

SPIZAETUS

NEOTROPICAL RAPTOR NETWORK NEWSLETTER

ISSUE 37

JUNE 2024

FALCO DEIROLEUCUS IN ECUADOR

IBYCTER AMERICANUS IN NICARAGUA

DIURNAL RAPTORS IN BRASIL

FALCO RUFIGULARIS IN MEXICO

IV NEOTROPICAL RAPTOR CONFERENCE



SPIZAETUS

NEOTROPICAL RAPTOR NETWORK NEWSLETTER

Issue 37 © June 2024
English Edition, ISSN 2157-8958

Cover Photo

Falco deiroleucus photographed in Belize
© Angel Muela, Whitehawk Birding

Editors/Translators

Marta Curti, Enzo Basso Quinche, and Tate Mason

Graphic Design

Marta Curti

Spizaetus: Neotropical Raptor Network Newsletter © June 2024

www.neotropicalraptors.org

This newsletter may be reproduced, downloaded, and distributed for non-profit, non-commercial purposes. To republish any articles contained herein, please contact the corresponding authors directly



 @neotropicalraptors.org

 neotropicalraptor



CONTENIDO

CONFIRMING THE PRESENCE OF ORANGE-BREASTED FALCON (<i>FALCO DEIROLEUCUS</i>) IN SOUTHERN ECUADOR <i>Fernando Andrade & Paul A. Molina</i>	4
STATUS, RECORDS, AND NESTING SITES OF THE RED-THROATED CARACARA (<i>IBYCTER AMERICANUS</i>) IN NICARAGUA <i>Heydi M. Herrera-Rosales, José Luis Rojas, Fabricio José Díaz-Santos, Andrew Rothman, John Hannan, Francisco Muñoz, Danilo Moreno & Biancy Maciel Cantarero</i>	8
MONITORING OF DIURNAL RAPTORS IN THE GUARTELÁ STATE PARK REGION, TIBAGI, PARANÁ, BRAZIL <i>Pedro Scherer Neto, Adriano Travassos, Antenor Silva Júnior, Romulo Cicero Silva, Tony A. Bichinsky Teixeira, Luiz Fernando F. de Macedo, Valdi Paula Gonçalves, Bruno Henrique C. Grolli, Leonel Andermann, Louri Klemann Júnior, Alberto Urban Filho, André Pelanda, & Alessandro R. Carneiro</i>	18
EXPANSION OF THE AREA OF DISTRIBUTION AND ALTITUDINAL RANGE OF THE BAT FALCON (<i>FALCO RUFIGULARIS</i>) IN MEXICO <i>JESÚS FAVELA-MESTA</i>	31
VI NEOTROPICAL RAPTOR CONFERENCE <i>Marta Curti</i>	42
OF INTEREST	45

The NRN is a membership-based organization. Its goal is to aid the research and conservation of Neotropical raptors by promoting communication and collaboration among biologists, raptor enthusiasts, and other conservationists working in the Neotropics. To join please e-mail the NRN coordinator, Marta Curti, at mcurti@peregrinefund.org, stating your interest in Neotropical raptor research and conservation.

CONFIRMING THE PRESENCE OF ORANGE-BREASTED FALCON (*FALCO DEIROLEUCUS*) IN SOUTHERN ECUADOR

By **Fernando Andrade** and **Paul A. Molina**
email: falco2018ec@gmail.com



Figure 1. Female *Falco deiroleucus* feeding on a Rock Dove (*Columba livia*), 20 July 2023, Gualaquiza. Photo © Wilson Cabrera.

The Orange-breasted Falcon (*Falco deiroleucus*) is distributed from southern Mexico to northern Argentina (Berry et al. 2020). In Ecuador, it has been recorded mainly in the north (Carrión and Vargas 2008; Freile y Restall 2018)), with a record in the southern inter-Andean zone of the country (Molina 2022). Currently, the species is under the category of “Near Threatened” globally (BirdLife International 2022) and “Endangered” on Ecuador's red list (Freile et al. 2019).

In this note we present evidence of the presence of the Orange-breasted Falcon in southern Ecuador, with a new record in the inter-Andean zone and seven records in the Amazon. Additionally, we present evidence of it hunting a domestic pigeon (*Columba livia*). The first record corresponds to an adult Orange-breasted Falcon that was found in an urban area in Gualaceo, Azuay. The individual apparently had a wound in one of its wings. It died five days after it was discovered.

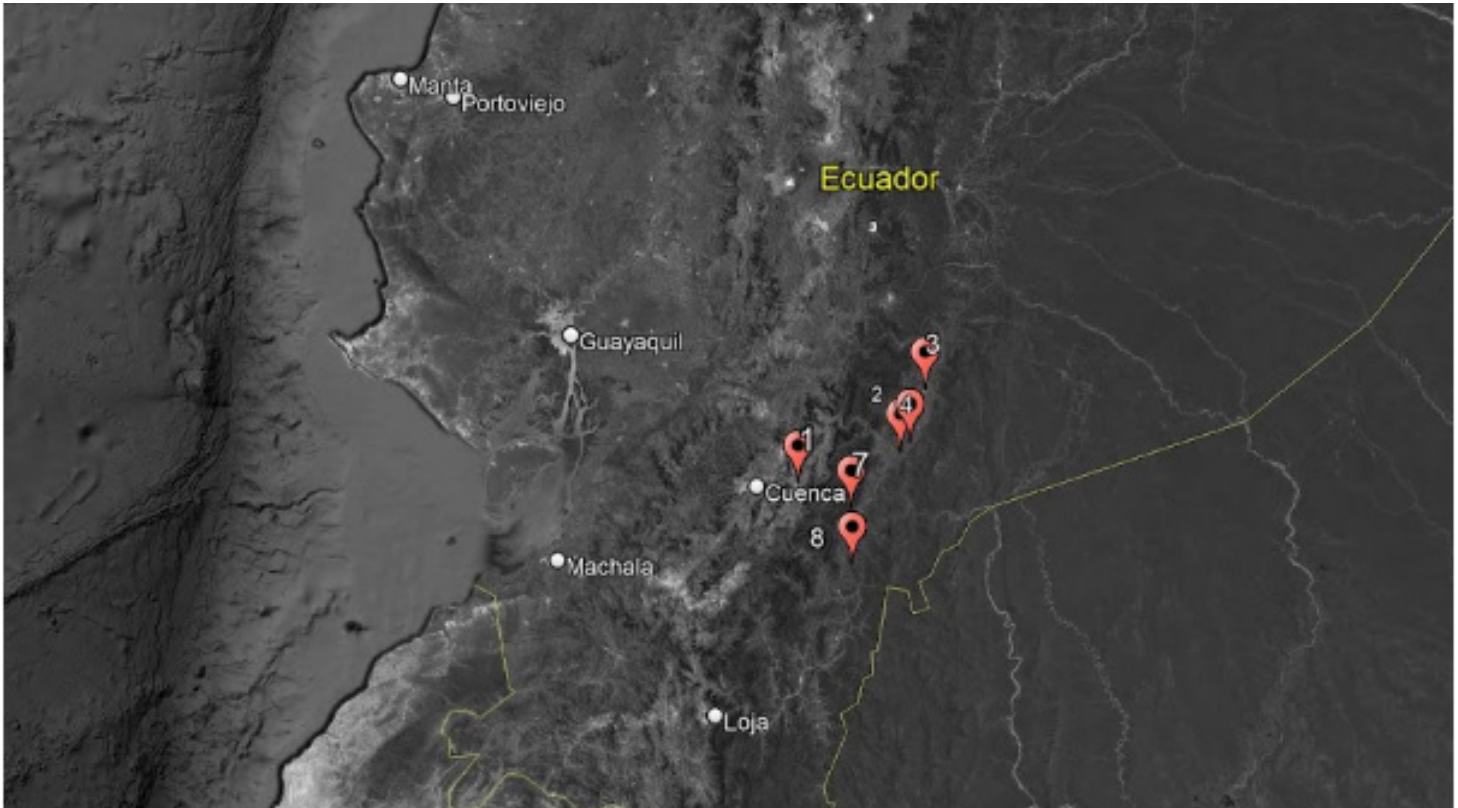


Figure 2. Map of locations of new records in southern Ecuador for *Falco deiroleucus*.

The subsequent records belong to the province of Morona Santiago, where on several occasions individuals were observed perching in large trees on the edge of the Sucúa Macas Highway. Record #8 belongs to a male that was chasing domestic pigeons on private land (Table 1).

The perimeter that includes the eight sighting points is equivalent to an approximate area of 236 km². The record in the southern inter-Andean zone is 31 km from the closest point in the Amazon belt. We did not include coordinates of the sites, since this is a sensitive species it is better not to give away the exact locations of these sightings.

Table 1. Records of *Falco deiroleucus* in southern Ecuador

#	Location	Date	Observation
1	Gualaceo, Azuay	17/12/2019	Handed over to police was injured and died
2	Tayuza, Morona Santiago	2/1/2020	Perched on old tree without leaves
3	Sucua, Morona Santiago	29/4/2020	Feeding on domestic pigeon (<i>Columba livia</i>)
4	Chiguinda, Morona Santiago	21/12/2020	Perched male
5	Chiguinda, Morona Santiago	19/1/2021	Perched male and female
6	Mendez, Morona Santiago	19/1/2021	Vocalizing male
7	Cerro Bosco, Morona Santiago	4/6/2021	Perched female
8	Gualaquiza, Morona Santiago	20/7/2023	Hunting in flight

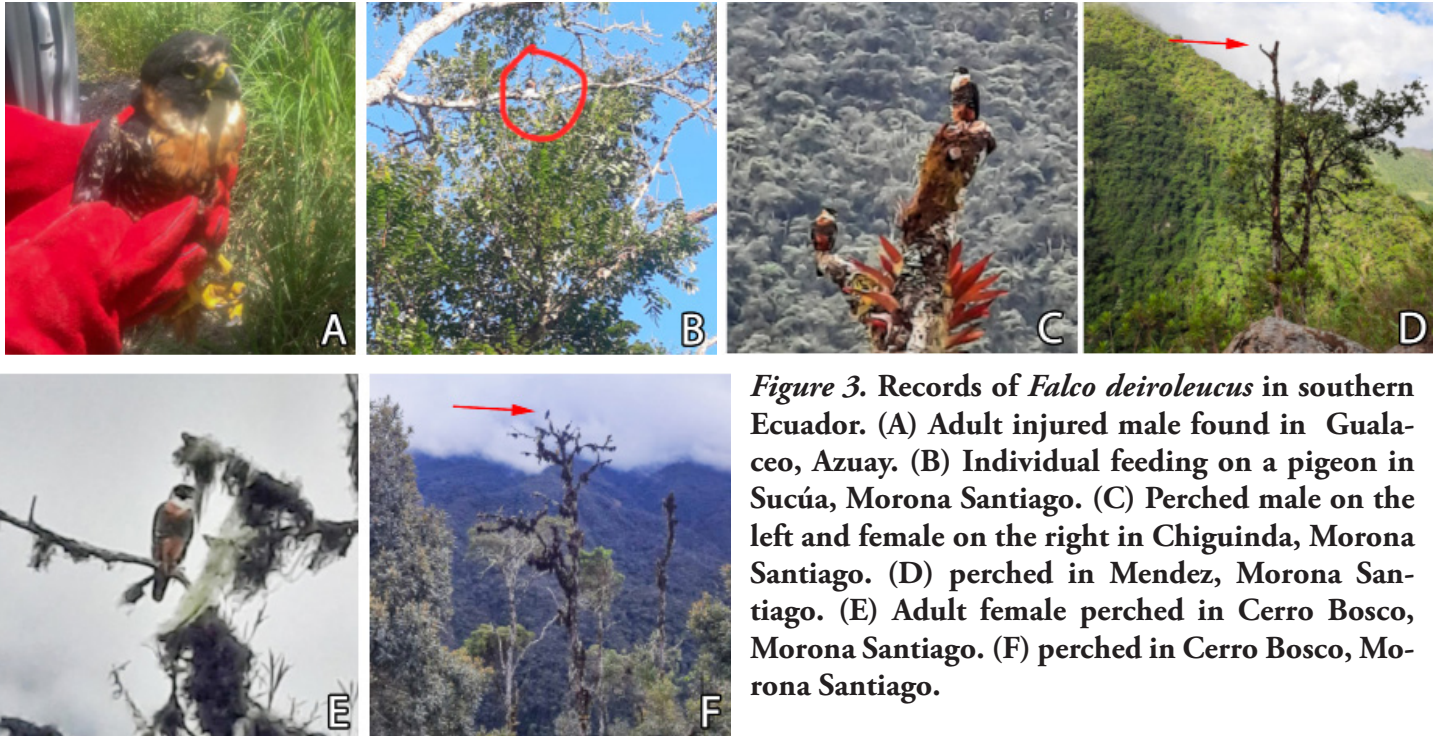


Figure 3. Records of *Falco deiroleucus* in southern Ecuador. (A) Adult injured male found in Guala-cco, Azuay. (B) Individual feeding on a pigeon in Sucúa, Morona Santiago. (C) Perched male on the left and female on the right in Chiguinda, Morona Santiago. (D) perched in Mendez, Morona Santiago. (E) Adult female perched in Cerro Bosco, Morona Santiago. (F) perched in Cerro Bosco, Morona Santiago.

Future research should include monitoring the area to confirm the establishment of a potential population in the exposed Amazon zone, since the availability of prey, potential nesting sites in the area, and new P. Molina records (unpublished

data) suggest that the individuals observed could be residents. It is important to investigate this further, as well as study other raptor species of which much of their natural history and local movements or migrations are unknown.

Figure 4. Perched female, 25 June 2021, Chiguinda. Photo © Fernando Andrade



References

- Berry, R., C. L. Wood., and B. L. Sullivan. 2020. Orange-breasted Falcon (*Falco deiroleucus*), version 1.0. In Birds of the World. Cornell Lab of Ornithology, Ithaca, NY, USA.
- BirdLife International. 2022. *Falco deiroleucus*. IUCN Red List of Threatened Species.
- Carrión J. M., F. H. Vargas. 2008. First record of the Orange-breasted Falcon (*Falco deiroleucus*) in Quito. Neotropical Raptor Network Newsletter 5: 2.
- Freile, J. F., and R. Restall. 2018. Birds of Ecuador. London (UK): Helm.
- Freile, J. F., T. G. Santander., L. Carrasco., D. F. Cisneros-Heredia., E. A. Guevara., M. Sánchez Nivicela., and B. A. Tinoco 2019. Lista roja de las aves del Ecuador continental. Ministerio del Ambiente, Aves y Conservación, Comité Ecuatoriano de Registros Ornitológicos, Universidad del Azuay, Red Aves Ecuador y Universidad San Francisco de Quito. Quito, Ecuador.
- Molina P. A. 2023. New records of Orange-breasted Falcon (*Falco deiroleucus*) for the inter-Andean region south of Ecuador. Neotropical Raptor Network Newsletter 35: 6.

* * *

STATUS, RECORDS, AND NESTING SITES OF THE RED-THROATED CARACARA (*IBYCTER AMERICANUS*) IN NICARAGUA

By Heydi M. Herrera-Rosales¹, José Luis Rojas², Fabricio José Díaz-Santos³, Andrew Rothman⁴, John Hannan⁵, Francisco Muñoz⁶, Danilo Moreno⁷, and Biancy Maciel Cantarero⁸

¹Bióloga, Conservación y Manejo de Vida Silvestre heydiherrera@yahoo.com, Nicaragua

²Ingeniero Agroforestal redjoseph55@gmail.com, Siuna – Nicaragua.

³Ecólogo, Manejo de Bosques Tropicales y Biodiversidad fjdisan@gmail.com, Nicaragua

⁴Biólogo andrewrothman@yahoo.com, Estados Unidos de Norteamérica

⁵Biólogo jhannan1@me.com, Estados Unidos de Norteamérica

⁶Conservacionista y observador de aves chicoamazilia@yahoo.com, Estelí - Nicaragua

⁷Conservacionista y observador de aves danilomoreno@msn.com, Estelí - Nicaragua

⁸Bióloga biancyc@gmail.com, Siuna – Nicaragua

The Red-throated Caracara (*Ibycter americanus*) is also known as “Katauh” in the Mayangna and Miskito languages. This species is known to be frugivorous-insectivorous, feeding on wasp larvae, myriapods and other invertebrates (McCann et al. 2014). It is distributed from the south-east of Mexico to Ecuador and central Brazil (Howell and Webb 1995), inhabiting open areas associated with tropical humid forest (Holdridge et al. 1971).

In Nicaragua, the Red-throated Caracara is listed as Endangered (EN) because its populations are restricted to some localities in the Caribbean (Red List 2018, eBird 2023). However, the IUCN (2020) and Birdlife international (2023) consider it to be of least concern. Like other Neotropical

raptors, this species has experienced a decline in its populations due to habitat loss (e.g., local extinctions have been reported in Mesoamerica), so its conservation status requires review. (Howell and Webb 1995, McCann et al., 2010 and Bennett et al. 2014, Gallardo 2014).

Casual sightings of Red-throated Caracara in Nicaragua

In the Nicaraguan Caribbean, the Bosawas Biosphere Reserve (RBB) is located in the north and the Río San Juan Biosphere Reserve (RBR SJ) is found in the south. Each reserve is made up of several protected areas with different management categories. These forested landscapes are of high value for the conservation of regional avifauna because they house a great diversity of forest

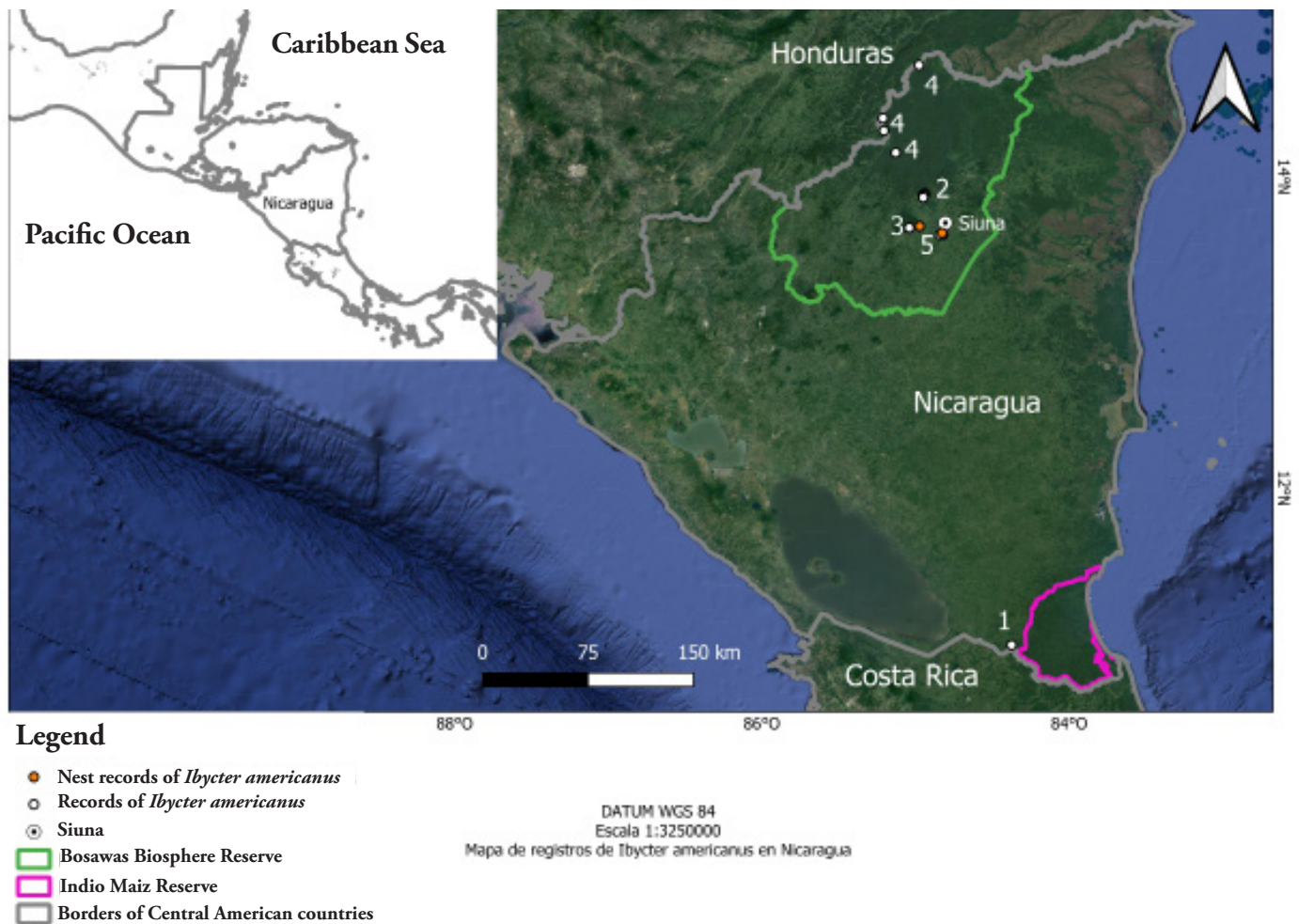


Figure 1. Sightings of Red-throated Caracara (*Ibycter americanus*): (1)El Castillo-Río San Juan (on the edge of the Indio Maíz Biological Reserve, 2000) in the Bosawás Biosphere Reserve, (2)Mayangna Sauni Bas Indigenous Territory (MSBas 2015), (3)Cerro Saslaya National Park (PNCS 2016), (4)Mayangna Sauni Bu Indigenous Territory (MSBu 2017), Miskito Indian Tasbaika Kum (MITK 2017, 2019) and Kipla Sait Tasbaika (KST 2019), (5)Communities of El Carao (nest in 2020), Fonseca (2021), Amparo (2022), and Las Brisas (nest in 2023). Prepared by: Fabricio J. Díaz-Santos, October 2023.

specialist birds that are key to the functioning of the ecosystem within the Mesoamerican region.

The first record of the Red-throated Caracara in Nicaragua was made in 2000 in an undisturbed forest within the El Castillo Community in the RBRJS, very close to the San Juan River and adjacent to the Indio Maíz Biological Reserve (Figure 1; Table 1). This species was little known in the Caribbean region of Nicaragua at that time, with four records of skins coming from

the Caribbean and the Center of the country (American Museum of Natural History: AMNH 1908 and AMNH 1909 and another collection by Tom Will in 1962). Due to the low number of records, this species was classified as rare (Martínez-Sánchez and Will 2010). Currently, there are few reports of the species and all are restricted to the Caribbean Zone of Nicaragua.

The Cerro Saslaya National Park (PNCS) is located in the northern region of Nicaragua. It is

Table 1. Sightings of Red-throated Caracara (*Ibycter americanus*) from 2000 to 2023 and reports of nesting in the Bosawás Biosphere Reserve, Nicaragua.

Territory / Protected Area/ Community	Community	Data	# Indiv	Coordinates		Notes	Observers
Rio San Juan	El Castillo	10/02/2000	6	N 11°00'45"	O 84°22'15"	Bosque del Señor Efraín Miranda	H2, FD, EM
MSBas	Sikilta	18/03/2015	1	N 13°54'29.5"	O 84°55'07.6"	Bird monitoring	FD
		21/03/2015		N 13°53'47.8"	O 84°55'26.6"		H2, BC, AB, CT
		21/03/2015		N 13°55'18.1"	O 84°54'48"		H2, BC, AB
		27/03/2015		N 13°54'30.4"	O 84°55'11.4"		
		28/03/2015		N 13°54'38.3"	O 84°55'11.9"		
		04/04/2015		N 13°54'38.3"	O 84°55'11.9"		
		12/04/2015		N 13°54'48.2"	O 84°55'25.1"		
		19/04/2015		N 13°53'47.8"	O 84°55'26.6"		H2, BC, AB, CT
		20/04/2015		N 13°54'29.5"	O 84°55'07.6"		H2, BC, AB
PNCS	Saslaya	16/03/2016	1	N 13°42'10.8"	O 85°01'03.0"	vocalization in forest during installation of camera traps	FD
MSBu	Puluwas	25/02/2017	3	N 14°11'10.2"	O 85°06'11.3"	search area, camera trap route	FD, CG
MITK	Inipuwas	08/02/2017	4	N 14°24'35.2"	O 85°11'05.3"	search area, camera trap route	CG
	San Andres	25/02/2019	8	N 14°19'41.9"	O 85°10'45.7"	open area, bird monitoring	H2, MH, MB
KSTK	Andris Tara	01/03/2019	10	N 14°44'55.2"	O 84°56'55.2"	open area, bird monitoring	
Hormiguero	El Carao	22/01/2020	2	N 14°44'55.2"	O 84°56'55.2"	Ceiba (2 adults)	JLR, JH, AR, FD
	El Carao	31/03/2020	3	N 13°42'43.3"	O 84°56'55.2"	Nesting: two adults and a fledgling between Guacimos and Guaba trees	JLR y LL
Fonseca	Fonseca	22/01/2021	2	N 13°39'21.4"	O 84°47'38.9"	incidental observation after the passage of hurricanes ETA/IOTA looking for shelter and food (two adults)	JLR
Amparo	Amparo	19/03/2022	2	N 13°39'58.85"	O 84°48'5.51"	2 adults	
Las Brisas	Las Brisas	26/02/2023	3	N 13°39'20.3"	O 84°49'04.2"	Nesting: in a tree in Guanacaste (two adults + 1 chick)	JLR, DM y FM

Territory / Protected Area / Community; (MSBas) Territorio Indígena Mayangna Sauni Bas; (PNCS) Parque Nacional Cerro Saslaya; (MSBu) Territorio Indígena Mayangna Sauni Bu; (MITK) Territorio Indígena Miskito Indian Tasbaika Kum y (KST) Territorio Indígena Kipla Sait Tasbaika (KST). **Observadores:** H2 (Heydi Herrera), FD (Fabricio Díaz), EM (Efraín Miranda), BC (Biancy Cantarero), AB (Atanacio Baldonado), CT (Celestino Taylor), CG (Carlos Gonzales), MH (Miguel Hernández), MB (Mario Bolaños), JLR (José Luis Rojas), JH (John Hannan), AR (Andrew Rothman), LL (Luis Largaespada), DM (Danilo Moreno) y FM (Francisco Muñoz).

part of the RBB covering the forested landscape of the indigenous territories of Río Coco and Bocay, among others. In this region, between 2015 and 2019, we obtained casual records of Red-throated Caracara in the indigenous communities of Sikilta, Puluwas, Inipuwas, San Andrés and Andris Tara (Figure 1, Table 1).

These territories contain ecosystems of high national and regional value, supporting the last healthy populations of numerous species of specialist birds from the forests of the Mesoamerican Caribbean - among them the Red-throated

Caracara - which are key to the conservation of regional biodiversity (Díaz Santos et al. 2015). Other birdwatchers have reported casual records of the species in the Caribbean region of Nicaragua (eBird 2023).

The viability of Red-throated Caracara populations in the RBB could be evidenced by more recent casual records close to the city of Siuna, in the Communities of El Carao (2020), Fonseca (2021), Amparo (2022) and Las Brisas (2023) (Figure 1, Table 1). Likewise, recently, active nesting sites have been found in anthropogenic areas:

Figure 2. First Nest of *Ibycter americanus* in the El Carao - Hormiguero Community. The platform was formed by dry branches of a Ceiba tree (*Ceiba pentandra*). March 2020. Photo © José Luis Rojas





Figure 3. *Ibycter americanus* fledgling in the El Carao - Hormiguero Community, moving among Guaba trees (*Inga* sp.). The adults were in the area. March 2020. Photo © José Luis Rojas

one in the community of El Carao recorded in March 2020 and another in Las Brisas in February 2023. These would be the first nesting records of this species in Nicaragua.

Other casual records by bird watchers (Kjeldsen 2005, eBird 2023), not included in this article, report this species along the Caribbean coastal plain of Nicaragua, where there are isolated patches of natural broadleaf forest associated with wetlands, plains, and pine forests of the Caribbean region of Mesoamerica.

Nesting Description

We first visited the farm where the nest tree is located on 22 January 2020. We observed two adult Red-throated Caracaras, but the nest was not detected, as the nest tree still had leaves (Table 1). That day we also observed King Vulture (*Sarcoramphus papa*), Keel-billed Toucan (*Ramphastos sulfuratus*), Yellow-throated Toucan (*Ramphastos ambiguus*), Brown Jay (*Psilorhinus morio*), and Montezuma Oropendola (*Psarocolius montezuma*) among other avifauna.

The nest itself was found by chance on 31 March, while we were evaluating a Cocoa (*Theobroma cacao*) plantation during the dry season of 2020. The nest was located in a Ceiba tree (*Ceiba pentandra*) approximately 60 m high (Figure 2), located near a permanent stream. The area surrounding the nest tree was open with scattered trees of different species, and was being used as a cattle pasture. Near the nest site there was an area of cocoa cultivation with timber-yielding trees.

The nest was made up of plant material and dry branches. One fledgling and its parents (Figures 3 and 4) was observed moving between branches of a Ceiba and neighboring Guaba (*Inga* sp.) and Guarumo (*Cecropia* sp.) trees. The landowners indicated that the Red-throated Caracaras remained in the area between December-April. Courtship and the establishment of the breeding pair probably took place in December, with

nesting and egg hatching occurring between January-March. The landowners also said that during that period they observed the birds feeding on cocoa and sapodilla fruits (*Pouteria* sp.).

The second nest was found by chance in February 2023 in the Las Brisas community (Table 1). The nest was located in a Guanacaste tree (*Enterolobium cyclocarpum*) approximately 20 m high. The nest was formed by a colony/bed of orchids (*Trigonidium egertonianum*, Figure 5). McCann et al. (2010) mentioned the use of natural nesting platforms as a characteristic of this species. The tree was located in an open area with other scattered trees and a remnant of secondary forest approximately 8 km away. We observed a pair of adults calling and flying over the nest area (Figure 6). We quickly retreated to avoid stressing the parents or the nestling.

Figura 4. Adult *Ibycter americanus* in El Carao - Hormiguero, January 2020. Photo © John Hannan.





Figure 5. Red-throated Caracara nest in the Las Brisas Community, with a natural orchid (*Trigonidium egertonianum*) platform in a Guanacaste tree (*Enterolobium cyclocarpum*), February 2023. Photo © José Luis Rojas.

Conclusion

These records of the Red-throated Caracara highlight the importance of natural forests in the RBB and the RBRSJ in maintaining viable populations of this species in Nicaragua. Here, we have documented the flexibility of this species to adapt to areas of human use, including during stages of breeding, nesting, and rearing of nestlings.

However, there are many questions that remain to be answered about what this species requires to maintain viable populations. Future monitoring of the nests at the sites identified in this article will help identify the elements that support the reproductive success and subsequent parental

care of the nestlings of this species (McCann et al. 2014). For example, the distance between the nest and the forest remnants, and the characteristics of the vegetation matrix surrounding the nest could be evaluated. Additionally, this work could serve as a reference to develop future research on the Red-throated Caracara throughout its distribution, and by continuing with the studies developed by Bennett et al. (2014), and the works carried out by Thiollay (1991) and McCann et al. (2010) in South America.

Other casual records of this species in Nicaragua (eBird 2023) are consistent with those of Bennett et al. (2014), reporting nesting sites in Caribbean

Pine. They show the importance and capacity of this tree species to maintain viable populations and support the conservation of the Red-throated Caracara in Mesoamerica (Bennett et al. 2014).

The next steps should be focused on the intensive search for nests and monitoring annual breeding events. In addition, some actions to restore the vegetation surrounding the nesting sites should be considered, while evaluating the availability

and use of resources needed for nesting, and how these resources impact behavioral patterns related to raising nestlings. Finally, we must evaluate how the processes of use and management of vegetation at the landscape scale influence their movements and the use of space (Bennett 2004, Vandermeer et al. 2007, McCann et al. 2010, 2014, Maeda et al. 2023).

Figure 6. Red-throated Caracara perched in a Guanacaste tree (*Enterolobium cyclocarpum*), in Las Brisas, February 2023. Photo © José Luis Rojas



Acknowledgments

To the project “Improving livestock management for economic and environmental stability in the Mesoamerican Moskitia”, of the Darwin Initiative and Wildlife Conservation Society (WCS), and to the project “Protecting habitat for Wood Thrush: Nicaragua and Honduras”, project #F17AP00674, funded by the Neotropical Migratory Bird Conservation Act of the Fish and Wildlife Service, implemented by the American Bird Conservancy (ABC) and WCS. Gratitude extended to the leaders of the Ríos Coco and Bocay territories and especially to the local residents for allowing our entry, particularly to the indigenous collaborators of WCS Carlos Gonzales Dixon, Miguel Hernández, Mario Bolaños. To the Rangers: Atanacio Baldonado from the Cerro Saslaya National Park and Celestino Taylor, from the community of Sikilta. We especially thank Cosme Palma from the El Carao community and Santos González from the Las Brisas community, owners of the farms where we recorded the aforementioned nests, and Luis Adán Largaespada for his support during the second visit to the El Carao community. Finally, we thank the editors of the *Spizaetus* Newsletter.

References

- Bennet, A. F. 2004. Enlazando el paisaje: El papel de los corredores y la conectividad en la conservación de la vida silvestre. UICN. Unión Mundial para la Naturaleza. San José, Costa Rica. 278pp.
- Bennett, R., I. Zúniga., M. Bonta., D.L. Anderson., S. McCann, and L. Herrera. 2014. First nest record of Red-throated Caracara (*Ibycter americanus*) for Middle America. Short communications. The Wilson Journal of Ornithology 126(2):389-392.
- BirdLife International. 2023. Species factsheet: *Ibycter americanus*. Downloaded from <http://datazone.birdlife.org/species/factsheet/red-throated-caracara-ibyceter-americanus> Accessed on 30 October 2023.
- Díaz Santos, F., H.M. Herrera-Rosales., J. Polisar. 2015. Mamíferos, aves y bosques naturales en Parque Nacional Cerro Saslaya y territorio indígena Mayangna Sauni Bas, implicaciones para la conservación – Reserva de Biosfera Bosawas, Nicaragua. Informe técnico Wildlife Conservation Society.
- eBird 2023. Red-throated Caracara (*Ibycter americanus*). (Accedido: 30 octubre 2023) <https://ebird.org/spain/map/retcar2?env.minX=-88.3718410127189&env.minY=-20.8226117438577&env.maxX=-45.2527073749819&env.maxY=15.9977167664452>
- Gallardo, R.J. 2014. Guide to the birds of Honduras. Second Printing. Ilus. J. Still, M. DiGiorgio y I. Griffiths. Published by Mountain Gem Tours. 555p.

- Holdridge, L. R., W. Grenke., W.H. Hatheway, T. Liang, and J.A. Tosi. 1971. Forest environments in tropical life zones: A pilot study. Pergamon Press, Oxford.
- Howell, S.N.G. and S. Webb. 1995. A guide to the birds of Mexico and northern Central America. Reprinted 1999. Published in the United States by Oxford Univ. Press, New York, Reprinted 2010, USA. 851p.
- Kjeldsen, J.P. 2005. Aves del municipio río Prinzapolka, un inventario de base. Wani, Revista del caribe nicaragüense. 41:31-64.
- Lista Roja. Agosto 2018. Especies vertebradas en riesgo de extinción de Nicaragua. 2da Edición. ISBN: 978-99964-872-1-7.
- Maeda E., L.E.O.C. Aragão., J.C.A. Baker., L.C. Baldino., Y. Moura., A.D. Nobre., M.H. Nunes., C.H.L. Silva-Junior and J.C. dos Reis. 2023. Land use still matters after deforestation. Communications Earth & Environment 4 (29). DOI: 10.1038/s43247-023-00692-x
- Martínez-Sánchez, J. C., and T. Will (eds). 2010. Thomas R Howell's check-list of the birds of Nicaragua as of 1993. Ornithological Monographs, No. 68.
- McCann S., O. Moeri., T. Jones., S. O'Donnell., and G. Gries. 2010. Nesting and nest-provisioning of the Red-throated Caracara (*Ibycter americanus*) in Central French Guiana. Journal of Raptor Research, 44(3):236-240. The Raptor Research Foundation DOI: <http://dx.doi.org/10.3356/JRR-09-75.1> URL: <http://www.bioone.org/doi/full/10.3356/JRR-09-75.1>
- McCann S., C. Scott., T. Jones., O. Moeri., S. O'Donnell and G. Gries. 2014. Red-throated Caracara, a falconid raptor, rivals predatory impact of army ants on social wasps. Insectes Sociaux 62:101-108. DOI 10.1007/s00040-014-0384-0
- The IUCN Red List of Threatened Species. 2020: e.T22696229A163572412. <https://www.iucnredlist.org/species/22696229/163572412> Accessed on 30 October 2023.
- Thiollay, J.-M. 1991. Foraging, home range use and social behavior of a group-living rainforest raptor, the Red-throated Caracara *Daptrius americanus*. Ibis 133: 382–393. (Resumen)
- Vandermeer J., I. Perfecto., S. Philpott, and M.J. Chappell. 2007. Capítulo 4. Reenfocando la conservación en el paisaje: la importancia de la matriz. En Evaluación y conservación de biodiversidad en paisajes fragmentados de Mesoamérica. C.A. Harvey y J.C. Sáenz, (Eds.). Editorial INBio ISBN 978-9968-927-29-1.

* * *

MONITORING OF DIURNAL RAPTORS IN THE GUARTELÁ STATE PARK REGION, TIBAGI, PARANÁ, BRAZIL

By **Pedro Scherer Neto¹**, **Adriano Travassos¹**, **Antenor Silva Júnior^{1,2}**, **Romulo Cicero Silva¹**, **Tony A. Bichinsky Teixeira¹**, **Luiz Fernando F. de Macedo¹**, **Valdi Paula Gonçalves¹**, **Bruno Henrique C. Grolli¹**, **Leonel Andermann¹**, **Louri Klemann Júnior³**, **Alberto Urben Filho¹**, **André Pelanda¹**, and **Alessandro R. Carneiro¹**

¹PSN A Foundation

²Museu de História Natural “Capão da Imbuia”

³Universidade do Estado do Amazonas
e-mail: pedroschererneto@yahoo.com.br

Birds of prey occupy diverse biomes and habitats (Saggese 2021) and among the many factors that contribute to their appearance in a given region are landscape characteristics and the presence of food resources. In heterogeneous habitats there is greater prey diversity (Gamauf et al. 1998, Tews et al. 2004, Stein et al. 2014), which consequently translates into greater raptor richness. Areas with large rock walls can provide shelter, feeding, and breeding sites for several species of raptors (Djorgova et al. 2021, Diniz-Filho et al. 2022).

In Brazil, there are 72 species of diurnal raptors, of which 5 belong to the order Cathartiformes (Cathartidae = 5), 47 to the order Accipitriformes (Pandionidae = 1, Accipitridae = 46) and 20 to the order Falconiformes, all from the family Falconidae (Pacheco et al. 2021, Pallinger and Menq

2021). Of these, 52 species are found in the southern region in the Atlantic Forest, including the states of Paraná, Santa Catarina, and Rio Grande do Sul (Benke et al. 2010, Scherer-Neto et al. 2011, 2012, Bege 2012).

In Brazil, six species of diurnal raptors are on the endangered species list (MMA 2022). In Paraná, there are 11 species included in some threat category. Five species are categorized as Vulnerable (VU), two as Endangered (EN) and four are categorized as Critically Endangered (CR) (PARANÁ 2018). In the central-eastern region of the state of Paraná, located in the middle region of the Devonian Escarpment, the steep valleys of the Iapó River are home to the Parque Estadual Guartelá (PEG). This rock formation presents a high heterogeneity of habitats, alternating mixed forests, natural and artificial fields, forming a unique

landscape that maintains a high diversity raptor species (Scherer-Neto et al. 2011a). Our work aims to understand and monitor the assemblage of diurnal raptors, including scavengers, in this conservation unit.

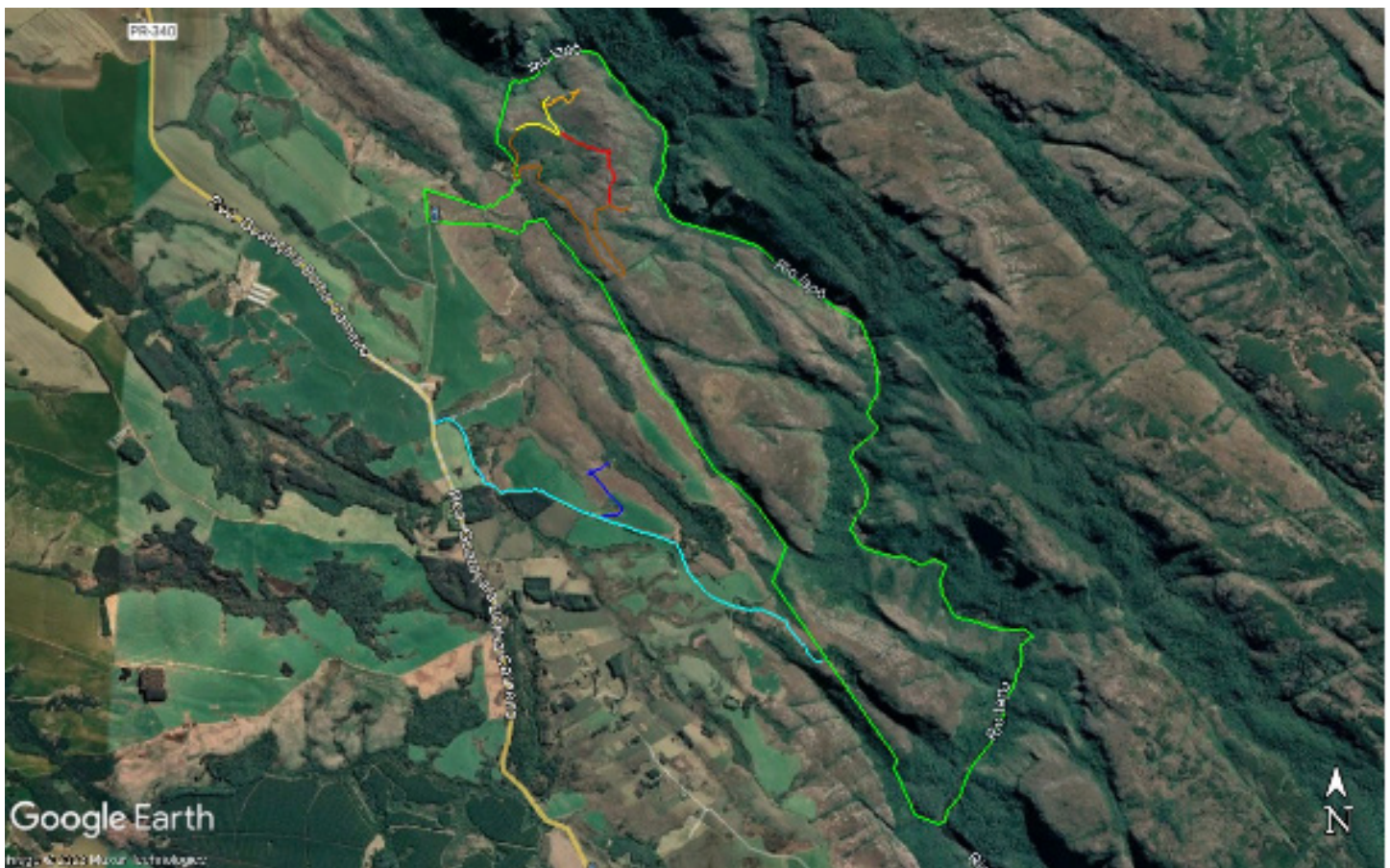
Methods

This research was carried out in the PEG and its surroundings, in the Municipality of Tibagi, state of Paraná, central eastern region of Campos Gerais do Paraná (24° 34'S; 50° 14'W). The park has an area of 798.97 ha, with an average altitude of 1047m (800 to 1200m) and is managed by the Institute of Water and Land (IAT), having been created by State Decree 1229 of

03/27/1982. The climate is Cfb type (humid subtropical climate), with a long, temperate and humid summer which lasts from September to March, and a short winter from April to August. The mean annual precipitation is 137.1 cm and the temperature varies from 12 °C to 28 °C and is rarely lower than 7 °C or higher than 31 °C (Maak 1981).

The PEG is crossed by the Iapó River Canyon, where the vegetation cover is formed by mixed humid forest on the slopes and, in the upper regions, forest thickets dominated by araucaria, natural grasslands, and Cerrado patches (Figure 1).

Figure 1. Boundaries of the Guartelá State Park (PEG), showing the trails followed during the research period.



We monitored diurnal birds of prey by identifying and counting all individuals seen in the park and its immediate surroundings. We carried out from one to four annual samplings between 2014 and 2023, totaling 25 field surveys. Initially, stationary observation points and pre-existing trails were defined for an active search, which were maintained during all field surveys.

During the stationary observations, the team, made up of six people, positioned themselves at pre-established points on the edge of the canyons, on sandstone outcroppings, with a wide view of the landscape. At these points the observers remained from 09:00 to 12:00 hrs. and from 15:00 to 18:00 hrs., with a sampling effort of six hours per day. Each field survey totaled 12 hours/observer, totaling 72 hours of data collection. At the end, the number of species and individuals observed was calculated.

During the active searches, the observers remained in constant movement on foot along pre-existing trails, or by car at low speed (~20 km/h), along secondary roads. The observers carried binoculars (8x42), a zoom camera, and a field book where the following variables were recorded: date, time, species, age (juvenile or adult), sex (when possible), and number of individuals observed at the same time. At the end of each day, the information was included in field spreadsheets prepared by each of the observers. Considering that many species cover a large area in flight, we sought

to minimize the risk of the same individual being recorded more than once. To do this, we compared the spreadsheets, and any records obtained at the same time by more than one observer were discarded, leaving only one of the records.

Results

We documented 2,707 records for 32 species of diurnal birds of prey belonging to the families Cathartidae, Accipitridae, and Falconidae. These records represent approximately 80% of the diurnal raptor species that occur in the state of Paraná (Scherer-Neto et al. 2011b) (Table 1).

The Cathartidae family was represented by four species, with records dating back to 1978 (Figure 2). Notably, the King Vulture's (*Sarcoramphus papa*) presence in the Iapó River Valley has been documented since early research at the PEG, beginning in 1992 (Scherer-Neto et al. 2011a). Its presence is possibly due to the reproduction, roosting, and feeding opportunities existing in the park. The species had a frequency of occurrence of 100% and a large variation in the number of individuals throughout the sampling, which ranged from two individuals observed in 2014, to 126 in December 2021 (Appendix). Fourteen juvenile and immature individuals were also recorded, possibly an indication that the species breeds on the rocky cliffs of the Iapó River Valley, although no nests were found.

Table 1. Species richness and annual and total records of diurnal birds of prey in the PEG

Families	Species	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	REC
Cathartidae	<i>Sarcorampus papa</i>	15	13	13	95	38	04	26	210	22	26	462
Cathartidae	<i>Coragyps atratus</i>	34					27	22	224	59	48	414
Cathartidae	<i>Cathartes aura</i>	112	84	128	130	105	61	34	269	76	69	1068
Cathartidae	<i>Cathartes burrovianus</i>	02										02
												1946
Accipitridae	<i>Elanus leucurus</i>	01	02	02	03	02			06	01		17
Accipitridae	<i>Leptodon cayenensis</i>				02							02
Accipitridae	<i>Elanoides forficatus</i>		02						20		09	31
Accipitridae	<i>Spizaetus tyrannus</i>	01			02				01			04
Accipitridae	<i>Harpagus diodon</i>					01			02			03
Accipitridae	<i>Ictinia plumbea</i>			02	05	05			02		03	17
Accipitridae	<i>Circus buffoni</i>			01								01
Accipitridae	<i>Accipiter striatus</i>		01		02				01	01		05
Accipitridae	<i>Accipiter bicolor</i>				02							02
Accipitridae	<i>Geranoospiza caerulescens</i>	01				01			03	01	01	07
Accipitridae	<i>Buteogallus coronatus</i>		01		06	05			03	04		19
Accipitridae	<i>Heterospizias meridionalis</i>				01	01	01	01	03	01	01	09
Accipitridae	<i>Rupornis magnirostris</i>	05	01	10	15	04	04	03	11	06	08	67
Accipitridae	<i>Parabuteo leucorrhous</i>	03		01			01					05
Accipitridae	<i>Geranoaetus albicaudatus</i>	01			03				12			16
Accipitridae	<i>Geranoaetus melanoleucus</i>	05	01	12	10	09	04	03	17	05	08	74
Accipitridae	<i>Buteo brachyurus</i>	06	01	07	04	01	02	01	06	04	04	36
Accipitridae	<i>Buteo albonotatus</i>		02									02
												317
Falconidae	<i>Herpetoteres cachinnans</i>	03			02	03	02		02	01	01	14
Falconidae	<i>Micrastur ruficollis</i>		01			01						02
Falconidae	<i>Micrastur semitorquatus</i>	01		01					02			04
Falconidae	<i>Caracara plancus</i>	19		02	15	31	71	21	95	43	18	315
Falconidae	<i>Milvago chimachima</i>	02	02	05	05	03	02	01	04	08	05	37
Falconidae	<i>Milvago chimango</i>				01			02	03	02	02	10
Falconidae	<i>Falco sparverius</i>	01	02	06	03	03		03	03	02	01	24
Falconidae	<i>Falco rufigularis</i>	01										01
Falconidae	<i>Falco femoralis</i>	04	01		03	02		01	03	02		16
Falconidae	<i>Falco peregrinus</i>	05	03	01	03	03			05		01	21
												444
TOTAL RECORDS												2707

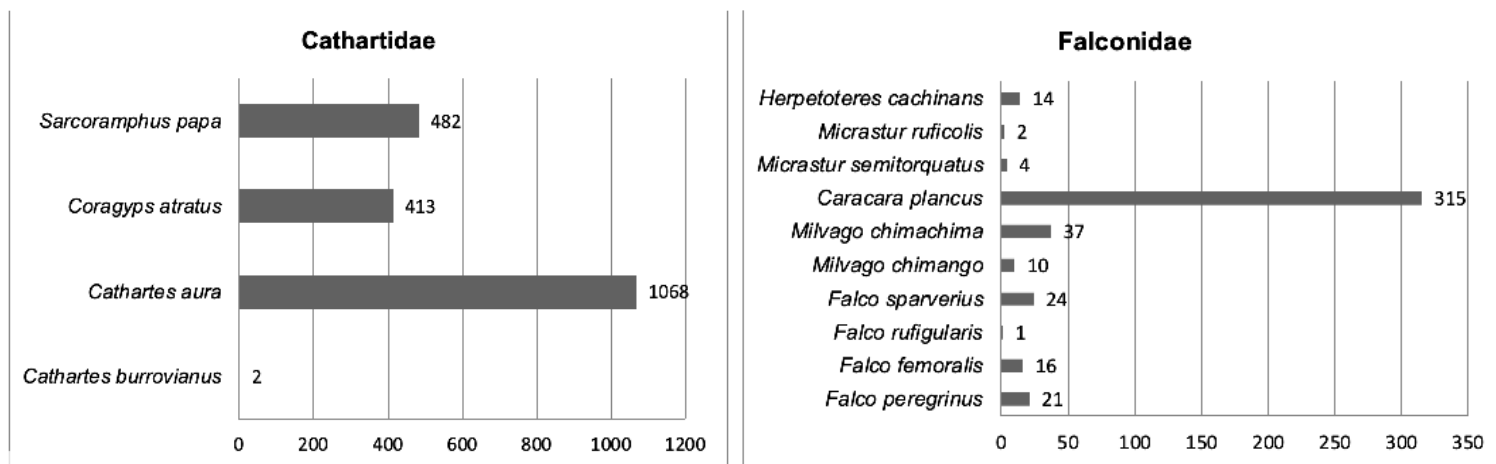


Figure 2 (Left). Species richness of the Cathartidae family and number of records in the PE do Guartelá.

Figure 3 (Right). Species of the Falconidae family and number of records in PE do Guartelá.

Other species stood out for their abundance, such as the Turkey Vulture (*Cathartes aura*), which was recorded in all samplings with quantities between 14 and 105 individuals (Appendix). The appearance of the Black Vulture (*Coragyps atratus*) was rare at the beginning of this research, since in addition to being opportunistic, this vulture preferentially frequents anthropic environments. It was not recorded for four years in the study area. However, it was observed near cities and milk-production factories, where it takes advantage of the discarded organic material.

The Falconidae family was represented by 10 species, with 444 records (Figure 3). The most common species were the Crested Caracara (*Caracara plancus*) and the Yellow-headed Caracara (*Milvago chimachima*). The latter species is common in fields being prepared for sowing grains, when small animals, such as invertebrates, are exposed.

The four species of the genus *Falco* that occur in Paraná according to Scherer-Neto et al (2011b) were recorded in the PEG. Of note, in November 2014, five individuals of the migratory Peregrine Falcon (*Falco peregrinus*) were observed, which is unusual for this species as they are usually seen in pairs or alone. It is worth mentioning that there was only one record of Bat Falcon (*Falco rufigularis*), despite it being an easy species to observe.

The highest number of species (18) were in the Accipitridae family (Figure 4), though with a lower abundance of individuals, with a total of 317 records obtained during the entire sampling period. We recorded 16 species of falcons and two species of eagles, which corresponds to 50% of those that occur in the entire state of Paraná. The detection of these raptors was occasional, since there are species that inhabit the interior of the forest and others that frequent open areas, requiring us to identify species by vocalizations, in addition to

visual observations. The Black-chested Buzzard-eagle (*Geranoaetus melanoleucus*) and the Chaco Eagle (*Buteogallus coronatus*) are two species of interest. The former is considered common and was recorded in all years. It was observed in flight and perched on trees, rocks, or electrical transmission towers in the region (Figure 5).

The Chaco Eagle is an endangered species (CR) in Brazil (MMA 2022) and in the state of Paraná (Paraná 2018). Its population in the macroregion of this study does not exceed 20 individuals (T. Bichinski and P. Scherer-Neto pers. obs.). In this study, it was seen in six years with up to four individuals simultaneously in August 2022. We documented its presence while the species was in flight or perched on power transmission towers, on rocks, or in trees (Figure 6).

Other species of the Accipitridae family were only observed occasionally, with the exception of the Roadside Hawk (*Rupornis magnirostris*) and the Short-tailed Hawk (*Buteo brachyurus*), which were recorded in most of the samplings. Among the sporadic records, some forest species stand out such as the Gray-headed Kite (*Leptodon cayenensis*), the White-rumped Hawk (*Parabuteo leucorrhous*), the Zone-tailed Hawk (*Buteo albonotatus*) and the Black Hawk-eagle (*Spizaetus tyrannus*), the last two which were seen in flight, taking advantage of thermal currents.

The landscape changes caused by the transformation of natural fields into extensive cereal crops negatively influenced the appearance of species from open areas such as the Savanna Hawk (*Heterospizias meridionalis*) and the White-tailed Hawk (*Geranoaetus albicaudatus*), which practically dis-

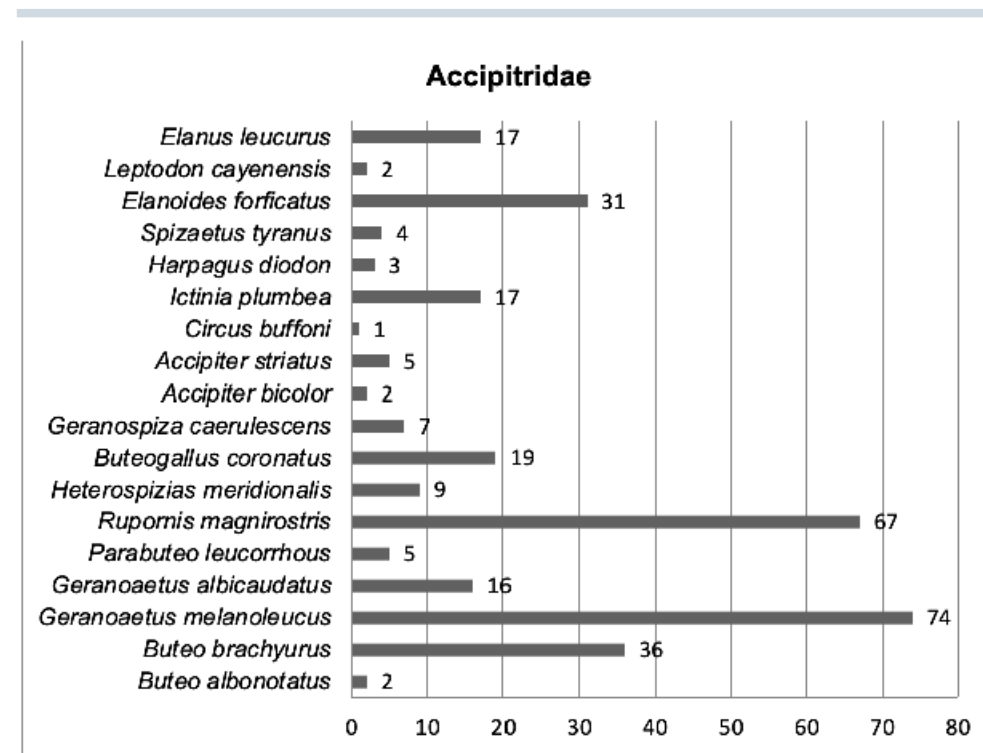


Figure 4. Species of the family Accipitridae and number of records in the PE of Guartelá.



Figure 5. Black-chested Buzzard-eagles perched on a power transmission tower on the outskirts of PEG
Photo © Alessandro R. Carneiro

appeared from the PEG. The Swallow-tailed Kite (*Elanoides forficatus*) and the Plumbeous Kite (*Ictinia plumbea*), both migratory species, were present in the region in the months of September, October, and March. In March, they begin returning to the Amazon region (Pallinger and Menq 2021).

In the field, a long reproductive period of eight months was observed for diurnal raptor species in the study region. Starting in June, when winter begins, so do courting behaviors. In July, the laying and incubation of eggs occurs, with hatchings taking place in the following months, culminating with the departure of the fledglings from the nests from the beginning of summer and ending in January. Therefore, the reproductive period

covers three winter months (June to August) and five summer months (September to January). Parental care was also prolonged, with juvenile and immature individuals observed together with their parents. However, there is no precise information on the time that the juveniles remain under parental care (Figure 8).

Aspects of Conservation

A conservation unit, no matter where it is located, is recognized for its importance due to the quantity and quality of information about its natural resources. The PEG is an example of an area important for the maintenance of regional fauna and flora and the protection of a set of environments that form a unique landscape.



Figura 6. A Chaco Eagle perched on a power transmission tower outside of PEG Photo © Alessandro R. Carneiro

The topographic characteristics of the Iapó River Valley, where the park is located, allow soaring birds of prey to search for food, and crevices in large rocks serve as important nesting areas, since some species deposit their eggs in these cavities where they incubate and raise their young, as observed in some species of the Cathartidae family. Furthermore, the PEG presents favorable conditions for research on avifauna in general, such as those begun in 1992 (Scherer-Neto et al. 2011a), with a subsequent emphasis on diurnal birds of prey starting in 2014.

The presence of the Choco Eagle within the PEG raptor community is important. It is a rare and endangered species that lives in open areas where it searches for food, and it often uses the

electrical grid as a resting point, which facilitated our observations in this study. In Paraná, little is known about this eagle. It is essential to deepen our knowledge about its habits, diet, reproduction, and the approximate size of the population that inhabits the park and its surroundings, as well as in other regions of the state with a similar landscape (for example, in the municipalities of Jaguariaíva, Arapoti and Pirai do Sul).

We documented the most emblematic species of the PEG, the King Vulture, during all surveys. Observations of this species were possible from any point in the park, and it was observed both in flight taking advantage of the thermal currents, and perched on rock walls and in leafy trees on both banks of the Iapó River.



Figure 7. Adult and juvenile King Vultures recorded in the PEG Photo © Alessandro R. Carneiro

Birds of prey, in general, are excellent bioindicators of habitat quality and despite the importance of increasing our knowledge about this group, basic research focused on raptors is still scarce. Some important work being carried out in other places in Brazil, such as the “Harpia Project”, coordinated by the researcher Dr. Tania Sanaïotti of the National Institute of Amazonian Research – INPA, also highlights research in the state of Minas Gerais (Zilio 2012, Zorzin et al 2022) and in Rio Grande do Sul (Kilpp 2020).

It is, therefore, essential to continue to expand these studies and increase both *in* and *ex situ* conservation efforts of this important group of birds, which is threatened by loss of habitat, hunting, capture, commercialization, and persecution due to alleged losses caused by attacks on domestic animals.

Appendix. Species richness and abundance of diurnal birds of prey in Guartelá State Park

Families	Species	2014				2015		2016			2017			
		MAR	APR	JUL	NOV	FEB	SEP	MAR	JUL	OCT	JAN	JUN	SEP	DEC
Cathartidae	<i>Sarcorampus papa</i>	02	02	32	11	02	11	04	05	04	06	03	60	26
Cathartidae	<i>Conagyps atratus</i>				02									
Cathartidae	<i>Cathartes aura</i>	16	33	35	28	70	14	34	32	62	20	25	41	44
Cathartidae	<i>Cathartes burrovianus</i>	01			01									
Accipitridae	<i>Elanus leucurus</i>		01			01	01	01		01	03			
Accipitridae	<i>Leptodon cayenensis</i>										02			
Accipitridae	<i>Elanoides forficatus</i>						02							
Accipitridae	<i>Spizaetus tyrannus</i>				01									
Accipitridae	<i>Harpagus diodon</i>													
Accipitridae	<i>Ictinia plumbea</i>							01		01			05	
Accipitridae	<i>Circus buffoni</i>							01						
Accipitridae	<i>Accipiter striatus</i>						01							02
Accipitridae	<i>Accipiter bicolor</i>													02
Accipitridae	<i>Geranospiza caerulescens</i>			01										
Accipitridae	<i>Heterospizias meridionalis</i>							01						01
Accipitridae	<i>Buteogallus coronatus</i>						01					04	01	01
Accipitridae	<i>Rupornis magnirostris</i>		01	01	03		01	04	03	03	02	02	09	02
Accipitridae	<i>Parabuteo leucorrhous</i>	01	01	01				01						
Accipitridae	<i>Geranoaetus albicaudatus</i>			01								02		01
Accipitridae	<i>Geranoaetus melanoleucus</i>		02	01	02			06	05	01	01		02	07
Accipitridae	<i>Buteo brachyurus</i>		03	01	02		01	03	03	01	01	01	02	02
Accipitridae	<i>Buteo albonotatus</i>													
Falconidae	<i>Herpetoteres cachinnans</i>	01	01		01							02		
Falconidae	<i>Micrastur ruficollis</i>						01							
Falconidae	<i>Micrastur semitorquatus</i>			01						01				
Falconidae	<i>Caracara plancus</i>		19							02	01	02	05	07
Falconidae	<i>Milvago chimachima</i>				02	03		03		02		01	02	02
Falconidae	<i>Milvago chimango</i>												01	
Falconidae	<i>Falco sparverius</i>			01		01	01	02	02	02	01	01	01	
Falconidae	<i>Falco ruficularis</i>	01												
Falconidae	<i>Falco femoralis</i>		03		01		01					02		01
Falconidae	<i>Falco peregrinus</i>				05	02	01	01						02

Appendix (cont.): Species richness and abundance of diurnal birds of prey in Guartelá State Park

Families	Species	2018			2020	2021				2022		2023	
		MAY	SEP	APR	OCT	JAN	MAY	SEP	DEC	AUG	NOV	MAR	OCT
Cathartidae	<i>Sarcoramphus papa</i>	10	28	04	26	08	09	67	126	09	13	04	22
Cathartidae	<i>Coragyps atratus</i>			27	22	27	41	34	122	48	11	09	39
Cathartidae	<i>Cathartes aura</i>	41	64	61	34	30	53	81	105	61	15	27	42
Cathartidae	<i>Cathartes burrovianus</i>												
Accipitridae	<i>Elanus leucurus</i>		02			02		02	02	01			
Accipitridae	<i>Leptodon cayenensis</i>												
Accipitridae	<i>Elanoides forficatus</i>					10		10				09	
Accipitridae	<i>Spizaetus tyranus</i>							01					
Accipitridae	<i>Harpagus diodon</i>		01			01		01					
Accipitridae	<i>Ictinia plumbea</i>		05					01	01				03
Accipitridae	<i>Circus buffoni</i>												
Accipitridae	<i>Accipiter striatus</i>							01		01			
Accipitridae	<i>Accipiter bicolor</i>												
Accipitridae	<i>Geranospiza caerulescens</i>		01				02	01		01			01
Accipitridae	<i>Heterospizias meridionalis</i>			01	01	01		01	01	01		01	
Accipitridae	<i>Buteogallus coronatus</i>	02	03				01	01	01	04			
Accipitridae	<i>Rupornis magnirostris</i>	02	02	04	03	01	05	04	01	03	03	05	03
Accipitridae	<i>Parabuteo leucorrhous</i>			01									
Accipitridae	<i>Geranoaetus melanoleucus</i>	02	07	04	03	05	05	01	06	03	02	03	05
Accipitridae	<i>Geranoaetus albicaudatus</i>					03	02	01	06				
Accipitridae	<i>Buteo brachyurus</i>		01	02	01	03		01	02	03	01	02	02
Accipitridae	<i>Buteo albonotatus</i>												
Falconidae	<i>Herpetoteres cachinnans</i>	03		02		01		01		01			01
Falconidae	<i>Micrastur ruficollis</i>	01											
Falconidae	<i>Micrastur semitorquatus</i>						01		01				
Falconidae	<i>Caracara plancus</i>	28	03	71	21	29	24	17	26	34	09	03	15
Falconidae	<i>Milvago chimachima</i>	01	02	02	01		02		02	04	04	02	03
Falconidae	<i>Milvago chimango</i>				02		02		01		02	02	
Falconidae	<i>Falco sparverius</i>		03		03	01		02		01	01		01
Falconidae	<i>Falco ruficularis</i>												
Falconidae	<i>Falco femoralis</i>		02		01	02		01		02			
Falconidae	<i>Falco peregrinus</i>	01	02			02		01	02			01	

Acknowledgments

This research had the special participation of Professor Maria Cecilia B. de Toledo, Williams R. Mendonça and Mauro de Moura Britto, William and Jessica Menq, Ronny Sperber, Glauco Oliveira, Harrison Luís and Jonas Kilpp in various field phases. We thank the person in charge of the Guartelá State Park at the beginning of the work, Cristovam Sabino Queiroz; to Gelson (Baiano) de Oliveira and the current coach Juárez Baskoski, for their attention in recent years. We extend our gratitude to the park employees who always provided important information about birds of prey in the study region. We thank the “Capão da Imbuia” Natural History Museum for its support since the beginning of research on the avifauna of this conservation unit. And, finally, we could not fail to thank the Água e Terra Institute - IAT, for the opportunity to work on this magnificent conservation unit. Support: Instituto Água e Terra – IAT, Museu de História Natural Capão da Imbuia, PSN A Foundation. Coordination: Pedro Scherer-Neto – Honorary Ornithologist/Biologist

References

- Bege, L. A. do R. 2012. As aves em Santa Catarina: distribuição geográfica e meio ambiente. Fundação do Meio Ambiente, Ed. 326 p.
- Bencke, G. A., R. A. Dias, L. Bugoni, C. E. Agne, C. Fontana, G. N. Maurício and D. Machado. 2010. Revisão e atualização da lista das aves do Rio Grande do Sul. *Iheringia. Série Zoologia* 100: 519 - 556.
- Diniz-Filho, J. A. F., C. E. R. de Sant’Ana, M. C. de Souza, T. F. Rangel. 2002. Null models and spatial patterns of species richness in South American birds of prey. *Ecology Letters*, 5 (1): 47- 55.
- Djorgova, N., D. Ragyov, V. Biserkov, J. Biserkov, B. P. Nikolov. 2021. Habitat preferences of diurnal raptors in relation to human access to their breeding territories in the Balkan Mountain Range, Bulgaria. *Avian Research*, 12 (1): 1 - 10.
- Gamauf, A.; M. Preleuthner, H. Winkler. 1998. Philippine birds of prey: interrelations among habitat, morphology, and behavior. *The Auk*, 115 (3): 713 - 726.
- Kilpp, J. C. 2020. Uso do solo nos campos de altitude do Rio Grande do Sul e a composição de aves de rapina diurnas. Dissertação de Mestrado. Universidade Estadual do Rio Grande do Sul – Unidade São Francisco de Paula. São Francisco de Paula, RS. 66 p.
- Maak, R. 1968. Geografia do Estado do Paraná. Curitiba, Universidade Federal do Paraná. 350 p.
- MMA 2022: Ministério do Meio Ambiente – MMA 2022. Portaria MMA No 148. Altera os Anexos da Portaria nº 443, de 17 de dezembro de 2014, da Portaria nº 444, de 17 de dezembro de 2014, e da Portaria nº 445, de 17 de dezembro de 2014, referentes à atualização da Lista Nacional de Espécies Ameaçadas de Extinção. *Diário Oficial da União*. Edição 108, seção 1, página 74. Publicado em 08/06/2022. Brasília (DF): Ministério do Meio Ambiente. Disponível em: [http:// www.in.gov.br/en/web/dou/-/portaria-](http://www.in.gov.br/en/web/dou/-/portaria-)

mma-n-148-de-7-de-junho-de-2022-406272733
[Acesso em 11 junho 2022]

Pacheco, J. F., F. L. Silveira, A. Aleixo, C. E. Agne, G. A. Bencke, G. A. Bravo, G. R. R. Brito, M. Cohn-Haft, G. N. Maurício, L. N. Naka, F. Olmos, S. Posso, A. C. Lees, L. F. A. Figueiredo, E. Carrano, R. C. Guedes, E. Cesari, I. Franz, F. Schunck, e V. Q. Piacentini. 2021. Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee – second edition. *Ornithology Research* 29: 94 – 105.

Pallinger, F., W. Menq. 2021. *Aves de Rapina do Brasil: volume I: diurnos*. São Paulo. Ed. do Autor. 184 p.

Paraná, 2018. Reconhece e atualiza a Lista de Espécies de Aves pertencentes à Fauna Silvestre Ameaçadas de Extinção no Estado do Paraná e dá outras providências, atendendo o Decreto nº 3.148, de 2004. Decreto Nº 11797 DE 22/11/2018. Disponível em: <https://www.legisweb.com.br/legislacao/?id=369613>. Acessado em Dezembro de 2023.

Saggese, M. D. 2021. Neotropical Raptors: Promoting Research and Advancing Conservation in the 21st Century. *Journal of Raptor Research*, 55 (2): 137-138.

Scherer-Neto, P., E. Carrano, M. de Moura-Britto, F. Girardi, L. Klemann-Júnior, R. Amorim, G. de La Torre, L. F. F. de Macedo. 2011a. Atualização do conhecimento sobre a avifauna do Parque Estadual do Guartelá, Paraná, Brasil. In: CARPANEZZI, O.T.B. & CAMPOS, J.B. (org.). *Coletânea de Pesquisas*.

Parques Estaduais de Vila Velha, Cerrado e Guartelá. IAP – Instituto Ambiental do Paraná. Curitiba, PR.

Scherer-Neto, P., F. C. Straube, E. Carrano, A. Urben-Filho. 2011b. Lista das Aves do Paraná: edição comemorativa do centenário da ornitologia do Paraná. *Hori Cadernos Técnicos* 2. Curitiba, PR. 130 p.

Stein, A.; K. Gerstner; H. Kreft. 2014. Environmental heterogeneity as a universal driver of species richness across taxa, biomes and spatial scales. *Ecology letters* 17 (7): 866 - 880.

Tews. K.; U. Brouse; V. Grimm; K. Tielbörger, K.; M.C. Wichmann; M. Schwager; F. Jeltsch. 2004. Animal species diversity driven by habitat heterogeneity/diversity: the importance of keystone structures. *Journal of biogeography* 31 (1):79 - 92.

Zilio, F. 2012. Composição e diversidade de taxocenos de aves de rapina diurnas de paisagens abertas da Savana Uruguaia e Floresta Úmida com Araucária. Tese de Doutorado. Universidade Federal do Rio Grande do Sul. Porto Alegre, RS. 184 p.

Zorzin, G., E. P. M. de Carvalho-Filho, R.G. Armondi. 2022. Density, Distribution, and Conservation of the Chaco Eagle (*Buteogallus coronatus*) in Minas Gerais, South of Brazil. *Historia Natural. Terceira Serie*. Vol. 12 (2): 111 - 124.

* * *

EXPANSION OF THE AREA OF DISTRIBUTION AND ALTITUDINAL RANGE OF THE BAT FALCON (*FALCO RUFIGULARIS*) IN MEXICO

By **Jesús Favela-Mesta**

¹Secretaría de Turismo del Estado de Durango. Florida 1106 Pte. Barrio del Calvario, Zona Centro,
Victoria de Durango, Dgo. México, C.P. 34000
E-mail: jesfav28@gmail.com

Various factors can generate changes in the distribution of raptors, among which are habitat alterations and climate change (Vázquez-Pérez et al. 2009; Martínez-Ruiz et al. 2023). Likewise, it has been reported that raptor richness and abundance decreases with altitude, with a greater reduction from 1,500 to 3,000 meters above sea level. This pattern is more evident in falcons (Falconidae), mainly due to the homogeneity and availability of habitats (Terborgh 1977, Márquez et al. 2005, Rodríguez et al. 2018).

The Bat Falcon (*Falco rufigularis*) is a Neotropical raptor that is distributed from the coasts of Mexico to southern Argentina, covering an area of approximately 21,700,000 km² within which it is considered resident (BirdLife 2024). It lives in humid lowlands, dry tropical, subtropical and temperate forests, grasslands, and rural and urban areas from sea level to 1,700 m (Ferguson-Lees and

Christie 2001, Clark and Schmitt 2017, BirdLife 2024). It has crepuscular habits and feeds mainly on small birds, bats, and large insects that it hunts in flight over the canopy and open areas within a radius of 100 m (Ferguson-Lees and Christie 2001, Macouzet 2007). It begins breeding between February-March. It nests in natural tree cavities, in ravines, and in nests built by other birds. Due to its wide geographic distribution, the species is not globally threatened, although it has disappeared from some highly disturbed areas (Macouzet 2007). Currently, its population size is estimated at approximately 500,000-4,999,999 individuals (BirdLife 2024).

In Mexico, its distribution covers the Pacific slope from southern Sonora to Chiapas, where it is considered rare, and the Atlantic slope from eastern Nuevo León and Tamaulipas to the Yucatán Peninsula, where it is considered common (Howell and Webb 1995). It prefers

forest edges, clearings, and open areas with scattered trees. It frequently perches in dead trees and near bodies of water (Peterson and Chalif 1989). Using information derived from citizen science and field observations, in this work I report and analyze new records of the Bat Falcon. These observations indicate an expansion of its distribution and the known altitudinal range for the species in Mexico.

Methodology

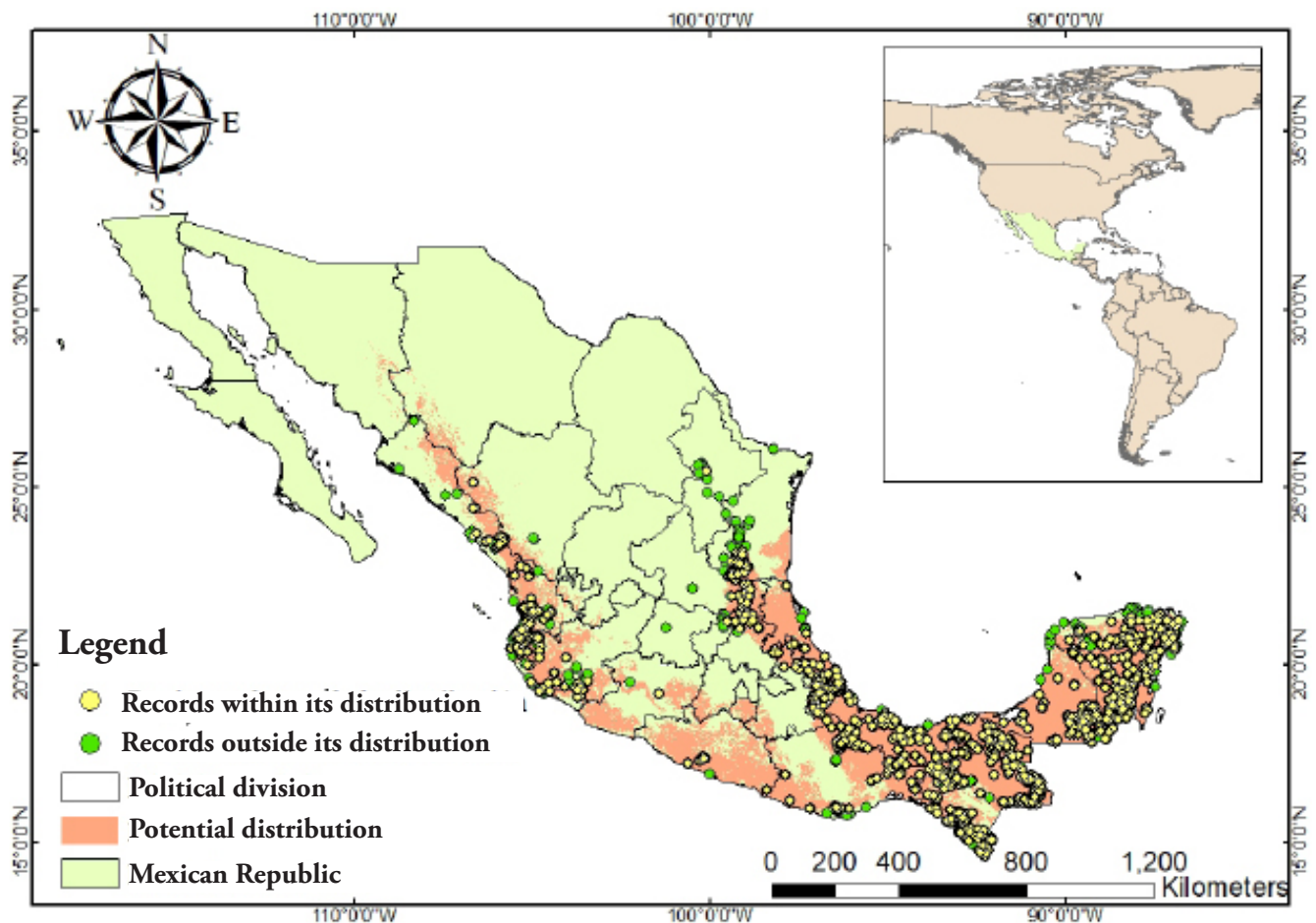
Data Analysis

To determine the current distribution of the Bat Falcon in Mexico, I obtained the historical records for the species both on the mainland and

on surrounding islands, using the citizen science platform eBird (2024). Then, to determine the breadth of the range, I compared the location of the records obtained with the potential distribution of the species proposed by Navarro and Peterson (2007) and Navarro et al. (2018).

I made a map contrasting records outside the potential distribution area and calculated the number and percentage of records, the occupied area in km², and the corresponding percentage for each state. Likewise, for each slope (Pacific and Gulf) I determined the area in km² and its percentage. Then, using a digital elevation model, I made a map of the area with the largest

Figure 1. Potential distribution of *Falco ruficularis* and records inside and outside said distribution in Mexico



number of records outside the Bat Falcon's potential distribution. This approach is useful for determining landscape elements that may influence range breadth (e.g., mountain ranges). Finally, to determine the altitude more accurately, I compared the records with respect to the contour lines using a map and made elevation profiles using the Google Earth Pro (2022) program.

For the records outside its distribution and at higher altitudes, as well as the most distant ones, I calculated their distance from the closest potential distribution, taking into account the base maps of Navarro and Peterson (2007) and Navarro et al. (2018). All analyses were carried out

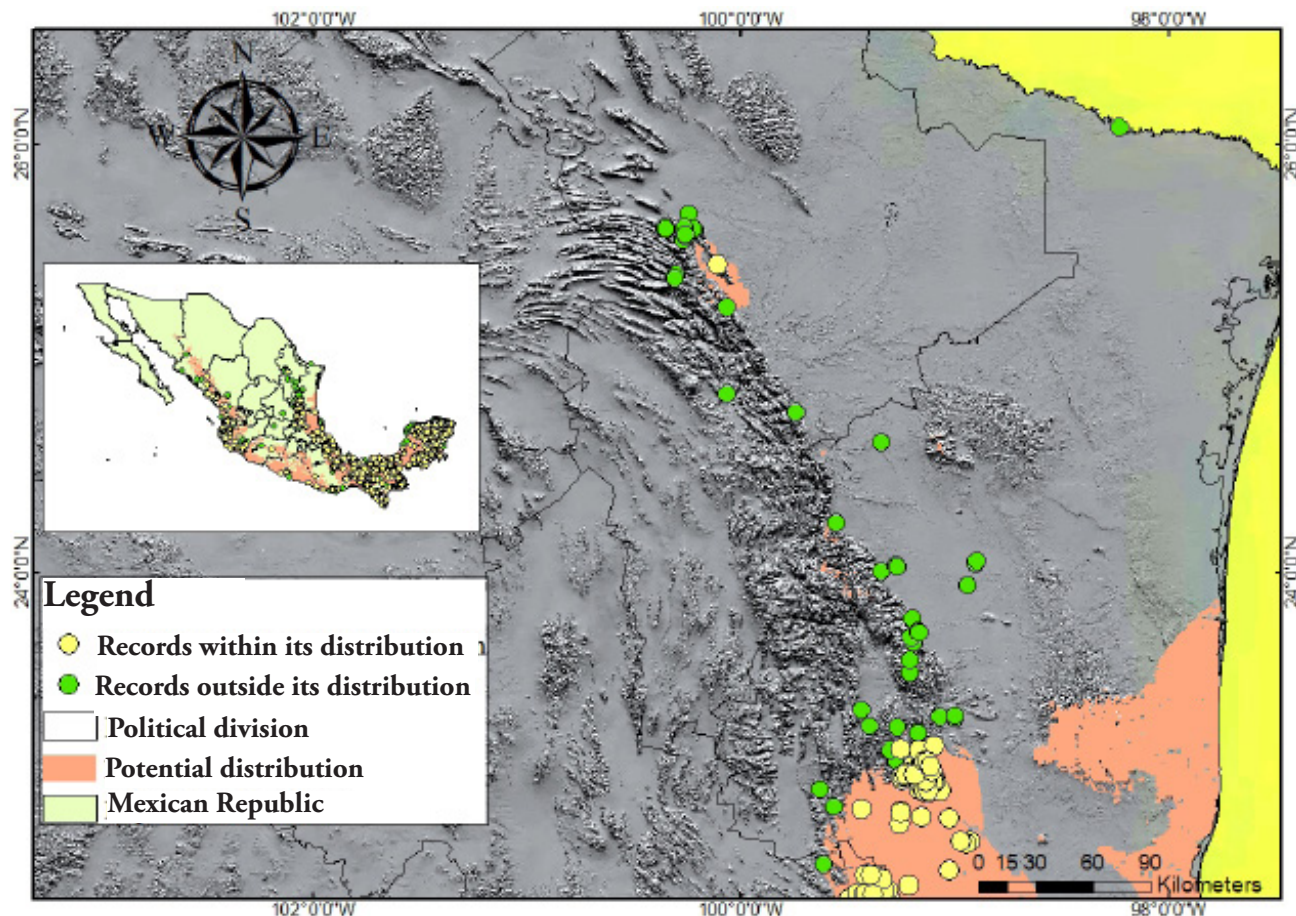
using the ArcMap 10.8 program (ArcGis 2021) and the layers used were downloaded from the CONABIO Geoportal (2018).

Field Work

During 1, 2, and 3 July 2019, I visited the Salto del Agua Llovida to conduct field work. The objective was to carry out transects of five hours (08:00-13:00) to record individual Bat Falcons.

This site is located in the Sierra Madre Occidental region, in the Mexican state of Durango, southwest of the municipality of Durango (23°32'20.44"N, 104°57'22.22"W). The area is known as Sierra del Nayar and its topography is very rugged, with small ravines, high-altitude

Figure 2. Area with the greatest number of records of *Falco ruficularis* outside its distribution.



State	Records	Percentage	Area	Percentage
Campeche	244	6.94	53378.65	9.95
Chiapas	776	22.07	63458.95	11.82
Chihuahua	0	0.00	6196.69	1.15
Colima	21	0.60	3260.53	0.61
Durango	4	0.11	12898.06	2.40
Guanajuato	1	0.03	0.63	0.00
Guerrero	17	0.48	44550.69	8.30
Hidalgo	8	0.23	5822.92	1.08
Jalisco	189	5.38	30254.61	5.64
México	0	0.00	4004.64	0.75
Michoacán de Ocampo	2	0.06	19976.52	3.72
Morelos	0	0.00	3162.03	0.59
Nayarit	395	11.23	18726.09	3.49
Nuevo León	20	0.57	328.53	0.06
Oaxaca	158	4.49	55452.56	10.33
Puebla	13	0.37	11054.32	2.06
Querétaro de Arteaga	21	0.60	1844.17	0.34
Quintan Roo	367	10.44	41464.40	7.73
San Luis Potosí	70	1.99	11715.42	2.18
Sinaloa	94	2.67	18024.85	3.36
Sonora	0	0.00	1641.00	0.31
Tabasco	99	2.82	24313.45	4.53
Tamaulipas	162	4.61	11584.97	2.16
Veracruz de Ignacio de la Llave	538	15.30	65815.96	12.26
Yucatán	317	9.02	27266.53	5.08
Zacatecas	0	0.00	478.04	0.09
Total	3516	100	536675.22	100

Table 1. Distribution of *Falco ruficularis* in Mexico, the number of records and distribution area is indicated, as well as their respective percentages by state.

ravines, and plateaus with an altitude between 2,000 and 2,700 meters above sea level. The Salto del Agua Llovida stream forms a 96 m waterfall that bears the same name and flows in a ravine that continues along the riverbed (Hernández et al. 2007).

Results

I obtained a total of 3,516 records for Mexico, of

which 496 (14%) are outside the known range. The states with the greatest number of records were Chiapas (776; 22%), Veracruz (538; 15%), and Nayarit (395; 11%).

When looking at potential distribution, I estimated an area of 536,675 km². The states with the largest distribution areas are Veracruz (65,815 km²; 12%), Chiapas (63,458 km²;

11%), and Oaxaca (55,452 km²; 10%; Table 1 ; Fig. 1). Regarding the slopes, 47% of the records (1,657) are from the Pacific slope, covering 51% of the area (274,919 km², and 53% of the records (1,859) with 49% of the area, are from the Gulf (261,756 km²). The area with the most records outside the potential distribution corresponds to the southwest of Tamaulipas and the center of Nuevo León (Fig. 2). As for the island territories, I obtained 12 records on the Island of Cozumel, one in Islas Mujeres, in Quintana Roo, and one in Islas Marietas, Nayarit. These islands are located 17, 6 and 7 km, respectively, from the continental territory.

When looking at the altitude and extension of the area, I obtained a field record and identified four more individuals outside of the potential distribution and at elevations greater than 2,000 meters above sea level. One of the records was in the Central Altiplano, two were in the Sierra Madre Oriental, and two in the Sierra Madre

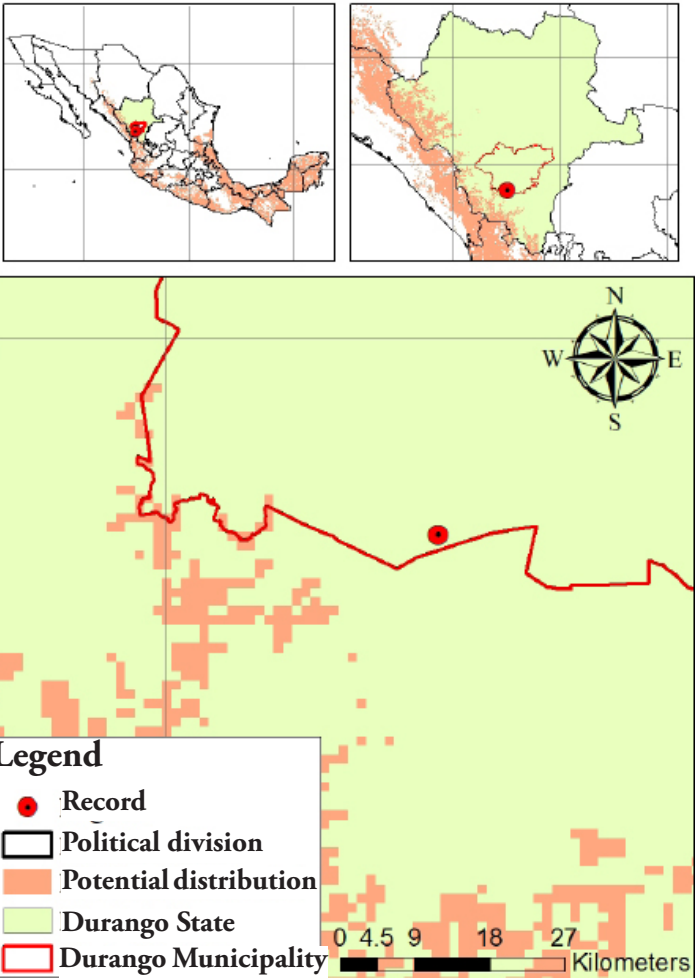


Figure 3. Geographic location of the record of *Falco ruficularis* and its potential distribution in the Sierra Madre Occidental, Durango, Mexico.

Table 2. Records outside the potential distribution area and with a higher altitude, their coordinates, date, individuals, biogeographic province, state, site, altitude and their distance from the potential distribution are indicated.

Records (coordinates)	Date	Individuals	Province	State	Site	Altitude (masl)	Distance from potential distribution
23.5388805 -104.9571186	2/7/2019	3	Sierra Madre Occidental	Durango	Salto del Agua Llovida	2,300	14 km
23.5720869 -104.9737312	6/8/2022	1				2,600	14 km
21.042944 -101.266683	24/9/2021	1	Altiplano Central	Guanajuato	Camino a Santa Ana	2,200	108 km
20.901864 -99.215823	11/6/2000	1	Sierra Madre Oriental	Hidalgo	Parque Nacional Los Mármoles	2,057	6 km
21.094798 -99.664726	13/5/2023	1		Querétaro	Pinal de Amoles	2,700	16 km



Figure 4. Location of record of *Falco rufigularis*, in the Salto del Agua Llovida, Durango, Mexico. Photo © Jesús Favela Mesta, 2019

Occidental, which are among the highest mountain ranges in Mexico (Table 2).

The most distant record corresponds to one located on the border of Mexico and the United States, in the Santa Ana National Wildlife Refuge (southern Texas) at a distance of approximately 183 km from the nearest potential distribution in San Carlos, Tamaulipas. In addition, it is the northernmost record on the Gulf slope. In the Pacific, the northernmost record was located on the borders of Sinaloa and Sonora (Fig. 1). Another record, at a distance of 108 km with respect to the species potential distribution, was from Guanajuato (Table 2).

On 2 July 2019, I observed three adult individuals in the Salto del Agua Llovida ravine. They were hunting, and frequently perched on dead trees. The altitude of said record was 2,300 meters above sea level (Fig. 3, 4, and 5). Additionally, there is another eBird record nearby at an altitude of 2,600 m, which is located 4 km away. These records (field observation and eBird) are located 13.8 and 14.3 km, respectively, from the nearest potential distribution.

Discussion

Although the Bat Falcon is one of the most widely distributed falcons on the American continent (Ferguson-Lees and Christie 2001),

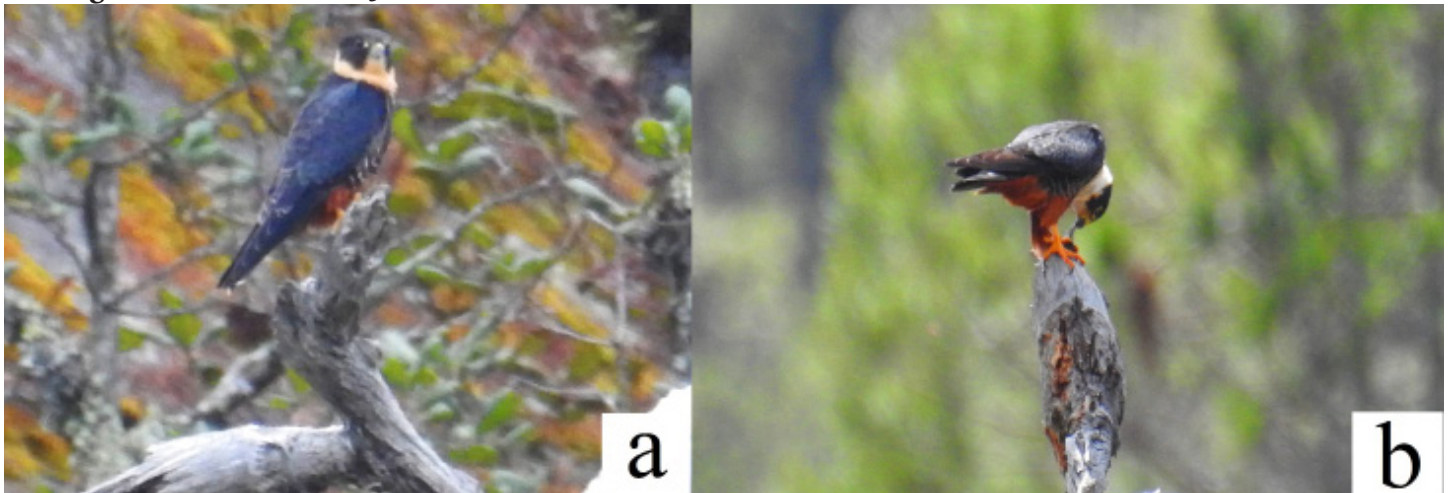
much information about it is still unknown. For example, its distribution and altitude outside their range in certain areas, dispersal to island territories, or local migrations. The records obtained indicate an expansion of its distribution area in certain regions of Mexico. Likewise, the occurrences and distribution of the species were concentrated in the southern states of Mexico. It is possible that these results can be explained by the tendency of the species to select forest ecosystems within the Neotropical region.

The Bat Falcon is a mainly tropical raptor that primarily inhabits undisturbed forests (Márquez et al. 2005). For example, in Colombia it is reported that it is only found in very specific habitats, such as the edges of lowland tropical forest, tropical deciduous forest, and gallery forest. This reaffirms the idea that the species depends on forest edges (Grzimek's 2002). Furthermore, it has been indicated that the Bat

Falcon performs local or irruptive migrations (Márquez et al., 2005), thus it is possible that the species engages in exploratory movements (Castaño and Bildstein 1999). The potential distribution obtained (536,675 km²) represents 2.47% of the total estimated in America (21,700,000 km²; BirdLife 2024).

Regarding the Pacific and Gulf slopes, each had similar percentages in terms of the number of records and distribution area. Regarding the area of southwest Tamaulipas and central Nuevo León, it is possible that the Bat Falcon is expanding its range of distribution through the Sierra Madre Oriental, and it has been described as being able to live in mountainous foothills (Ferguson- Lees and Christie 2001). Individuals have also been reported on several islands. For example, in Mexico, juveniles have mainly been recorded on the island of Cozumel (Ferguson- Lees and Christie 2001).

Figure 5. *Falco rufigularis* perching on a dead tree (a) and consuming prey (b) at Salto del Agua Llovida, Durango, Mexico. Photo © Jesús Favela Mesta, 2019



The records analyzed suggest a new altitudinal range for the species in Mexico, with a maximum of 2,700 meters above sea level on the Gulf slope and 2,600 meters above sea level on the Pacific slope. Indeed, there are records with close altitudes throughout the American continent. For example, for the Andes and Amazon region in Peru, altitudes of 950 to 1,500 meters above sea level are reported (Crespo et al. 2013), in Bolivia 2,100 meters above sea level (Herzog et al. 2016) and in Colombia 2,600 meters above sea level (SAO 2024) have also been reported. The altitudinal range for Mexico described in this manuscript is similar to the altitudes reported in some South American countries. However, it does not exceed the highest altitude known for the species, which is 3,250 meters above sea level, with a record from the highlands of La Paz, Bolivia (Bierregaard and Kirwan 2020).

The most distant record, that in the Santa Ana National Wildlife Refuge, Hidalgo, was the first for the United States (Chesser et al. 2023). The species was reported in December 2021 and remained until March 2022. It was accepted and integrated into the bird list of the American Birding Association and the American Ornithological Society as an accidental record (Pyle et al. 2022, Chesser et al. 2023). This record is 170 km from an area with breeding populations in Mexico. However, the location of said area is not specified nor how the distance

was estimated (Pyle et al. 2022). In this study I obtained a distance of 183 km between the municipality of San Carlos and Santa Ana National Wildlife Refuge.

For my records obtained in the field, it is likely that the presence of the species in Salto del Agua Llovida is due to the fact that it finds ideal habitat conditions such as temperate forest, open areas with scattered trees, perches of dead trees and proximity to bodies of water (Peterson and Chalif 1989). Additionally, it is likely that these individuals find prey items easily, as it is common to observe them in the area. In fact, existing records date back to July 2018, July 2019 (this study), April, July and November 2022 (eBird 2024, iNaturalist 2024). The last observation is from February 2024 by residents of the area (pers. comm.).

An aspect to consider as a limitation and future approaches in these works is the fact that the same individual can be recorded by different people in the same area. This may be the case of the Salto del Agua Llovida records, where possibly the reported observations are from the same individuals that remain in the area. However, this factor was not considered in this study, which may lead to an overestimation.

Records outside the potential distribution may be mainly due to a recent change of the distribution range as has been reported for other bird

species in Mexico (Fuentes-Moreno et al. 2016, Riojas-López and Mellink 2019). The loss and degradation of ecosystems due to deforestation induce changes at the regional level that can alter the distribution and diversity patterns of diurnal raptors by reducing the availability of suitable territories to survive and reproduce (Vázquez-Pérez et al. 2009). Likewise, climate change affects raptors in several ways, including changes in distribution ranges, migratory movements, population dynamics, and behavior, among others (Dunn and Moller 2019, Martínez-Ruiz et al 2023). These two factors may be the main causes that lead to the movements of the Bat Falcon outside its known distribution area.

However, it is necessary to determine the situation of the species in each region, considering sites of presence, abundance, and seasonality. Finally, potential distribution maps in some cases do not cover some areas where the species are present due to the lack of information in the area. Given the constant environmental changes and their effect on the distribution of species, it is necessary to generate new information, which gives relevance to records such as the ones I presented and analyzed. The publication of this type of records is necessary to complement the information, which gives relevance to works such as this one.

Acknowledgments

To the Department of Tourism of the State of Durango for the financing and support of the project: Bird Guides of the Ecotourism Centers and Magical Towns of Durango. To Lic. Rafael Sarmiento for his trust and support in this project. To Olivia Rojas and José de la Luz Santillán for their help in the field, to Rodrigo Ortiz for his support and hospitality at Salto del Agua Llovida, and finally to the reviewers for their valuable comments and suggestions that enriched and improved this manuscript.

References

- ArcGIS. 2021. Versión 10.8. Redlands, CA: Environmental Systems Research Institute, Inc.
- Bierregaard, R.O. and G.M. Kirwan. 2020. Bat Falcon (*Falco rufigularis*), versión 1.0. In Birds of the World (del Hoyo J., A. Elliot, J. Sargatal, D.A. Christie and E. de Juana Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.
- BirdLife International. 2024. Species factsheet: *Falco rufigularis*. Downloaded from <https://datazone.birdlife.org/species/factsheet/bat-falcon-falco-rufigularis> on 25/01/2024.
- Castaño, A.M. and K.L Bildstein. 1999. Hawks Aloft Worldwide, Estrategia Cooperativa para la Protección de las Rapaces Migratorias del Mundo. Boletín SAO. 10: 55-64.
- Chesser, R.T., S.M. Billerman, K.J. Burns, K. Cicero, J.I. Dunn, B.E. Hernández-Baños,

- R.A. Jiménez, A.W. Kratter, N.A. Mason, P.C. Rasmussen, J.V. Remsen Jr. and K. Winker. 2023. Sixty-fourth supplement to the american ornithological society's check-list of north american birds. *Ornithology*. 140: 1-11.
- Clark, W.S. and N.J. Schmitt. 2017. *Raptors of Mexico and Central America*. Princeton University Press. Princeton, New Jersey.
- Comisión Nacional para el Uso y Conocimiento de la Biodiversidad (CONABIO). 2018. Geoportal del Sistema Nacional de Información sobre Biodiversidad. Disponible en: geoportal.conabio.gob.mx. Consultado: 20 de marzo 2024.
- Crespo, S., P.F. Angulo, A. More and J. Novoa. 2013. New Records of Bat Falcons (*Falco rufigularis*) in Northwestern Peru. *Spizaetus: The Neotropical Raptor Network Newsletter*. 15: 24-31.
- Dunn, P.O. and A.P. Møller. 2019. *Effects of Climate Change on Birds*, Second ed. Oxford University Press, Oxford, UK.
- eBird. 2024. The Cornell Lab of Ornithology Cornell University. Disponible en: https://ebird.org/species/batfal1?siteLanguage=es_MX. Consultado: 19 de enero 2024.
- Ferguson-Lees, J. and D.A. Christie. 2001. *Raptors of the world*. Christopher Helm. London.
- Fuentes-Moreno, A., H. Fuentes y R. Carmona. 2016. Registros nuevos y notables de aves en el AICA Humedales de Alvarado, Veracruz. *Huitzil Revista Mexicana de Ornitología*. 1:130-138.
- Google LLC. 2022. Google Earth versión 7.3. Software. Google LLC. Disponible en: <https://maps.google.com/intl/es/earth/download/gep/agree.html>. Consultado 20 enero 2024.
- Grzimek, B. 2002. *Grzimek's Animal Life Encyclopedia*, 2nd edition. In Volumes 8–11, Birds I–IV (Michael H., J.A. Jackson, W.J. Bock and D. Olendorf Editors). Farmington Hills, MI: Gale Group.
- Hernández, L., D. Trujano, A. Mancinas, E. Rodríguez, L. Arellano, R. Ramírez, J. Nosedal, A. García, J.W. Laundré, R. Medina and J.J. Flores. 2007. El Salto del Agua Llovida, Durango, México; el primer paso para una nueva estrategia de conservación: Las reservas archipiélago. *Monografías Tercer Milenio*. 6: 287-292.
- Herzog, S.K., R.S. Terrill, A.E. Jahn, J.V. Remsen, Jr., O.Z. Maillard, V.H. García-Solíz, R. McLeod, A. McCormick and J.Q. Vidoz. 2016. *Birds of Bolivia, Field Guide*. Asociacion Armonia, Santa Cruz de la Sierra Bolivia. 248 pp.
- Howell, N.G. and S. Webb. 1995. *A guide to the birds of Mexico and Northern Central America*. Oxford University Press Inc. New York.
- iNaturalistMX. 2024. Disponible en: https://mexico.inaturalist.org/observations?place_id=11166&taxon_id=4664. Consultado: 19 de enero 2024.
- Macouzet, T. 2007. Ficha técnica de *Falco rufigularis*. En: Escalante, P. (compilador). *Fichas sobre las especies de Aves incluidas en el Proyecto*

- de Norma Oficial Mexicana PROY-NOM-ECOL-2000. Parte 2. UNAM-CONABIO. México, D.F.
- Márquez, C., M. Bechard, F. Gast and V.H. Vanegas. 2005. Aves rapaces diurnas de Colombia. Instituto de Investigación de Recursos Biológicos Alexander Von Humboldt. Bogotá, Colombia. 394 p.
- Martínez-Ruíz, M., C.R. Dykstra, T.L. Booms and M.T. Henderson. 2023. Conservation letter: Effects of global climate change on raptors. *Journal of Raptor Research*. 57(1): 92-105.
- Navarro, A.G. and A.T. Peterson. 2007. *Falco rufigularis* (halcón enano) residencia permanente. Distribución potencial, escala 1:1000000. Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México, University of Kansas, Museum of Natural History. México.
- Navarro-Sigüenza, A.G., A. Gordillo-Martínez, A.T. Peterson, C.A. Ríos-Muñoz, C.R. Gutierrez-Arellano, D. Méndez-Aranda, T. Kobelkowsky-Vidrio and L.E. Sánchez-Ramos. 2018. *Falco rufigularis* (halcón enano). Distribución potencial, escala 1:1300000. Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México, Ciudad de México, México.
- Peterson, T.R. and L.E. Chalif. 1989. Guía de campo Aves de México. México D.F.
- Pyle P., M. Gustafson, A. Jaramillo, T. Johnson, A.W. Kratter, A. Lang, M.W. Lockwood, M. Mutchler and D. Sibley. 2022. 33rd Report of the ABA Checklist Committee. 73 (2): 18-23.
- Riojas-López, M.E. and E. Mellink. 2019. Registros relevantes de aves en el sur del Altiplano Mexicano. *Huitzil Revista Mexicana de Ornitología*. 20: e-513.
- Rodríguez, B., A. Rodríguez, F. Siverio and M. Siverio. 2018. Factors affecting the spatial distribution and breeding habitat of an insular cliff-nesting raptor community. *Current Zoology*. 64(2): 173-181.
- Sociedad Antioqueña de Ornitología (SAO). 2024. Disponible en: <https://sao.org.co/halcon-murcielaguero/>. Consultado: 20 de marzo 2024.
- Terborgh, J. 1977. Bird Species Diversity on an Andean Elevational Gradient. *Ecology*. 58: 1007-1019.
- Vázquez-Pérez, J.R., P.L. Enríquez and J.L. Rangel-Salazar. 2009. Diversidad de aves rapaces diurnas en la Reserva de la Biosfera Selva El Ocote, Chiapas, México. *Revista Mexicana de Biodiversidad*. 80: 203-209.

* * *

VI NEOTROPICAL RAPTOR NETWORK IN PEREIRA, COLOMBIA, OCTOBER 2024

It is with great excitement that we announce the VI Neotropical Raptor Conference, which will take place from October 1-4, 2024. The conference venue is the Sonesta Hotel in Pereira, Colombia. We will offer 3 days of keynote talks and scientific sessions, workshops, field trips, and opportunities to socialize with other biologists, educators, veterinarians, and those passionate about birds of prey from various countries around the world.

The conference is organized by The Peregrine Fund, the Neotropical Raptor Network, and Águilas de los Andes Foundation. Other sponsors and allies are Bioparque Ukumarí, Technological University of Pereira and the Botanical Garden, CRARSI, the Colombian Association of Ornithology, Tropicós Colombia, CADIC-CONICET, FAN Colombia, Proyecto Grandes Rapaces Colombia, and Fundación Bosque Andino.

Location

Pereira is the capital of the Risaralda Department of Colombia. Located in the foothills of the Andes, it is located within one of the most important coffee-growing regions in the country.

In fact, it is part of the UNESCO World Heritage Site known as the “Coffee Cultural Landscape of Colombia.” It has a lively downtown, with opportunities to enjoy local cuisine, nightlife, shopping and culture, with considerable options along Avenida Circunvalar.

Field Trips

Pereira is surrounded by nature. Colombia has the largest number of bird species in the world, and bird watching opportunities abound. Even the grounds of Hotel Sonesta can be a good place to spend a morning bird watching. A few kilometers from the hotel is the Ukumarí Biopark, a local zoo and conservation center, which offers good bird watching throughout the grounds. The Technological University of Pereira has a beautiful Botanical Garden. Further from the city center is the Otún Quimbaya Flora and Fauna Sanctuary and the spectacular Los Nevados National Natural Park. Hiking, visits to coffee farms, and other activities are easy to organize during your stay in the country. You can learn more about the excursions we are offering before, during, and after the conference <https://peregrinefund.org/conference-field-trips>

Workshops

Before and after the conference, there will be several workshop options to help build skills and knowledge on various topics related to birds of prey and their conservation. The workshops include: Territoriality in raptors: an approach from point pattern analysis; Management, Medicine and Rehabilitation of Birds of Prey; An approach to Collective Painting, Illustration and Poetry; Basic R for Data Analysis and Visualization; Introduction to the Identification and Counting Methods of Migratory Raptors; Basic Course on

Ascent to the Canopy for the Study of Raptors in the Neotropics; How NOT to Install Camera Traps in Nesting Areas; and Searching for, Processing and Analyzing of Pellets. Workshop space is limited. <https://peregrinefund.org/conference-workshops>

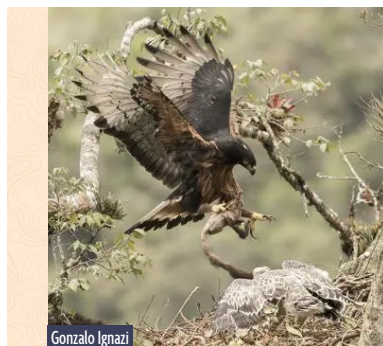
We are [accepting abstracts](#) until **1 July** and [registration](#) is now open. We hope to see you there!





VI Conferencia de las AVES RAPACES Neotropicales

1 al 4 de Octubre de 2024

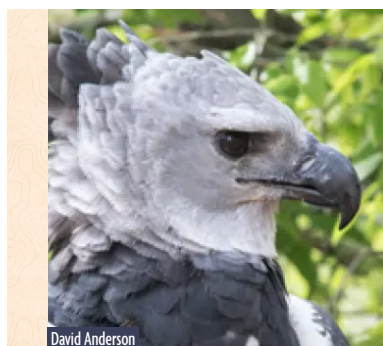
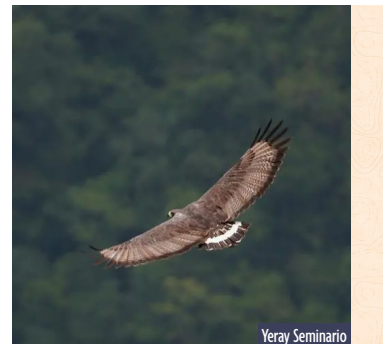


THE CONFERENCE

It is with great pleasure that we announce the VI Neotropical Raptors Conference in Pereira, Colombia from 1–4 October 2024.

LOCATION

Pereira, Colombia, in the Risaralda District, is known for its delicious coffee, beautiful landscapes, and high diversity of birds and other wildlife.

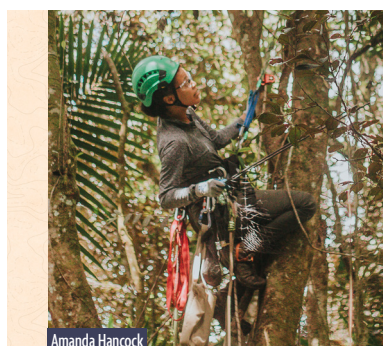
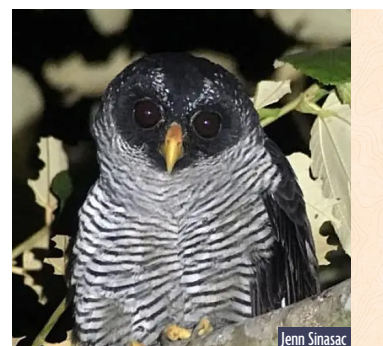


CALL FOR ABSTRACTS

Submit short abstracts by 1 May through the conference website (scan QR above). Talks may be presented in English or Spanish.

MOVIE NIGHT & SILENT AUCTION

Enjoy a night of short films focused on raptor conservation in the Neotropics and bid on raptor-themed items donated by conference attendees.

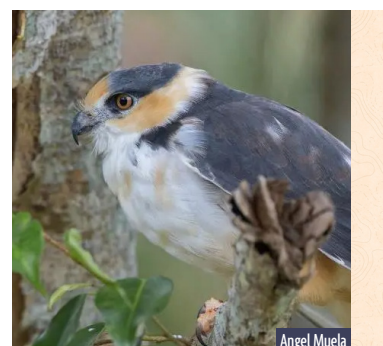


SYMPOSIA & WORKSHOPS

We will be hosting four symposia related to bird of prey conservation and offering raptor skills courses including tree climbing, first-aid for raptors, and more.

FIELD TRIPS

Discover the natural beauty of Pereira and the Risaralda District through one-day or multi-day birding and cultural field trips organized by local tour companies.



If you have any questions, please contact Marta Curti directly at mcurti@peregrinefund.org.

Visit us at
[peregrinefund.org/
conference-home-page](http://peregrinefund.org/conference-home-page)
to learn more, register, submit
an abstract, and much more!



OF INTEREST...

Grants

S.T.O.R.K. GRANTS

nabci-us.org

U.S.- NABCI seeks to promote full annual cycle conservation in ways that are guided by the best available science and that are collaborative and inclusive. A critical component of achieving this objective is identifying and reducing systemic barriers to conservation efforts in locations used by North American breeding birds during the migratory and non-breeding periods.

The S.T.O.R.K. grant will provide monetary support to researchers from countries outside of the U.S. that wish to publish scientific findings on migratory birds in English-language peer-

reviewed journals but are in need of professional translation assistance.

Through this grant, our goals are to assist emerging scientists in overcoming publication hurdles, amplify the voices of researchers and conservationists from Latin America and the Caribbean, underscore the importance of incorporating scientific insights from all stages of birds' annual cycles in conservation planning, and raise awareness about the dominance of English-language publications in peer-reviewed journals.

Conferences

BIRDS CARIBBEAN CONFERENCE

<https://sites.google.com/view/birdscaribbeanconference2024>

The conference will take place in Santo Domingo, Dominican Republic from July 18 to 22, 2024. BirdsCaribbean conferences bring together wildlife professionals, ornithologists, educators, decision makers, the ecotourism industry, community leaders, students, volunteers and many others from the Caribbean and internationally to network, share information and learn about the latest research and innovative conservation initiatives for Caribbean birds and their habitats.



Neotropical Raptor Network
www.neotropicalraptors.org

Issue 37, June 2024

