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A noteworthy new record of Gray-bellied Hawk, *Accipiter poliogaster* (Temmink, 1824) (Accipitiformes, Accipitridae), in the lowlands of northern Costa Rica

Elián Villalobos Alvarado[1], José Manuel Mora[2,3*]

1 Carrera de Gestión Ecoturística, Sede Central Universidad Técnica Nacional. Alajuela, Costa Rica • elianbirder13@gmail.com https://orcid.org/0000-0002-5417-9275

2 Carrera de Gestión Ecoturística, Sede Central Universidad Técnica Nacional. Alajuela, Costa Rica • jmorab@utn.ac.cr https://orcid.org/0000-0002-1200-1495

3 Department of Biology and Museum of Vertebrate Biology, Portland State University, Portland, Oregon 97207, USA • jomora@pdx.edu

* Corresponding author

Abstract. Gray-bellied Hawk, *Accipiter poliogaster* (Temmink, 1824), is a rare forest dwelling raptor in South America. This hawk migrates from Paraguay and northern Argentina (Misiones) in the south to the equator for the winter. In Costa Rica this species has occasionally been recorded from a few localities. We present here a new record from a disturbed area in the northern lowlands of the country. *Accipiter poliogaster* may be a rare vagrant or an occasional visitor in Costa Rica, or it may be expanding its range northward into the country due to increases in disturbed land caused by humans.

Keywords. Distribution, migrants, Nicaragua, range expansion, raptor, South America

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Introduction

There are 39 species of hawks and eagles (Accipitridae) reported from Costa Rica. These species include 29 residents, four migrants (two of which nest in the country and then leave), two passage migrants, and two with occasional or unknown status (Garrigues and Dean 2014). Gray-bellied hawk, *Accipiter poliogaster* (Temmink, 1824), has been reported a few times in Costa Rica and is considered either occasional in the country (Bird et al. 2012; Araya-H. et al. 2015; GBIF 2022) or a rare vagrant or visitor from April to August (Vallely and Dyer 2018). Recently, BirdLife International (2022) has classified it as resident in Costa Rica.

Accipiter poliogaster inhabits tropical lowland evergreen forests from Argentina to northern Costa Rica (Thiollay 1994; Ferguson-Lees and Christie 2001) at elevations of 0–500 m above sea level (Márquez et al. 2005), although, there are records at higher elevations, including one from 1,800 m a.s.l. in Brazil and from 1,950 m a.s.l. in Ecuador (Howell 2002; de Melo et al. 2019). Despite having a wide geographical range, the distribution of *A. poliogaster* is patchy and occurring only locally, and it is generally rare (Collar 1986). Although the large-scale movements of this species are not well known, it is thought to migrate from Paraguay and Misiones province in northern Argentina in the south to the equator for the winter (March to June) (Márquez et al. 2005; Bildstein 2006). *Accipiter poliogaster* reaches far north, to east of the Andes in Colombia and north-western Ecuador, southern Venezuela, and Guyana (Brown and Amadon 1989).

Accipiter poliogaster prefers pristine rainforest habitats, riparian forests, and other dense woodlands (BirdLife International 2022). However, it does rarely occur in degraded and fragmented forests (Jullien and Thiollay 1996), as well as secondary forests (Ferguson-Lees and Christie 2001; Buitrón-Jurado 2011). Although *A. poliogaster* is considered a forest specialist that feeds on

birds, Boesing et al. (2012) reported a young armadillo brought to a nest by a parent male. One interesting aspect of the biology of *A. poliogaster* is that immatures mimic Ornate hawk-eagles, *Spizaetus ornatus* (Daudin, 1800), as a defensive strategy (Prum 2014; Negro and Galván 2018).

Previous records of *A. poliogaster* in Costa Rica in the literature include two juveniles and one adult; all three records are from the northern lowlands of the country (Obando et al. 2009; Araya-H. et al. 2015). The Global Biodiversity Information Facility contains other reports from the same localities. Here, we report a new sighting, also from northern Costa Rica, of this species in a degraded area composed of a pastureland with live fences (live standing trees) and scattered trees. This new report is important because it contributes information on the distribution of *A. poliogaster* in Costa Rica and may help to determine what factors are important for its distribution. *Accipiter poliogaster* is classified as Near Threatened in Costa Rica (BirdLife International 2022). Additionally, despite its ample distribution, records are scant and localized, and few specimens are preserved in museums (Lanzer et al. 2009; de Melo et al. 2019).

Methods

We conduct birding tours in the Sarapiquí area of Heredia province, Costa Rica, where we do guided tours for general nature observation. Sarapiquí is well-known for birding and other ecotourism activities (Jones and Spadafora 2017). There are several biological stations and reserves in the area that attract a large number of researchers and visitors that have contributed greatly to increasing knowledge of the region's biodiversity (Butterfield 1994). During a tour, we found an individual of *A. poliogaster* at a forest edge.

We photographed the hawk from several meters away and observed it for several minutes before it flew away. We identified the bird in the field, later confirming our identification by comparing our photos with bird identification guides and other literature (Blake 1977; Thiollay 1994; del Hoyo et al. 1994; Ferguson-Lees and Christie 2001; Ridgely and Greenfield 2001; Garrigues and Dean 2014; Vallely and Dyer 2018; BirdLife International 2022).

We obtained occurrence data for *A. poliogaster* from the literature (Thiollay 1994; Bildstein et al. 2000; Ferguson-Lees and Christie 2001; Márquez et al. 2005; BirdLife International 2022), as well as additional Costa Rican records of this species from the Global Biodiversity Information Facility (GBIF 2022).

Results

***Accipiter poliogaster* (Temmink, 1824)**

Figure 1

New record. COSTA RICA – Heredia • Sarapiquí, Puerto Viejo, near Chilamate village; 10°27′04″N, 084°03′43″W; 70 m elev.; 02.IX.2022; Elián Villalobos Alvarado obs.; 1 juvenile, sex undetermined; individual photographed but not collected.

The photographed individual of *Accipiter poliogaster* (Fig. 1) was perching high in a large tree on pastureland used for cattle ranching. The pasture area had scattered trees and live fences (Fig. 2), but there was nearby continuous dense forest (Fig. 2). The bird stayed quiet in the tree for several minutes, then flew away, to the north. Chilamate is only about 10 km from La Selva Biological Station where *A. poliogaster* was reported in 2009 (Fig. 3).

Other Costa Rican occurrences. Previous records of this species in Costa Rica have been reported in the literature; these are from the northern part of the country: two from La Selva Biological Station, Puerto Viejo de Sarapiquí, Heredia (June 2008 and March 2009), and one from Boca Tapada, San Carlos, Alajuela on April 2014 (Obando et al. 2009; Sandoval and Sánchez 2014; Araya-H. et al. 2015). Additionally, there are 11 records of this species from Costa Rica in the Global Biodiversity Information Facility database; all of these records are also from northern Costa Rica (GBIF 2022). Nine

Figure 1. *Accipiter poliogaster* individual photographed at Chilamate, Puerto Viejo de Sarapiquí, Costa Rica. Photograph by Elián Villalobos Alvarado.

Figure 2. Live fence where an *Accipiter poliogaster* was photographed at Chilamate, Puerto Viejo de Sarapiquí, Costa Rica. Photograph by Elián Villalobos Alvarado.

records probably are the same individual, observed between August 2018 and March 2020 at Laguna Lagarto Lodge, San Carlos, Alajuela. One of the 11 GBIF records is from La Selva in 2009 (included by Araya-H. et al. 2015). One of the "Costa Rican" GBIF records is an iNaturalist (2022) observation from 7 February 2022; however, it is apparently from Nicaragua (10.8°N, 084.1°W), which, if correct, would be the first record for *A. poliogaster* from Nicaragua and the northernmost known occurrence of this species (Fig. 3).

Identification. *Accipiter poliogaster* is a very confusing raptor to identify (Garrigues and Dean 2014). The upper parts are mostly plain gray with a black crown; the throat and underside of the body is variable in coloration, from light gray to white (Blake 1977; Buitrón-Jurado 2011; Vallely and Dyer 2018). The cere, eyes, and legs are yellow, and the sides of the head in adults are black or gray and may have a black malar (Vallely and Dyer 2018). The nape has some white feathers, and the dark tail has three wide, light grey, horizontal bands and a clearly narrow, white tip (Howell 2002; Buitrón-Jurado 2011; Melnyk et al. 2013). This species is often confused with the similar appearing Slaty-backed Forest-Falcon, *Micrastur mirandollei* (Schlegel, 1862), and Bicolored Hawk, *Accipiter bicolor* (Vieillot, 1817) (Garrigues and Dean 2014). However, the juvenile plumage of *A. poliogaster* clearly resembles that of *Spizaetus ornatus*, so it should be unmistakable (Garrigues and Dean 2014).

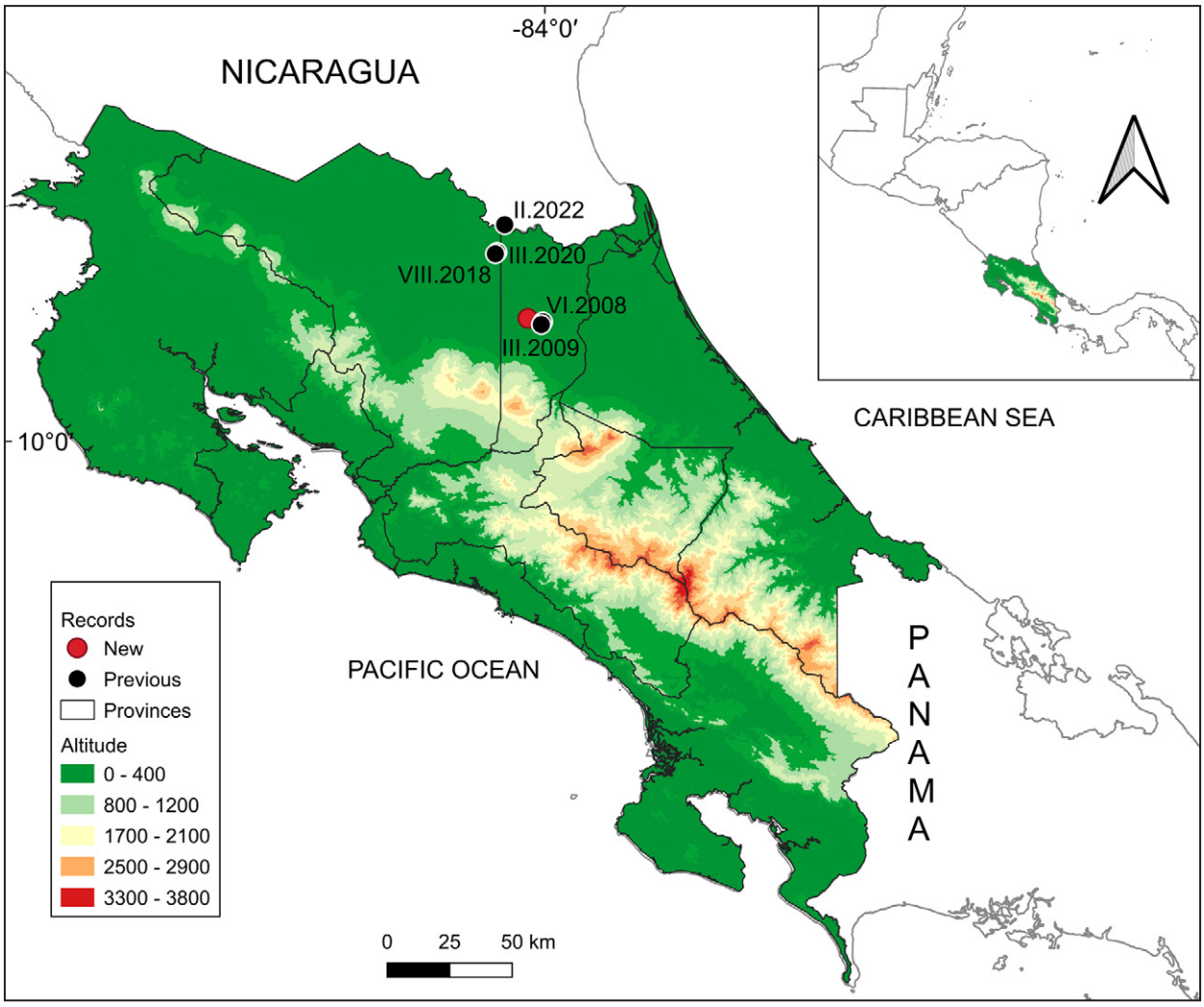

Figure 3. Localities and dates of previous (black dots), and new record (red dot) of Gray-bellied Hawk (*Accipiter poliogaster*) in northern Costa Rica. The new record, from Chilamate, Puerto Viejo de Sarapiquí, was made on 02.IX.2022.

Discussion

We report the presence of *Accipiter poliogaster* from a degraded area in the Tropical Wet Forest life zone of northern Costa Rica (Fig. 3). The Sarapiquí region has undergone a dramatic elimination of large tracts of tropical forest with an increase in cattle ranching since the 1950s (Butterfield 1994).

The main threat for *A. poliogaster* seems to be habitat loss by deforestation, mainly in the Amazon Basin (Bird et al. 2012; Sarasola et al. 2018). This hawk species is also susceptible to population fragmentation due to its patchy distribution (Collar 1986); however, in a population analysis of several raptor species, Sarasola et al. (2018) concluded that *A. poliogaster* is experiencing a population recovery. Our new report of this species came from an area with human-caused disturbances: most of the land is used for cattle ranching and agriculture (Fig. 2), and monocultures such as banana and pineapple are common in the Sarapiquí area (Montagnini 1994). As *A. poliogaster* has been observed foraging and nesting in degraded habitats, it may be tolerant of some habitat disturbances (Boesing et al. 2012; BirdLife International 2022).

Accipiter poliogaster was assessed as Least Concern by the International Union for the Conservation of Nature Red List until 2012, but it was later up-listed to Near Threatened (BirdLife International 2016, 2022). This change was based on projected future population declines due to accelerated deforestation in the Amazon Basin and a small estimated population (Walker et al. 2006; Bird et al. 2012).

The individual of *A. poliogaster* that we observed is the third juvenile reported from Costa Rica in the literature. The previous two sightings were thought to have been the same individual (Araya-H. et al. 2015), and it was suggested that the first-reported adult may have been the same individual, now mature (Araya-H. et al. 2015). It is certain that the juvenile individual we observed is a different one, and there are also other records from GBIF (see above) that represent more individuals.

Although sightings of *A. poliogaster* are sporadic, it is still impossible to know if occurrences of this species in Costa Rica are accidental (Chesser et al. 2011) or if colonization to the north is in progress. It has been suggested that *A. poliogaster* is experiencing a range expansion into Costa Rica due to the increase in human-disturbed land, which this hawk apparently tolerates as a nesting habitat (Boesing et al. 2012; Araya-H. et al. 2015). This phenomenon has been observed for several other bird species in Costa Rica and elsewhere (Mora and López 2014). If *A. poliogaster* is expanding its geographic range, this would be a positive sign for its survival. However, the ecological consequences of this colonization are unknown, and the study of nesting activity of *A. poliogaster* in Costa Rica would be highly informative.

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Author Contributions

Conceptualization: JMM. Formal analysis: JMM. Funding acquisition: EV. Investigation: EV.

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