Diet of Ornate Hawk-Eagle (*Spizaetus ornatus*)

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ABSTRACT: The Ornate Hawk-Eagle (*Spizaetus ornatus*) is a top predator and inhabits mainly preserved forests. It occurs from Mexico to Argentina and throughout Brazil, where it is threatened by extinction. It hunts birds, mammals and reptiles, picking up both on the ground and on the branches in the forest. Here we report data on a pair and one young individual of this species registered in the southeast of Minas Gerais state, eastern portion of the Espinhaço Range, Brazil. In addition, a literature review on the diet of the species was carried out aiming gather data on food habits. The nesting territory, as well as the nest was discovered in semi-deciduous seasonal forest area. We recorded predation of a Lesser Yellow-headed Vulture (*Cathartes burrovianus*) by the young. After two days of observation, the nest was overturned, what allowed its screening for other food items discovered after analysis of some feathers and bones. Detailed records of predation of *S. ornatus* were non-existent or inaccurate. Taking together our own field observation and the literature review, we found 121 taxa consumed by *S. ornatus*. A total of 78 bird species were reported, mainly Galliformes, followed by medium-sized mammals (38 species), well represented by Rodentia and Primates.

KEY-WORDS: birds of prey, diet, nesting, predation, review.

INTRODUCTION

The Ornate Hawk-Eagle *Spizaetus ornatus* is a large and imposing bird of prey from the family Accipitridae. The species’ size ranges from 56 to 68.5 cm in length (Howell & Webb 1995) and 820 to 1272 g in body mass (Dunning-Jr. 2008). Ornate Hawk-Eagle occurs in rainforest, wetlands, riparian forests, seasonally deciduous and semi-deciduous forests, up to elevations of ~1800 m a.s.l. (Íñigo et al. 1987, del Hoyo et al. 1994, Ferguson-Lees & Christie 2001). Ornate Hawk-Eagle has a wide distribution, from Mexico to the northern of Argentina and Paraguay, including all Brazil (Ferguson-Lees & Christie 2001), but it is considered rare throughout its range, mainly in southern populations such as in northern Argentina and south-southeastern Brazil (Márquez et al. 2000).

Observations of birds of prey, like the large Ornate Hawk-Eagle, are difficult to get because of the low densities, shy behavior and closed forest preferences (Bibby et al. 1992). For these reasons, basic information of its life history is still poorly known (Robinson 1994, Naveda-Rodríguez 2004).

Despite Ornate Hawk-Eagle is often found in forest fragment edges and even in open degraded areas (Ferguson-Lees & Christie 2001) it needs preserved habitats for breeding (Lyon & Kuhnigk 1985). The combination of habitat loss and low breeding rate has been threatening of extinction this species, with the populations decreasing throughout its occurrence area (Márquez et al. 2000). It is not a surprise that Ornate Hawk-Eagle is globally “Near Threatened” (BirdLife International 2016), and has been listed as threatened in several locations, such as Paraguay (del Castillo & Clay 2005). In Brazil, *S. ornatus* is “Critically Endangered” in the states of Rio Grande do Sul (Rio Grande do Sul 2014), São Paulo (Silveira et al. 2009), Espírito Santo (Simon et al. 2007) and Santa Catarina (CONSEMA 2011), and “Endangered” in Paraná (Mikich & Bérnils 2004), Rio de Janeiro (Alves et al. 2000) and Minas Gerais (Copam 2010).

The overall negative impacts of habitat changes in the distribution and in the reproduction of the species also affect feeding behavior. It is known that Ornate Hawk-Eagle hunts its prey in roosts on dense vegetation, including the edge and the interior of forests patches (Robinson 1994). Ornate Hawk-Eagle has fast flying attack to reach and capture the prey both in trees and on the ground (Trail 1987, Ferguson-Lees & Christie 2001). Prey include bird flocks such as egrets in nesting colonies (Hilty 2003), birds that feed in flocks (Kilham 1978, Robinson 1994), groups of birds in reproductive display such as Guianan Cock-of-the-Rock (*Rupicola rupicola*), and also mammals such as monkey groups (Hilty 2003). The literature shows that most of the food items of *S.
ornatus consists of medium-sized mammals and large birds, which are frequently missing in forest due to the defaunation caused by human-induced fragmentation (Kurten 2013); and less frequently, reptiles (Klein et al 1988). However, the published data is scarce and there are few studies with more detailed data (e.g., Lyon & Kuhnigk 1985 and Madrid et al. 1992 in Guatemala, Klein et al. 1988 in Brazil, Clinton-Eitniear et al. 1991 in Belize, and Robinson 1994 in Peru). Understanding the diet of S. ornatus allow us to better planning actions for Ornate Hawk-Eagle conservation.

This study shows a new predation record by a young S. ornatus observed at the field. In addition, a data set was collected from the nest of Ornate Hawk-Eagle. Finally, we reviewed dietary records from published articles and unpublished data shared between researchers about Ornate Hawk-Eagle.

METHODS
Field observations

Observations and recordings were carried out in the Conceição do Mato Dentro, southeast Minas Gerais state, Brazil. The area is inserted in an ecotone between areas of Atlantic Forest and Cerrado Domains, located in the eastern portion of the Espinhaço Range (18°54.584'S; 43°25.596'W). The Atlantic Forest and the Cerrado are considered hotspots of biodiversity (Mittermeier et al. 2004), reflected in bird diversity, which have the highest number of threatened (54 species in the Atlantic Forest and 14 in the Cerrado) (Marini & Garcia 2005) and endemic species in Brazil (223 species in the Atlantic Forest and 29 in the Cerrado region) (Silva 1997).

Observations were carried out in semi-deciduous riparian forest areas and rocky outcrops at 816 m altitude. Because of the recent fragmentation, the area is a mosaic between forest fragments and open areas. On 07 April 2016, we observed a young S. ornatus resting on the ground in an open area, near the forest remnant. Two days later, an individual with adult plumage was found flying in thermals. Since then, those individuals were monitored to identify prey captured by the species. Through observations and monitoring the young S. ornatus, we discovered, at the same month, the nest between thick forks of Jatobá tree (Hymenaea courbaril) approximately 25 m height and about 300 m from the predation site.

On 01 June 2016 the tree nest was cut down (properly authorized by the competent organs), and we collected the nest with its content. At this moment the young had already abandoned the nest and its withdrawal could be done without causing direct damage to the birds. All biological material contained in the nest (bones and feathers) was screened and identified with the help of specialists from the Natural History Museum of the Catholic University of Minas Gerais.

Literature review

To review the available information of the diet of Ornate Hawk-Eagle, we consulted scientific articles (searched in Web of Science, Scirus, JSTOR and Scielo), unpublished information, and photographs from citizen science web-pages (e.g., http://www.wikiaves.com.br/, http://ibc.lynxeds.com/, http://www.ebird.org). In these cases, authors were contacted to confirm information.

RESULTS
Field observation

On 07 April 2016, a young of S. ornatus was observed among the branches of a cut tree on the floor feeding an adult Lesser Yellow-headed Vulture (Cathartes burrovianus) (Fig. 1). On the next day the same bird was observed again feeding on the carcass in the same place, consuming all flesh and bones, leaving feathers.

In the following days, new predation records were observed. The same young was observed feeding on the rest of a mammal and at least two small birds at the same location of the previous record. However, it was not possible to identify species. In these latter cases the bird was feeding in the forest edge, between canopy branches.

The nest material collected revealed a higher consumption of birds. Five species of birds were identified by feather remains (Penelope sp., Trogon surrucura, Patoioenas picazuro, Hydropalpis albicollis, Piaja cayana and Strigidae). In addition, two jaws and one pelvic

Figure 1. Ornate Hawk-Eagle (Spizaetus ornatus) eating a Lesser Yellow-headed Vulture (Cathartes burrovianus) in 07 April 2016, in Conceição do Mato Dentro, southeast of Minas Gerais, Brazil. Photo author: Michele A. Ferreira.
bone were identified, both attributed to two individuals, one adult and one juvenile of Paraguayan Hairy Dwarf Porcupine (*Coendou spinosus*).

**Literature review**

We gathered 23 papers, ten books, five records of unpublished information and photographs from citizen science and one conference abstract with some information on the species' diet. Most data were from observations of carcasses taken from nest, while other provided information about attacks and attempted predation events.

Taking together our own field observation and the literature review, we found 121 taxa consumed by *S. ornatus* (Table 1). The largest number of species (78 species) was birds, mainly Galliformes, followed by medium-sized mammals (38 species), well represented by Rodentia and Primates. Among the Squamata, there are few records of predation on *Iguana iguana* and some unidentified snakes and lizards.

### Table 1. Food items consumed by *Spizaetus ornatus* based in a literature review and based in the nest material from Minas Gerais, Brazil (current study).

| Class/Order | Family      | Species                        | Common name          | Reference                          |
|-------------|-------------|--------------------------------|----------------------|------------------------------------|
| Aves        | Tinamidae   | *Crypturellus boucardi*         | Slaty-breasted Tinamou | Whitacre et al. 2012               |
|             |             | *Crypturellus cinamomeus*       | Eastern Thicket Tinamou | Whitacre et al. 2012               |
|             |             | *Crypturellus obsoletus*        | Brown Tinamou        | Joenck et al. 2011                 |
|             |             | *Crypturellus parvirostris*     | Small-billed Tinamou | Greco et al. 2004                  |
|             |             | *Crypturellus soui*             | Little Tinamou       | Flatten et al. 1989, Whitacre et al. 2012 |
|             |             | *Crypturellus sp.*              | Tinamou              | Klein et al. 1988                  |
|             |             | *Crypturellus sp.*              | Tinamou              | Madrid et al. 1991, 1992           |
|             |             | *Tinamus major*                 | Great Tinamou        | Flatten et al. 1989, Madrid et al. 1991, 1992, Whitacre et al. 2012 |
|             |             | *Tinamus sp.*                   | Tinamou              | Klein et al. 1988                  |
|             |             | (major or guttatus)             |                      |                                    |
|             |             | unidentified Tinamou            | Tinamou              | Lyon & Kuhnik 1985                 |
| Anseriformes| Anatidae    | *Amazonetta brasiliensis*       | Brazilian Teal       | Greco et al. 2004                  |
| Galliformes | Cracidae    | *Crau rubra*                    | Great Curassow       | Russell 1964, Flatten et al. 1989, Madrid et al. 1992, Phillips & Hatten 2013, Whitacre et al. 2012 |
|             |             | *Oreophasis derbianus*          | Horned Guan          | Gómez-de-Silva 2006                |
|             |             | *Oreptalis garrula*             | Chestnut-winged Chachalaca | Olrog 1985                        |
|             |             | *Ortalis guttata*               | Speckled Chachalaca  | Sigrist 2006                       |
|             |             | *Ortalis motmot*                | Little Chachalaca    | Klein et al. 1988                  |
|             |             | *Ortalis ruficauda*             | Rufous-vented Chachalaca | Friedmann & Smith-Jr. 1955       |
|             |             | *Ortalis setula*                | Plain Chachalaca     | Lyon & Kuhnik 1985, Flatten et al. 1989, Madrid et al. 1991, 1992, Whitacre et al. 2012 |
|             |             | *Penelope obscura*              | Dusky-legged Guan    | Joenck et al. 2011                 |

**DISCUSSION**

### Field observations

The young *S. ornatus* seems to feed on a dead individual, since no traces of predation were observed. Jones & Dorward (2014) recorded the “interaction” between *S. ornatus* and a bovine femur and suggested that the species may present scavenging behavior. However, since the young bird was observed again feeding on the carcass in the consecutive days, it is possible that the vulture was captured before the first record. This would explain the absence of traces of recent predation regarding that return-hunting behavior is rare among birds of prey (e.g., Springer et al. 2011, Whitacre et al. 2012).

Detailed records of predation of *S. ornatus* are nonexistent or inaccurate. Stiles & Skutch (1989) have already mentioned that the species “catches birds up size of guans or vulture”, and Sigrist (2006) mention that they “catch macaws, parrots, vultures, *Coragyps atratus*”. However, those authors did not provided details, probably referring...
| Class/Order | Family | Species | Common name | Reference |
|-------------|--------|---------|-------------|-----------|
| Piciformes  | Ramphastidae | Aulacorhynchus prasinus | Emerald Toucan | Abadia & Navarro 2011, Whitacre et al. 2012, Monroy-Ojeda et al. 2014 |
|             |                    | Pteroglossus castanotis | Chestnut-eared Araçari | Leonardo Lopes pers. comm. |
|             |                    | Pteroglossus torquatus | Collared Araçari | Madrid et al. 1991, Phillips & Hatten 2013, Whitacre et al. 2012 |
|             |                    | Ramphastos curvieri | Cuvier’s Toucan | Giudice 2007 |
|             |                    | Ramphastos sulfuratus | Keel-billed Toucan | Flatten et al. 1989, Madrid et al. 1991, 1992, Phillips & Hatten 2013, Whitacre et al. 2012 |
|             |                    | Ramphastos vitellinus | Channel-billed Toucan | Klein et al. 1988 |
|             |                    | Columbidae (Columba, Leptotilla, or Geotrygon) | Pigeons and Doves | Whitacre et al. 2012 |
|            |                    | Geotrygon montana | Ruddy Quail-Dove | Whitacre et al. 2012 |
|            |                    | Leptotilla plumbeiceps | Grey-headed Dove | Lyon & Kuhnigk 1985 |
|            |                    | Leptotilla rufaxilla | Grey-fronted Dove | Joenck et al. 2011 |
|            |                    | Leptotilla verreauxi | White-tipped Dove | Greco et al. 2004 |
|            |                    | Patagioenas picazuro | Picazuro Pigeon | Greco et al. 2004, this study |
|            |                    | Patagioenas speciosa | Scaled Pigeon | Whitacre et al. 2012 |
|              |                    | Columbidae | Pigeons | Plattet al. 1989, Madrid et al. 1991, 1992 |
|            |                    | Columba sp. | Pigeons | Whitacre et al. 2012 |
|            |                    | Leptotilla quiscalis var. torquata | Grey-necked Wood-rail | Robinson 1994, Whitacre et al. 2012 |
|            |                    | Gallinula chloropus | Common Moorhen | Greco et al. 2004 |
|            |                    | Porphyrio martinicus | Purple Gallinule | Robinson 1994 |
|            |                    | Columbidae | Blackbird | Madrid et al. 1991, 1992, Phillips & Hatten 2013, Whitacre et al. 2012 |
|             |                    | Anhinga anhinga | Anhinga | Greco et al. 2004 |
|             |                    | Piciformes | Piciformes | Piciformes |
|             |                    | Cuculiformes | Cuculidae | Cuculidae |
|             |                    | Opisthocomiformes | Opisthocomidae | Opisthocomidae |
|             |                    | Caprimulgiformes | Caprimulgidae | Caprimulgidae |
|             |                    | Trogoniformes | Trogonidae | Trogonidae |
|             |                    | Coraciiformes | Alcedinidae | Alcedinidae |
|             |                    | Strigiformes | Strigidae | Strigidae |
|             |                    | Podicipediformes | Podicipedidae | Podicipedidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
|             |                    | Rallidae | Rallidae | Rallidae |
|             |                    | Phasianidae | Phasianidae | Phasianidae |
|             |                    | Sulfuriformes | Sulfuriformes | Sulfuriformes |
|             |                    | Anhingidae | Anhingidae | Anhingidae |
|             |                    | Pelecaniformes | Pelecanidae | Pelecanidae |
|             |                    | Cathartiformes | Cathartidae | Cathartidae |
|             |                    | Gruiformes | Psophiidae | Psophiidae |
| Class/Order | Family | Species | Common name | Reference |
|-------------|--------|---------|-------------|-----------|
| Picidae     | Campephilus guatemalensis | Pale-billed Woodpecker | Whitacre et al. 2012 |
|             | Melanerpes sp. | Woodpecker | Madrid et al. 1991 |
| Psittaciformes | Psittacidae | Amazona autumnalis | Red-lored Amazon | Whitacre et al. 2012 |
|             | Amazona farinosa | Southern Mealy Amazon | Whitacre et al. 2012 |
|             | Amazona sp. (cf. ararafront) | Probably White-fronted Amazon | Whitacre et al. 2012 |
|             | Ara macao | Scarlet Macaw | Klein et al. 1988 |
|             | Ara sp. | Macaw | Robinson 1994 |
|             | Ara sp. (cf. Ortalopopitaca manilatus) | Red-bellied Macaw | Klein et al. 1988 |
|             | Pionus sp. | Parakeet | Robinson 1994 |
|             | Pionus sp. | Parrot | Naveda-Rodriguez 2004 |
|             | Psittacidae (Pionus or Pionopitaca) | Parrot | Whitacre et al. 2012 |
| Passeriformes | Bombycillidae | Phlegonyx caudatus | Long-tailed Silky-Flycatcher | Acosta-Chaves et al. 2012 |
|             | Rupicola rupicola | Guianan Cock-of-the-Rock | Traill 1987 |
|             | Tyrannidae | Tyrannus melancholicus | Tropical Kingbird | Souza 2013 |
|             | Corvidae | Cyanocorax cyanopogon | White-naped Jay | Luiz Trinchão pers. comm. |
|             |            | Psilorhinus morio | Brown Jay | Whitacre et al. 2012, Flatten et al. 1989, Madrid et al. 1992 |
|             | Icteridae | Cacicus cela | Yellow-rumped Cacique | Robinson 1994 |
|             |            | Dives dives | Melodious Blackbird | Whitacre et al. 2012 |
|             | Icteridae | Psarocolius montezuma | Montezuma Oropendola | Whitacre et al. 2012 |
|             | Undetermined | Probably Quiscalus mexicans or Crotophaga sulcirostris | Great-tailed Grackle or Groove-billed Ani | Whitacre et al. 2012 |
| Mammalia    | Carnivora | Procyonidae | Nasua narica | White-nosed Coati | Madrid et al. 1991, 1992, Abadia & Navarro 2011, Whitacre et al. 2012 |
|             | Chiroptera | Phyllostomidae | Artibeus jamaicensis | Jamaican Fruit-eating Bat | Whitacre et al. 2012 |
|             |            | Artibeus sp. | Fruit-eating Bat | Whitacre et al. 2012 |
|             |            | Unidentified Bats | Bat | Lyon & Kuhnigk 1985 |
|             | Undetermined | Unidentified Bats | Bat | Madrid et al. 1991 |
|             |            | Unidentified Bats | Bat | Lyon & Kuhnigk 1985, Madrid et al. 1992 |
|             | Didelphimorphia | Didelphidae | Caluromys derbianus | Central American Woolly Opossum | Madrid et al. 1992 |
|             |            | Didelphis marsupialis | Common Opossum | Klein et al. 1988 |
|             |            | Didelphis sp. | Opossum | Abadia & Navarro 2011 |
|             |            | Marmosa mexicana | Mexican Mouse Opossum | Whitacre et al. 2012 |
|             |            | Metachirus nudicaudatus | Brown Four-eyed Opossum | Klein et al. 1988 |
|             |            | Philander frenatus | Southeastern Four-eyed Opossum | Greco et al. 2004 |
| Lagomorpha  | Leporidae | Sylvilagus brasiliensis | Tapeti | Greco et al. 2004 |
| Pilosa      | Cyclopedidae | Cyclops didactylus | Silky Anteater | Giudice 2007 |
|             | Myrmecophagidae | Tamandua mexicana | Northern Tamandua | Abadia & Navarro 2011 |
to Dickey & van Rossem (1938), who, after dissecting the stomach of an adult *S. ornatus*, found rests of a monkey and fresh meat. Studying the area, the authors found a primate carcass near a Black-Vulture (*Coragyps atratus*) with back parts eaten. The authors then inferred that the vulture was killed by the eagle and partially eaten while feeding on the carcass of the monkey already killed a few days ago.

Among the collected material from the nest, only *Penelope* was found, species as large as the New World vultures (Dunning-Jr. 2008). The lack of other large bird species could be because *S. ornatus* does not carry large prey, eating them directly on the ground (Whitacre *et al.* 2012). Thus, to the best of our knowledge, vulture could be considerate an unusual prey of the Ornate Hawk-Eagle and eating the carcass suggests food habitat changes.

### Literature review and collected nest information

Ornate Hawk-Eagle is considered an opportunistic predator, capturing prey according to availability in the environment (Clinton-Eitniear *et al.* 1991). However,
in Guatemala, even in areas where large lizards are abundant, during seven years of study, there were no cases of predation of these species, indicating that *S. ornatus* is more specialist than thought (Whitacre et al. 2012).

In Manaus, Brazil, the consumption of 45 different prey was observed, of which 63.3% were identified as birds, 32.7% were mammals and only 4.1% were reptiles (Klein et al. 1988). Madrid et al. (1992) observed 83 prey in six nests, 38.5% mammals and 38.5% birds. In Guatemala, among 52 prey observed 40.4% were birds, 46.1% were mammals and 13.5% were not identified (Flatten et al. 1989). The same authors observed a different proportion of prey items in the diet of Ornate Hawk-Eagle years later: of the 325 items identified, 56.3% were birds (69.8% of the biomass) and 43.7% were mammals (30.2% of the biomass) (Whitacre et al. 2012). Among the items consumed, a predominance of large birds and medium-sized mammals was observed. Among birds, the most captured species was Cracidae (genus *Ortalis* and *Penelope*), Tinamidae and Ramphastidae (*Ramphastos*); among mammals, the medium rodents (*Sciurus* and *Dasypodidae*) predominated (Klein et al. 1988, Whitacre et al. 2012).

The preference by large birds and medium-sized mammals needs more attention. Deforestation could have indirect effects on Ornate Hawk-Eagle food diet, like the feeding of domestic animals such as chickens (Friedmann & Smith-Jr. 1955, Ffrench 1991, Robinson 1994).

It should be noted, however, that most reports on predation were from carcasses found in the nest. Thus, large prey consumed in the soil or small animals are possibly underestimated. According to Bednarz (1988), diet records based in nest material are biased towards larger prey items because smaller items are more likely to be distorted or fragmented beyond recognition, and are more difficult to find than larger bones.

The knowledge about the ecological behavior of this species is still scarce. In recent years the Ornate Hawk-Eagle populations have been declining in several places throughout its distribution (BirdLife International 2016). Among the species of *Spizaetus* genus, *S. ornatus* is one of the most affected by habitat losses and hunting leading to local extinctions (Canuto 2008). For Ornate Hawk-Eagle, conservation efforts should take into account food items used by birds. As demonstrated in the present survey, detailed records are non-existent or inaccurate and careful must be taken when using this information.

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