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Ethno-ornithological notes and neglected references on the Harpy Eagle *Harpia harpyja* in western Venezuela

Ángel L. Viloria, Manuel Lizarralde, P. Alexander Blanco & Christopher J. Sharpe

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Summary.—Harpy Eagle *Harpia harpyja* has been documented only recently (2004) in the Lake Maracaibo basin of western Venezuela, specifically in the central Sierra de Perijá, at 1,100 m. Observations in the southern plains of the basin are reported from heretofore neglected sources published in 1599, 1889 and 1893. Two overlooked photographs of dead birds dating from 1947–51 (Perijá Mountains) and 1959 (Santa Bárbara del Zulia) are reproduced. Several other records are established (in 1974, the 1980s, 1994/95, 2002 and 2006), based on empirical observations and material evidence collected by anthropologists who have visited the still heavily forested area inhabited by the Barí people since the early 1960s. Circumstantial evidence of the use of Harpy Eagle bones and feathers by the indigenous Barí provides additional ethno-ornithological information. Although Harpy Eagle is currently categorised as Vulnerable in Venezuela, the cumulative historical evidence coupled with Species Distribution Modelling analysis predictions of suitable habitat locally available to the species suggests it might still be frequent in the western and southern Lake Maracaibo basin, where considerable expanses of tropical forest are conserved within four major protected areas and an indigenous reserve.

'*Griffons I have never felt to exist, although in the land of Veneçuela they vouchsafe that, in ancient times, one followed a man who was hunting on horseback, who approached it to see what it was, and as he drew close, it threw itself suddenly over him, and when he recognised it he fled with his horse, and it followed him half flying, up to a river into which this man threw himself with his horse, swimming, and the Griffon remained on the shore; and telling of this case he gave the natural features of a Griffon*' (Vargas Machuca 1599: 154; translated by ALV & CJS)

This ancient Spanish chronicle referring to an encounter with a 'griffon' in the 'land of Veneçuela' has a claim to be the earliest record in the country of Harpy Eagle *Harpia harpyja*. This assumption of identity can be supported on environmental and behavioural grounds: first, the anecdote probably occurred in the lowlands, where rivers are of sufficient width and depth for a horse to swim through. A bird of similar imposing size, like Andean Condor *Vultur gryphus*, could not have been the subject, as it almost exclusively inhabits the high Andes (Fjeldså & Krabbe 1990). Second, the horseman was attacked and followed by the animal, and managed to get a close enough look at the bird to 'recognise it', which is not easily achieved with most of the largest Neotropical raptors, except *Harpia harpyja*, whose lack of wariness around humans is proverbial and has long been known to attack people (e.g., Linnaeus 1758, Rettig 1978). In contrast, another very large, rather similar and partially sympatric raptor, the Crested Eagle *Morphnus guianensis* does not share this behaviour. This allegedly makes Harpies easy and irresistible targets for hunters, who are considered the main cause of the current decline (Álvarez-Cordero 1996, Stattersfield & Capper 2000, Hilty

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2003, Trinca *et al*. 2008, Bierregaard *et al*. 2015, BirdLife International 2017, Schulenberg 2020).

If correctly interpreted, the record is especially interesting, for it illustrates the mythological dimension that Europeans afforded animal species in the Americas that lacked equivalent to any commonly found in the Old World. Furthermore, the historical context to this incident raises interesting zoogeographical questions, as four centuries ago the name 'Veneçuela' was applied to a province today represented by central and western parts of Venezuelan territory, a region where modern records of the species are very scarce and hitherto rather local.

Harpy Eagle, the largest Neotropical accipitrid and the world's most powerful bird of prey, occurs from southern Mexico to extreme north-east Argentina and southern Brazil (Rettig 1977, Hilty & Brown 1986, Sick 1988, Álvarez-Cordero 1996, Bierregaard *et al*. 2015, Schulenberg 2020). The species is distributed in lowland tropical forests, usually below 800 m, with a handful of documented sightings to 1,700 m (Bierregaard *et al*. 2015, Dove *et al*. 2018), including a previous record in Venezuela at 1,100 m (Ascanio & León 2004, Ascanio *et al*. 2017; see below). Some early records for Venezuela are from Bolívar state (Kavanayén and Salto Pará) and the north Coastal Range (Cumbre de Valencia, Rancho Grande, Caracas and río Chico) (Röhl 1956, Phelps & Phelps 1958, Meyer de Schauensee & Phelps 1978, Phelps & Meyer de Schauensee 1979). The rare presence of the species in the latter region has recently been confirmed (Ascanio *et al*. 2017, eBird 2020). Later, radio-tracking and sight records of Harpy Eagles have come from north of the Orinoco River in the Interior Range in Guatopo (Vargas *et al*. 2006), the *llanos* (Gómez Carredano 1994) and Caño Colorado (Redman 2008, Urbani *et al*. 2012). South of the Orinoco the species is widely distributed in Bolívar, Amazonas and the Orinoco Delta (Álvarez-Cordero *et al*. 1996, Lentino & Colvée 1998, Hilty 2003, Blanco 2009, Ascanio *et al*. 2017, eBird 2020).

Most comprehensive and recent ornithological works, to the start of the 21st century, do not mention the species for western Venezuela and adjacent Colombia (Hilty & Brown 1986, 2000, Hilty 2003), and none has provided documented records (Restall *et al*. 2006).

Distributional records given by Röhl (1956) relied mainly upon historical sightings by foreign travellers in Venezuela, such as Schomburgk (1840) and Appun (1871). A detailed scrutiny of both accounts reveals that Appun did obtain two old, stuffed specimens of Harpy Eagle from inhabitants of the village of San Esteban, in the foothills of the Coastal Range.

Röhl, an outstanding scholar of Venezuelan natural history, was interested in the contributions of European naturalists and travellers in Venezuela, particularly Germans (Röhl 1948). Despite his deep knowledge of the scientific work of Anton Goering (1836–1905), Röhl apparently failed to document (or rejected) Goering's observations concerning the presence of Harpy Eagle in the lowlands of the southern Lake Maracaibo basin. This news first appeared in the relatively obscure cultural magazine, *El Zulia Ilustrado*: 'Needless to say, raptors abound in that region, and during our journey we had occasion to witness their deadly fights. We even managed to see the largest of all, called the Harpy, which establishes its dwelling in the highest crowns of the trees of the virgin jungle, whence it probably lies in wait for a sloth…' (Goering 1889: 42). Goering's first report was cited the same year in an illustrated article devoted to the species (Fig. 1): 'Although it is not common, this bird also is found in the vast forests of Zulia; the German traveller Goering talks about it…', '…an individual captured in the headwaters of one of our great rivers can be seen in the menagerie in the beautiful house of Mr. C. Witzke, Consul of Denmark in this city [= Maracaibo]' (López-Rivas 1889: 108). On a second occasion Goering referred to an alleged Harpy Eagle in the forests of Onía, near Caño del Padre (1893: 26, 1962: 68): 'before dawn, I

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Figure 1. Engraving by an unknown artist, illustrating an article by Eduardo López Rivas about an encounter with a Harpy Eagle *Harpia harpyja* in western Venezuela (from *El Zulia Ilustrado*, Maracaibo 1889). The specimen depicted might represent a juvenile Harpy Eagle or possibly that of a Crested Eagle *Morphnus guianensis*, a species also found in the region.

saw in the heights, describing circles in the air, a *Harpya destructor* [*sic*], the most powerful eagle of South America. This majestic bird that surpasses our Royal Eagle [= Golden Eagle *Aquila chrysaetos*] in size, first seemed to me to be sighting a prey; however it later dropped, perching on a bare branch of a gigantic tree; I took advantage of the fortunate moment to observe as I pleased with my field glasses as if it were in front of me, its position and movements. Not long afterwards it lifted off again and disappeared in the thick vegetation'. In this case the behaviour described does not fully accord with that of Harpy Eagle. Goering perhaps misidentified a Crested Eagle, another very large predator, which does routinely soar and has a similar juvenile plumage. It is even rarer in the Lake Maracaibo basin, having only been documented on the east side in 2017 (eBird 2020). This is not unlikely, even if Goering was reputably well acquainted with birds; he was a professional collector for European museums and menageries, a taxidermist and world-famous natural history illustrator. His narrative is illustrated with a lithograph clearly representing a Harpy Eagle based on his own painting (Goering 1893: 25; Fig. 2).

A report by the late E. Mondolfi (pers. comm. to E. Álvarez in 1982) of a fledgling shot in 1959 near Santa Bárbara del Zulia in the southern Lake Maracaibo basin is supported by a photograph (Fig. 3; see also Álvarez-Cordero 1996).

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Figure 2. Lithograph of a Harpy Eagle *Harpia harpyja* from the lowland forest of the southern Lake Maracaibo basin, based on a painting by Anton Goering (Goering 1893).

Further documentary research has also yielded an impressive photograph of a group of Yukpa natives from the middle río Atapsi on the east slopes of the Sierra de Perijá (*c*.800–1,300 m, at the western border of the Lake Maracaibo basin) holding a dead Harpy Eagle (Fig. 4). It was taken by H. Ginés during an expedition of the Sociedad de Ciencias Naturales La Salle to these remote mountains, sometime during 1947–51 (Hoyos 1988). It is somewhat puzzling, however, that as Ginés was an ornithologist he did not mention the species in his comprehensive, annotated list of birds of the Perijá Mountains (Ginés *et al*. 1953).

More than 50 years later, on 18 July 2004, D. Ascanio photographed two Harpy Eagles at 1,100 m in the Lajas River basin, *c*.50 km north-northeast of the río Atapsi (Ascanio & León 2004). This record permitted López-O. *et al*. (2014) and Ascanio *et al*. (2017) to include the Venezuelan side of the Perijá Mountains within the species' known distribution.

On 27 October 2006, while conducting field work in the southern Perijá Mountains, one of us (PAB), found an abandoned nest of Harpy Eagle nearly 30 m above ground on the main branch of a *Ceiba* tree in premontane forest, near one of the northern tributaries of the río del Norte (09°23'1.18"N, 73°01'33.25"W; 210 m). It was identified by its dimensions (diameter 305 cm, depth 95 cm) and situation, in a main fork, and being constructed of thick branches mean 8.6 cm in diameter. Such a nest is clearly bigger than, and different from,

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Figure 3. Photograph taken by an officer of the Venezuelan Ministerio de Agricultura y Cría in the airport of Santa Bárbara del Zulia (1959). Local people holding a recently shot grown juvenile Harpy Eagle *Harpia harpyja* (with permission of E. Mondolfi† to PAB)

that of Crested Eagle (e.g., diameter 220 cm, depth 42 cm, branch thickness 3.5 cm, usually sited in secondary forks; PAB unpubl.). Associated with this nest were bones of several mammal species: White-fronted Capuchin *Cebus albifrons* (one skull), Venezuelan Red Howler *Alouatta seniculus* (one skull each of a juvenile and an adult), Northern Tamandua *Tamandua mexicana* (one skull), Hoffmann's Two-toed Sloth *Choloepus hoffmanni* (two skulls, three humeri, two femurs); and the pelvic girdle of a large bird, possibly a Yellow-knobbed Curassow *Crax daubentoni*.

In this region, the Barí, another indigenous people in the Sierra de Perijá, have reported killing several Harpy Eagles in the last 38 years. Anthropologists visiting their territory since the early 1960s learnt of the presence of this species not only via cultural reference but also occasional observations of the bird itself. An individual was seen by one of us (ML) and his father, R. Lizarralde, in July 1974 atop the Serranía de Abusanqui, north of the Aricuaisá River, on the trail from 'Hacienda el Rodeo' to the village of Saimadoyi. In interviews with the Barí of Saimadoyi in April 1990, ML questioned them about the names of different birds using the illustrations in Meyer de Schauensee & Phelps (1978) as reference. They recognised the Harpy Eagle and named it 'bakóoba' or 'banko-banko'.

In addition to these anecdotal reports, ML was able to collect empirical evidence in their support. Firstly, in the late 1980s a Barí man (names of informants are not revealed for their protection) possessed a 7–8 cm-talon of a Harpy Eagle he had hunted in *c.*1983 in the community of Aruutatakae (at the south-west corner of Ciénagas del Catatumbo National Park and 20 km north of the río Catatumbo from the village of Campo Rosario). The difference in talon size between Harpy and Crested Eagles is significant: that of a Harpy can be twice or three times the size of a Crested Eagle's, based on measurements

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Figure 4. Photograph taken by Hermano Ginés during an expedition of the Sociedad de Ciencias Naturales La Salle to the Sierra de Perijá (at the western border of the Lake Maracaibo basin, *c.*1947–51), showing a group of natives (Yukpa) from the Atapsi River valley holding a recently shot adult Harpy Eagle *Harpia harpyja* (from Hoyos 1988, with permission)

taken of live birds by PAB, who has measured 47 Harpy (mean 8.6 cm for n = 20 males; 12.3 cm for n = 27 females) and 12 Crested Eagles (mean 3.5 cm for n = 5 males; mean 4.8 cm for n = 7 females).

The Barí informant explained that in his culture, this talon is a talisman that helps improve their aim while hunting, invoked by cupping their hands around the talon while closing their eyes and chanting their 'secrets'. These specialised chants are known only by a few elders. 'Secrets' are similar to Buddhist mantras that are whispered and repeated many times. This Barí stated that the Harpy Eagle's vision is very powerful and the one holding its talon acquires exceptional vision with the help of the 'secrets' (R. Lizarralde pers. comm. 2004).

Also, twice ML witnessed a feather-fan being used to blow air on kitchen fires. The first was in the home of a Barí at Saimadoyi (at the confluence of the Baksarani and Bachichida Rivers) in January 1995. This fan comprised the tail and primary feathers of two Harpy Eagles, one adult and one juvenile, identified by P. W. Trail (see Fig. 5). The feathers of the adult were harvested in August 1994, 15 km south of Saimadoyi in the headwaters of the río del Norte (at the foot of the Sierra de Perijá). According to this Barí, while carefully aiming his shotgun at a curassow high in the forest canopy, a Harpy Eagle struck the target with its talon. The shotgun blast hit both birds, killing the Harpy Eagle too. This hunter kept one of the eagle's talons as a talisman. The second occasion was in June 2002, in the northern headwaters of the río Lora, when ML saw a different feather-fan in a kitchen owned by another Barí. This fan was made of 15 or 18 tail and wing feathers of another Harpy. When asked about these feathers, he claimed they were from an eagle he had hunted in the upper

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Figure 5. Top to bottom: two fresh rectrices of Harpy Eagle *Harpia harpyja*, a smaller worn tail feather or secondary of a Harpy or Crested Eagle *Morphnus guianensis*, and a Harpy Eagle primary (P. W. Trail *in litt*. to CJS, September 2016). These are from at least one or more large eagles taken by Barí people in the headwaters of the río del Norte, south of the village of Saimadoyi, in the Sierra de Perijá, Venezuela, August 1994.

Serranía de Abusanqui, a few km west of his house. Identification in this case was based on standard ethnozoological methods, in which the witness determined the species concerned using an illustrated field guide.

The locations of the sightings described are similar, with little human presence and abundant fauna, especially spider (*Ateles*), howler (*Alouatta*) and capuchin (*Cebus*) monkeys, and several species of cracids (Lizarralde 2002, 2019, 2020). Therefore, Ciénagas del Catatumbo National Park, the southern Serranía de Abusanqui, and the upper Barí part of the Sierra de Perijá possess abundant food for Harpy Eagles (Beckerman & Lizarralde 2013, Lizarralde 2019, 2020).

Conclusions

The historical and recent data presented here (Fig. 6) reveal that the occurrence of Harpy Eagle in the Lake Maracaibo basin was overlooked by ornithologists during the 20th century, particularly in the Perijá Mountains and the Catatumbo lowlands despite the production of several avifaunal monographs during that period (Phelps 1943, Ginés *et al*. 1953, Seijas 1984, Viloria & Calchi 1993).

The lack of awareness of such a large bird of prey is unsurprising, as several other large and conspicuous vertebrates frequent in those regions remained either unknown or unconfirmed until recently. Notable are other raptors such as Andean Condor (Calchi & Viloria 1991) and Solitary Eagle *Buteogallus solitarius* (CJS unpubl.), as well as Spectacled Bear *Tremarctos ornatus* (Viloria *et al*. 1997), the endemic Zulia Toad-headed Sideneck *Mesoclemmys zuliae* (Pritchard & Trebbau 1984, Trebbau & Pritchard 2016), and the fish Dorada *Brycon polylepis* (Moscó-Morales 1988).

Harpy Eagle is rare and declining throughout the Neotropics (Vargas *et al*. 2006, Bierregaard *et al*. 2015, BirdLife International 2017). It generally requires large, uninterrupted expanses of rainforest to survive, although it will nest in areas disturbed by logging, intermixed with patches of pristine vegetation (Blanco 2007). Its range has been contracting (and population probably decreasing) over the last few decades, and in addition to having been extirpated locally, it is now very scarce over most of Middle America and at the southern

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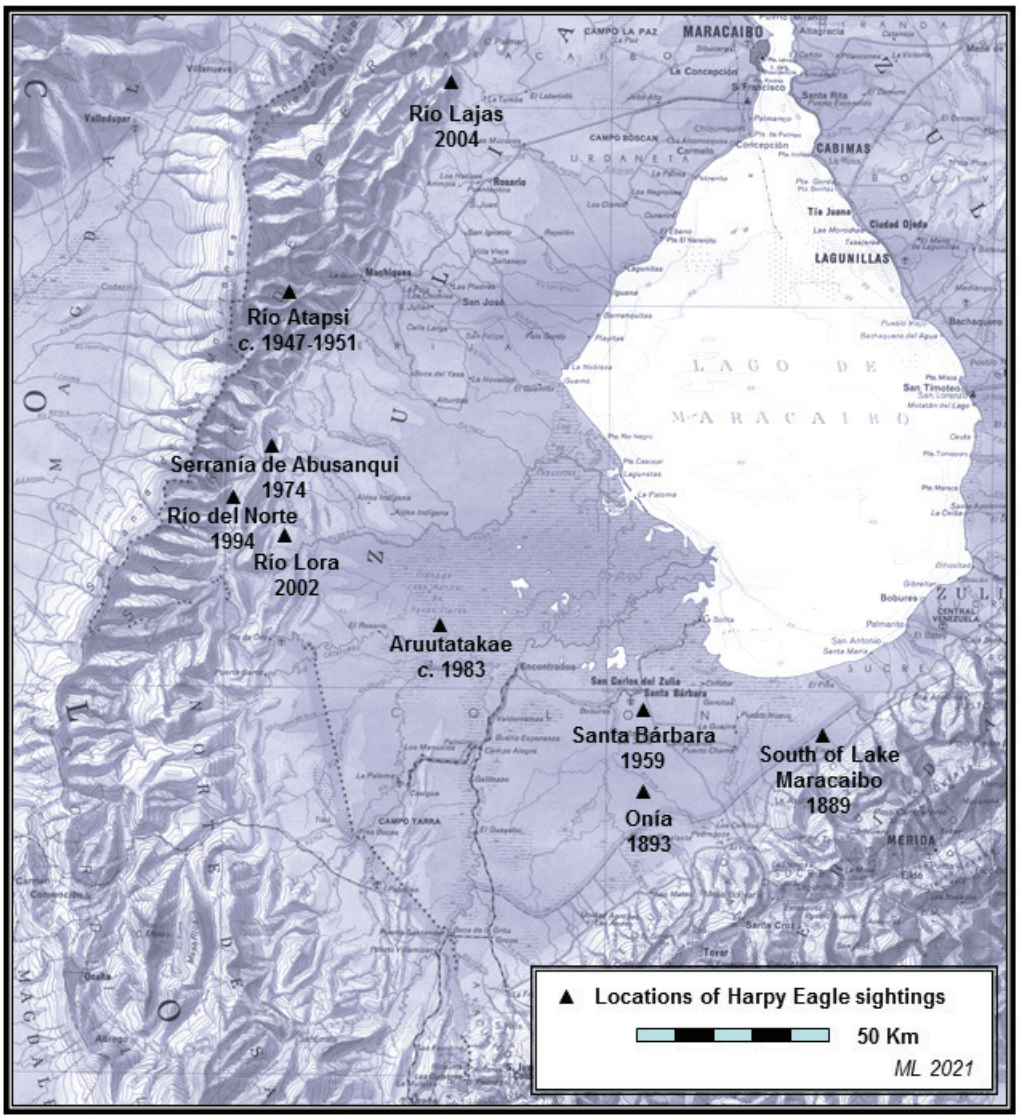


Figure 6. Map of the western and southern Lake Maracaibo basin in northern South America (Venezuela and Colombia) showing the location of Harpy Eagle *Harpia harpyja* records mentioned in the text.

edge of its range in north-east Argentina and Paraguay. The main threats are a combination of reduction of habitat and direct hunting (Álvarez & Ellis 1994, Álvarez-Cordero 1996, Stattersfield & Capper 2000, Blanco 2007, 2009, Trinca *et al*. 2008, Blanco & Álvarez 2009, Bierregaard *et al*. 2015, BirdLife International 2017, Schulenberg 2020). As a result, the species is considered globally Near Threatened, nearly meeting criteria A2cd+3cd+4cd (a reduction in range and/or habitat quality plus elevated levels of exploitation; IUCN 2001, BirdLife International 2017).

In Venezuela, Harpy Eagle is considered Vulnerable at the national level (Sharpe 2008, Sharpe *et al*. 2015), a status enshrined in national legislation (Venezuela 1996a,b). The records presented here and predictions based on Species Distribution Modelling (SDM) analysis (Miranda *et al*. 2019) suggest that the species might still be frequent in the

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southern and western Lake Maracaibo basin, where considerable areas of tropical forest are conserved within four strict protected areas and an indigenous reserve: Catatumbo-Barí Natural National Park (IUCN Cat. II; 1,581 km^2) in Colombia; Sierra de Perijá (IUCN Cat. II; 2,953 km^2) and Ciénagas del Catatumbo (IUCN Cat. II; 2,694 km^2) National Parks, Ciénagas de Juan Manuel Wildlife Reserve (IUCN Cat. IV; 715 km^2) and the Barí Indigenous Reserve (2,320 km^2; Lizarralde & Lizarralde 2002, Lizarralde & Lizarralde 2015, expanding Barí territory from 2,000 km^2 first decreed by the government [Venezuela 1961]) in Venezuela. We recommend that local ornithologists urgently instigate a population assessment plan in western Venezuela and search for the species in neighbouring Colombia.

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References:

Álvarez, E. & Ellis, D. H. 1994. Harpy Eagle (*Harpia harpyja*) nesting in manipulated forests. *J. Raptor Res*. 28: 51.

Álvarez-Cordero, E. 1996. Biology and conservation of the Harpy Eagle in Venezuela and Panama. Ph.D. thesis. Univ. of Florida, Gainesville.

Álvarez-Cordero, E., Ellis, D. H. & King, P. E. 1996. Long term satellite tracking of Harpy Eagles in Venezuela and Panama. *Abstracts Ann Amer. Orn. Union Meeting*, Boise State Univ., August 1996.

Appun, K. F. 1871. *Unter den Tropen. Wanderungen durch Venezuela, am Orinoco, durch Britisch Guyana und am Amazonenstrome, in den Jahren 1849–1868*, vol. 1. Hermann Costenoble, Jena.

Ascanio, D. & León, J. G. 2004. Rapid assessment of the birds of the Perijá Mountains. http://www.abtbirds.com/admin/images/reports/perija2004-07.pdf (accessed 15 February 2016).

Ascanio, D., Rodríguez, G. & Restall, R. 2017. *Birds of Venezuela*. Christopher Helm, London.

Beckerman, S. & Lizarralde, R. 2013. *The ecology of the Barí, rainforest horticulturalists of South America*. Univ. of Texas Press, Austin.

Bierregaard, R. O., Kirwan, G. M. & Sharpe, C. J. 2015. Harpy Eagle (*Harpia harpyja*). *In* del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world alive*. Lynx Edicions, Barcelona (retrieved from http://www.hbw.com/node/53150 on 7 October 2015).

BirdLife International. 2017. *Harpia harpyja*. The IUCN Red List of threatened species. https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22695998A117357127.en (accessed 10 June 2020).

Blanco, P. A. 2007. Harpy Eagle as detective of the landscape in the Forest Reserve of Imataca. *II Ann. Meeting Eagle Conserv. Alliance*. Puebla.

Blanco, P. A. 2009. Vulnerable eagle species and conservation action in Venezuela. *III Ann. Conf. Eagle Conserv. Alliance*. Ainsa, Aragon.

Blanco, P. A. & Álvarez, E. 2009. Estudio y conservación del águila harpía en Venezuela. *I Congr. Venez. Orn. & IV Jorn. Orn. Conserv. Aves Venezuela*. Barquisimeto.

Calchi, R. & Viloria, Á. L. 1991. Occurrence of the Andean Condor (*Vultur gryphus*) in the Perijá Mountains of Venezuela. *Wilson Bull*. 103: 720–722.

Dove, C. J., Milensky, C. M., Llactahuaman, S. & Thrasher, B. H. 2018. Two Harpy Eagles *Harpia harpyja* at high elevation in Peru. *Cotinga* 40: 98–100.

eBird. 2020. eBird: an online database of bird distribution and abundance. Cornell Lab of Ornithology, Ithaca, NY. https://ebird.org/ (accessed 10 June 2020).

Ginés, H., Aveledo H., R., Pons, A. R., Yépez Tamayo, G. & Muñoz Tebar, R. 1953. Lista y comentario de las aves colectadas en la región [de Perijá]. *Mem. Soc. Cienc. Nat. La Salle* 13(35): 145–202.

Goering, A. 1889. El mundo animal en la cuenca del río Escalante. *El Zulia Ilustrado* (Maracaibo) 1(5): 42–43.

Goering, A. 1893. *Vom tropischen Tieflande zum ewigen Schnee. Eine malerische Schilderung des schönsten tropenlandes Venezuela*. Adalbert Fischer's Verlag, Leipzig.

Goering, A. 1962. *Venezuela, el más bello país tropical*. Univ. de Los Andes, Mérida.

Gómez Carredano, J. L. 1994. *Las aves de presa de los llanos venezolanos*. Lagoven, S. A., Caracas.

Fjeldså, J. & Krabbe, N. 1990. *Birds of the high Andes*. Zool. Mus., Univ. of Copenhagen & Apollo Books, Svendborg.

Hilty, S. L. 2003. *Birds of Venezuela*. Princeton Univ. Press.

Hilty, S. L. & Brown, W. L. 1986. *A guide to the birds of Colombia*. Princeton Univ. Press.

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Hilty, S. L. & Brown, W. L. 2000. *Guía de las aves de Colombia*. American Bird Conservancy / Univ. del Valle / Sociedad Antioqueña de Ornitología, Bogotá.
Hoyos, J. 1988. *Imagen y huella de Hermano Ginés*. Imagen y Huella 5. Publ. Intevep, S.A., Caracas.
IUCN. 2001. *IUCN Red List categories and criteria: version 3.1*. *IUCN*, *Gland* & Cambridge, UK.
Lentino, M. & Colvée, J. 1998. *Lista de las aves del estado Delta Amacuro*. Soc. Conserv. Audubon de Venezuela, Caracas.
Linnaeus, C. 1758. *Systema naturae per regna tria naturae*, pt. 1(1). Tenth edn. Laurentius Salvius, Holmiae.
Lizarralde, M. 2002. Ethnoecology of monkeys among the Barí of Venezuela: perception, use and conservation. Pp. 85–100 *in* Fuentes, A. & Wolfe, L. (eds.) *Primates face to face: the conservation implications of human and nonhuman primate interactions*. Cambridge Univ. Press, Cambridge, UK.
Lizarralde, M. 2019. Etnoprimatología Barí en la Sierra de Perijá del estado Zulia. Pp. 391–415 *in* Urbani, B. & Ceballos-Mago, N. (eds.) *La primatología en Venezuela*, vol. 1. Colección Conjunta Academia Nacional de Ciencias Físicas, Matemáticas y Naturales / Univ. Simón Bolívar / Ed. Equinoccio, Caracas.
Lizarralde, M. 2020. Frugivorous monkeys feeding in a tropical rainforest: Barí ethnobotanical ethnoprimatology in Venezuela. Pp. 109–138 *in* Urbani, B. & Lizarralde, M. (eds.) *Neotropical ethnoprimatology. Indigenous people's perceptions of and interactions with nonhuman primates*. Springer Nature, Cham.
Lizarralde, M. & Lizarralde, R. 2015. Los Barí. Pp. 725–886 *in* Pereira, M. A. & Rivas, P. (eds.) *Los aborígenes de Venezuela*, vol. 5. Fundación La Salle de Ciencias Naturales & Instituto Venezolano de Investigaciones Científicas (IVIC), Caracas
Lizarralde, R. & Lizarralde, M. 2002. *Demarcación de la zona de reserva para el grupo étnico Barí de la Sierra de Perijá, estado Zulia.* Instituto Geográfico de Venezuela 'Simón Bolívar', Caracas.
López-O., J. P., Avendaño, J. E., Gutiérrez-Pinto, N. & Cuervo, A. M. 2014. The birds of the Serranía de Perijá: the northernmost avifauna of the Andes. *Orn. Colombiana* 14: 62–93.
[López-Rivas, E.] 1889. La arpía feroz. *El Zulia Ilustrado* (Maracaibo) 1(13): 108.
Meyer de Schauensee, R. & Phelps, W. H. 1978. *A guide to the birds of Venezuela*. Princeton Univ. Press.
Miranda, E. B. P., Menezes, J. F. S., Farias, C. C. L., Munn, C. & Peres, C. A. 2019. Species distribution modeling reveals strongholds and potential reintroduction areas for the world's largest eagle. *PLoS ONE* 14(5): e0216323.
Moscó-Morales, J. 1988. Dos nuevas especies de *Brycon* (Pisces: Characidae) de la cuenca del Lago de Maracaibo, Venezuela. *Anartia, Publ. Ocas. Mus. Biol. Univ. Zulia* (Maracaibo) 1: 1–23.
Phelps, W. H. 1943. Las aves de Perijá. *Bol. Soc. Venez. Cienc. Nat.* 8: 265–338.
Phelps, W. H. & Phelps, W. H., Jr. 1958. Lista de las aves de Venezuela con su distribución, tomo II, parte 1. No Passeriformes. *Bol. Soc. Venez. Cienc. Nat*. 19: 1–317.
Phelps, W. H., Jr. & Meyer de Schauensee, R. 1979. *Una guía de las aves de Venezuela*. Gráficas Armitano, C.A., Caracas.
Pritchard, P. C. H. & Trebbau, P. 1984. *The turtles of Venezuela*. Contributions to Herpetology No. 2. Society for the Study of Amphibians and Reptiles, USA.
Redman, N. 2008. Harpy Eagle *Harpia harpyja*: a new record for Monagas state, Venezuela. *Cotinga* 29: 169.
Rettig, N. L. 1977. In quest of the snatcher. *Audubon Mag*. 79: 26–49.
Rettig, N. L. 1978. Breeding behavior of the Harpy Eagle (*Harpia harpyja*). *Auk* 95: 629–643.
Röhl, E. 1948. *Exploradores famosos de la naturaleza venezolana*. Tipografía "El Compás", Caracas.
Röhl, E. 1956. *Fauna descriptiva de Venezuela (vertebrados)*. Third edn. Nuevas Gráficas, S.A., Madrid.
Schomburgk, R. H. 1840. Journey from Fort San Joaquim, on the Rio Branco, to Roraima, and thence by the rivers Parima and Merewari to Esmeralda, on the Orinoco, in 1838–9. *J. Royal Geogr. Soc. Lond*. 10: 191–267.
Schulenberg, T. S. 2020. Harpy Eagle (*Harpia harpyja*), version 1.0. *In* Schulenberg, T. S. (ed.) *Birds of the world*. Cornell Lab of Ornithology, Ithaca, NY. https://doi.org/10.2173/bow.hareag1.01 (accessed 10 June 2020).
Seijas, A. E. 1984. *Estudio faunístico preliminar de la reserva de Fauna Silvestre de las Ciénagas de Juan Manuel Aguas Blancas y Aguas Negras, Estado Zulia*. Serie Informes Técnicos DGSIIA/IT/147. Ministerio del Ambiente y de los Recursos Naturales Renovables, Caracas.
Sharpe, C. J. 2008. Aves. Pp. 122–157 *in* Rodríguez, J. P. & Rojas-Suárez, F. (eds.) *Libro Rojo de la fauna venezolana*. Third edn. Provita & Shell Venezuela, Caracas.
Sharpe, C. J., Ascanio, D. & Rojas-Suárez, F. 2015. Águila arpía, *Harpia harpyja*. *In* Rodríguez, J. P., García-Rawlins, A. & Rojas-Suárez, F. (eds.) *Libro Rojo de la fauna venezolana*. Fourth edn. Provita & Fundación Empresas Polar, Caracas. http://animalesamenazados.provita.org.ve/content/aguila-arpia (accessed 17 April 2016).
Sick, H. 1988. *Ornitología brasileira, uma introdução*. Third edn. Ed. Univ. de Brasília.
Stattersfield, A. J. & Capper, D. R. 2000. *Threatened birds of the world*. Lynx Edicions, Barcelona & BirdLife International, Cambridge, UK.
Trebbau, P. & Pritchard, P. C. H. 2016. *Venezuela y sus tortugas*. Ed. O. Todtmann, Caracas.
Trinca, C. T., Ferrari, S. F. & Lees, A. C. 2008. Curiosity killed the bird: arbitrary hunting of Harpy Eagles *Harpia harpyja* on an agricultural frontier in southern Brazilian Amazonia. *Cotinga* 30: 12–15.

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Urbani, B., Kvarnbäck, J. & González-Alentorn, M. R. 2012. Harpy Eagle *Harpia harpyja* preying on an Ursine Howler Monkey *Alouatta arctoidea* in northeastern Venezuela. *Rev. Catalana Orn.* 28: 40–44.

Vargas, J. J., Whitacre, D., Mosquera, R., Albuquerque J., Piana, R., Thiollay, J.-M., Márquez, C., Sánchez, J. E., Lezama-López, M., Midence, S., Matola, S., Aguilar, S., Rettig, N. & Sanaiotti, T. 2006. Estado y distribución actual del águila arpía (*Harpia harpyja*) en Centro y Sur América. *Orn. Neotrop*. 17: 39–55.

Vargas Machuca, B. 1599. *Milicia y descripción de las Indias, por el Capitán don Bernardo de Vargas Machuca, Cauallero Castellano, natural de la villa de Simancas. Dirigido al Licenciado Pavlo de Laguna Presidente del Consejo Real de Indias*. Pedro Madrigal, Madrid.

Venezuela. 1961. Zona ocupada por indígenas: resolución de los Ministerios de Agricultura y Cría y de Justicia. *Gaceta Oficial de la República de Venezuela* No. 26.520. Government of Venezuela, Caracas.

Venezuela. 1996a. Decreto 1485: animales vedados para la caza. *Gaceta Oficial de la República de Venezuela* No. 36.059 – 7 de octubre de 1996. Government of Venezuela, Caracas.

Venezuela. 1996b. Decreto 1486: especies en Peligro de Extinción. *Gaceta Oficial de la República de Venezuela* No. 36.062 – 10 de octubre de 1996. Government of Venezuela, Caracas.

Viloria, Á. L. & Calchi, R. 1993. Una lista de los vertebrados vivientes de la Sierra de Perijá, Colombia y Venezuela. *BioLlania* (Guanare) 9: 37–69.

Viloria, Á. L., Mondolfi, E., Yerena, E. & Herrera, F. 1997. Nuevos registros del oso de anteojos o frontino (*Tremarctos ornatus* F. Cuvier) en la Sierra de Perijá, Venezuela. *Mem. Soc. Cienc. Nat. La Salle* 55(143): 3–13.

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