefully teased apart and prey identified to species when possible using keys (Reise 1973) and museum specimens collected locally. The minimum number of individual prey present in the pellets was based on the number of known double or single anatomical elements such as crania, mandibles, teeth rows, beaks, feet, elytra, antennae and stings (Marti 1987). Mammalian nomenclature follows Honacki et al. (1982).

RESULTS AND DISCUSSION

Invertebrates (composed of insects mainly) accounted for 72 and 57% of prey individuals in the diet at the pre-Andean and at the high-Andean site, respectively. The lower incidence of insects at the latter site may be attributed to the pellets having been obtained in fall versus spring. The increased abundance of larger prey such as mammals during spring (F.M. Jaksić, pers. observation) may result in decreased predation on invertebrates. The same explanation may be offered for the lower incidence of reptiles at the high-Andean site. However, it is intriguing that the consumption pattern for amphibians went in the opposite direction. Mammals, and particularly birds, were more frequent as prey at the high-Andean site. Increased vulnerability of dispersing juvenile mammals, and of nesting birds during spring may account for their higher incidence as prey at this site.

At a finer level of resolution (Table 1), the most prevalent insect prey were curculionid and tenebrionid beetles. These were also the most abundant beetles at the two study sites (F.M. Jaksić, pers. observation). The hymenopterans found at the pre-Andean site were wasps, which were commonly seen there. Amphibians were found as prey only at the high-Andean site. These were Spiny Toads, the most terrestrial of the three species commonly found in the region (Jiménez and Jaksić 1990, F.M. Jaksić, pers. observation). The lizards found as prey at the two study sites were apparently iguanids in the genus *Liolaemus.* Three common *Liolaemus* species are found in the region (Jiménez and Jaksić 1990), but we could not separate them by species in our diet samples. That the relatively thermophilic snakes were only found among prey at the pre-Andean site speaks to the higher temperatures prevailing in that area (F.M. Jaksić, pers. observation). We could not identify avian prey to species; the Furnariidae could be any of the 10 species locally observed and the Fringillidae could be any of seven species (Jiménez and Jaksić 1990). It is interesting that 10 bird eggs were recorded among pellets at the high-Andean site, where pellets were collected during the breeding season. It had not previously been reported (Jiménez and Jaksić 1990) that Gurney's Buzzard raided bird nests. But it may well be that buzzards consume their own eggshells after their young hatch.

Before comparing mammalian composition in the buzzard's diet with that in the field, some cautionary notes must be stated. The traps used were not adequate for sampling the fossorial Puna Tucotuco, the large Mountain Viscacha, and the trap-shy Smoky Chinchilla-rat. In addition, the trapping grids were not properly placed for sampling the semicolonial Highland Cavy or Puna Cavy, which inhabit bogs. Except for the Smoky Chinchilla-rat, the

Table 1. Percent of prey in the diet of Gurney's Buzzard at pre-Andean ranges and at the high-Andean plateau. Subtotals for prey classes are in parentheses.

PREY CATEGORIES	PRE-ANDES		HIGH-ANDES	
	DIET	TRAPS	DIET	TRAPS
Mammals	(15.3)	(100.0)	(19.5)	(100.0)
Smoky Chinchilla-rat (*Abrocoma cinerea*)	0.3	0.0	0.3	0.0
White-bellied Field Mouse (*Akodon albiventer*)	0.3	31.3	0.0	43.0
Andean Field Mouse (*Akodon andinus*)	1.4	0.0	0.2	0.0
Field mice (*Akodon albiventer* or *A. andinus*)	1.6	0.0	1.2	0.0
Shrub Andean-rat (*Andinomys edax*)	0.1	0.0	0.0	0.0
Bolivian Greater Mouse (*Auliscomys boliviensis*)	0.1	0.0	0.2	0.0
Andean Vesper-mouse (*Calomys lepidus*)	0.0	0.0	0.0	5.1
Puna Tucotuco (*Ctenomys opimus*)	0.0	0.0	3.1	0.0
Silky-foot Mouse (*Eligmodontia typus*)	1.4	6.2	0.7	35.4
Highland Cavy (*Galea musteloides*) or Puna Cavy (*Microcavia niata*)	0.1	0.0	0.5	0.0
Mountain Viscacha (*Lagidium viscacia*)	0.1	0.0	0.5	0.0
Darwin's Leaf-eared Mouse (*Phyllotis darwini*)	3.8	62.5	1.5	16.5
Cricetidae: unidentified	4.2	0.0	5.0	0.0
Rodentia: unidentified	1.9	0.0	6.3	0.0
Birds	(0.4)		(7.2)	
Furnariidae	0.1		0.0	
Fringillidae	0.0		0.3	
Passeriformes: unidentified	0.2		0.7	
Aves: unidentified	0.1		4.5	
Bird egg: unidentified	0.0		1.7	
Reptiles	(12.7)		(8.1)	
Long-tailed snake (*Philodryas chamissonis*)	2.8		0.0	
Iguanidae	9.9		8.1	
Amphibians	(0.0)		(8.1)	
Spiny Toad (*Bufo spinulosus*)	0.0		8.1	
Insects	(69.9)		(56.2)	
Buprestidae	0.4		0.3	
Carabidae	0.1		0.3	
Curculionidae	31.9		18.9	
Scarabaeidae	2.5		6.3	
Tenebrionidae	22.7		18.4	
Coleoptera: unidentified	1.9		11.1	
Hymenoptera	9.8		0.0	
Orthoptera	0.3		0.0	
Insect larva: unidentified	0.0		0.9	
Insect adult: unidentified	0.3		0.0	
Arachnids	(1.7)		(0.9)	
Aranea	0.1		0.0	
Scorpionida	1.6		0.9	
Total prey/captures	1181	16	583	79
Total pellets/trap-nights	229	480	152	960

presence of the remaining four rodents was evident from sightings and field marks, particularly at the high-Andean site.

At the pre-Andean site, Darwin's Leaf-eared Mouse was taken about in the proportion expected from their relatively high abundance estimated by trapping (Table 1). The White-bellied Field Mouse was taken by the buzzards less than expected, and the Silky-foot Mouse more than expected, from their respective field abundances (Table 1). The remaining mammalian species in the diet that were not trapped (disregarding unidentified species) represented less than 4% of the prey taken by the buzzards. Results from the high-Andean site were more disparate. Both the most (White-bellied Field Mouse) and least frequently trapped species (Andean Vesper-mouse) were not found at all among pellets. The Silky-foot Mouse was preyed upon below, and the Darwin's Leaf-eared Mouse above, their estimated abundances in the field (Table 1). The mammalian species not trapped (disregarding unidentified species) accounted for only 6% of the buzzards' diet.

In comparison to the breeding season diet, reported by Jiménez and Jaksić (1990) for Gurney's Buzzards at a high-Andean site close to ours, our current data indicate fewer arthropods (57 vs. 80%), more mammals (20 vs. 8%), amphibians (8 vs. 0%) and birds (7 vs. 4%), and about the same proportion of reptiles (8%). The same four mammalian prey species (Andean Field Mouse, Darwin's Leaf-eared Mouse, Tschudi's Cavy, and Puna Tucotuco) were reported by Jiménez and Jaksić (1990), but we did not find White-bellied Field Mouse as prey although it was trapped. We detected four additional prey species: Smoky Chinchilla-rat, Bolivian Greater Mouse, Silky-foot Mouse, and Mountain Viscacha. This is not surprising, as our sample size for pellets was almost six times larger than that reported by Jiménez and Jaksić (1990).

In conclusion, Gurney's Buzzard in northernmost Chile preys extensively on insects, but considering this prey's small biomass, it may be said to rely on vertebrates as its staple prey. Most differences in prey composition between the two sites studied apparently were the result of the different seasons when the sampling took place.

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