

A review of the distribution of the Crested Eagle, *Morphnus guianensis* (Daudin, 1800) (Accipitridae: Harpiinae), including range extensions

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ABSTRACT: Here we review the distribution of the Crested Eagle (*Morphnus guianensis*) in the Americas, and based on the Brazilian Harpy Eagle Conservation Program (PCGR) database, literature, online databases, zoos, wild and museum records, we provide an updated distribution map with 37 points outside the IUCN map; 16 were recorded close to the border of the map (up to 40 km), and do not expand or contribute to the distribution map. Far from the border (>40 km) we found 21 records, contributing to an expansion of the known range and habitat. At the northernmost extreme of distribution, the range was extended to southern Mexico; in Nicaragua, the range extension was farther south in the north, and two records extend the range to the southern border with Costa Rica. In Colombia, an old specimen is located between Darien Peninsula and the Perija Mountains. In Brazil a record from the ecotone between Cerrado and Gallery Forest, and another in an upland remnant of Atlantic Rainforest, expands the range towards central and southeastern Brazil, and to the Northeast, old records could expand the Atlantic Rainforest distribution towards the interior.

KEY-WORDS: Conservation, Falconiformes, Neotropics, Raptor.

Included in the order Accipitriformes, the Crested Eagle, *Morphnus guianensis*, and Harpy Eagle, *Harpia harpyja*, are the Neotropical representatives of the subfamily Harpiinae (CBRO 2014). The members of Harpiinae can be distinguished from other Accipitridae by large sizes and weight, length and wingspan, being traditional inhabitants of humid tropical forests (Ferguson-Lees & Christie 2001), preying on mid-sized mammals such as sloths, monkeys, and rodents (Ferguson-Lees & Christie 2001; Aguiar-Silva *et al.* 2014).

The species occurs in low density, and is deemed rare to very rare in all areas of distribution, mainly inhabiting Neotropical dense humid forest, mountain slopes, coastal forest, from sea level to 2200 m; it is considered resident (Brown & Amadon 1968; Hilty & Brown 1986; Bierregaard 1994; Howell & Webb 1995; Ridgely & Greenfield 2001; Ferguson-Lees & Christie 2001; Hilty 2003; Hennessey *et al.* 2003; Jones & Komar 2007). It can also occur in forest patches and has been recorded nesting in a Brazilian forest fragment, located in a mosaic

between soybean fields and forest fragments (Lees *et al.* 2013), and also has been found in forest mosaics within the Gran Sabana, Venezuela (Crease & Tepedino, 2013).

In Brazil, the Crested Eagle is known as “Uiraçu-falso” or “Gavião-real-falso” [=False Harpy Eagle] (CBRO 2014). According to the literature, adults reach up to 89 cm in total length, wingspan up to 154 cm and weight up to 3 kg; females are larger and more robust (Bierregaard 1994; Ferguson-Lees & Christie 2001). The head is grayish with a crest tipped with a single larger medial black feather. In general the color pattern resembles that of Harpy Eagle, however the latter always has a black chest band (Sick 1997; Ferguson-Lees & Christie 2001). Adults most commonly are pale-morph, but may occur in two melanistic forms, dark-morph and extreme-dark-morph. During its 4-year sequence to attain adult plumage, birds become darker over time (Bierregaard 1994; Ferguson-Lees & Christie 2001).

Mauduyt (1782), described the *Aigle (petit) de La Guiane* in a systematic and comparative way, with

specimens coming from Cayenne [=French Guiana]. Based on this work, in 1800 Daudin described *Falco guianensis* using Linnean nomenclature. Later, *Falco* was made a synonym of *Morphnus* by Dumont (1816), giving rise to the monotypic species *Morphnus guianensis*. In 1879, Gurney described *Morphnus taeniatus* as a full species, later synonymized because it was just a dark-morph (Lehmann 1943).

The Crested Eagle has a wide distribution over Central and South America (Ferguson-Lees & Christie 2001), however records are generally casual or by chance, being considered rarer than the Harpy Eagle in some regions where they coexist (Jones & Komar 2006).

More than 250 years after its description, few surveys include the species in their lists, and studies of its biology and ecology are rare, therefore understanding its distribution is the goal of this review. The Crested Eagle is a top predator, occurring in low densities, and is considered a Vulnerable (IBAMA 2014) and Near-threatened (IUCN 2014) species, due to habitat loss and hunting. The knowledge of its current distribution and ecological requirements could contribute as a basis for further conservation policies.

Currently, the most widely used distribution maps as a basis for conservation plans and determining the threat status of the vast majority of organisms are provided by the International Union for Conservation of Nature (IUCN 2014). However, recent records, very old ones, and those from gray literature or from birdwatchers, photographers or videographers are lacking consideration. Our goal is to review the distribution of the Crested Eagle, including new records, particularly for Brazil, which holds the largest continuous forests in the continent, and produce an updated map of its occurrence.

MATERIAL AND METHODS

The review follows the format of the database of the Global Raptor Information Network - GRIN (2013) for all countries. It is augmented with more details for the states of Brazil, old published records, information from the Brazilian Harpy Eagle Conservation Program (PCGR) database and online databases such as ORNIS, IBC and AVECOL, gray literature (such as Instituto Brasileiro de Meio Ambiente de Recursos Naturais Renováveis (IBAMA) [=Brazilian Environmental Agency] reports), birdwatcher reports, lodge lists, unpublished reports, photographs, and recently published studies. Those sources where the indication of the distribution of the species was very broad and poorly defined (for example, no specific localities mentioned) were not used in our final map.

The final map was created using the ArcGIS software at the “Laboratório de Agrimensura da Universidade

Estadual do Amazonas”. Records were subdivided into New (after 2000), Old (prior to 2000), Nests, and Rescued individuals by IBAMA overlaid with distribution limits provided in the IUCN map (IUCN 2014). For published records, whenever possible, we used the exact date, and when the article did not provide this information, we used the publication date. Not all records had accurate locations. When this information was available, the exact locality was included on the map, following the exact geographical coordinates. For those records with no exact geographic coordinates, we used coordinates associated with the geographical center of the municipality where they were obtained. Seven museum specimens without collecting dates were assumed as Old records on the map (prior to 2000). All records are presented in the Appendices, but some were not included on the map because they overlapped, or had little accuracy.

Collections and Museums

Since 2005, the “Programa de Conservação do Gavião-real” PCGR-INPA [=Brazilian Harpy Eagle Conservation Program; <http://gaviaoreal.inpa.gov.br>] visited collections researching specimens of Harpy Eagle, Crested Eagle, and Hawk-Eagles, to build a distributional database. Eight Brazilian collections housed specimens of Crested Eagle: Museu Paraense Emílio Goeldi (Belém, Pará – MPEG), Instituto Nacional de Pesquisas da Amazônia – Coleção Ornitológica (Manaus, Amazonas – INPA), Museu de Zoologia da Universidade de São Paulo (São Paulo, São Paulo – MZUSP), Museu de História Natural de Taubaté (Taubaté, São Paulo – MHNT), Universidade Federal de Santa Catarina – Coleção Ornitológica (Florianópolis, Santa Catarina – UFSC), Museu Frei Miguel (Luzerna, Santa Catarina), Museu de Biologia Prof. Mello Leitão (Santa Teresa, Espírito Santo – MBML), as well as small private collections as tourist exhibits, such as Museu do Índio (Florianópolis, Santa Catarina). Data from two collections, Museu Sete Quedas (Pato Bragado, Paraná) and Museu da Fauna (Rio de Janeiro, Rio de Janeiro, closed in 1983 and its collection transferred to Museu Nacional in 1993), were taken only from literature describing their holdings. Twelve collections outside Brazil had Crested Eagle specimens, and data were accessed directly from the institution’s website or from websites that replicate information from different collections, such as ORNIS, where we accessed the collections of the Academy of Natural Sciences of Philadelphia (Philadelphia, Pennsylvania – ANSP); the United States National Museum (Washington, D. C. – USNM); Field Museum of Natural History (University of Chicago, Chicago, Illinois – FMNH); Louisiana State University Museum of Zoology (Baton Rouge, Louisiana – LSUZ); Museum of Comparative Zoology (Harvard University, Cambridge,

Massachusetts – MCZ); American Museum of Natural History (New York, New York – AMNH); Royal Ontario Museum (Toronto, Canada – ROM); Carnegie Museum of Natural History (Pittsburgh, Pennsylvania – CM); Los Angeles County Museum of Natural History (Los Angeles, California – LACM); Western Foundation of Vertebrate Zoology (Camarillo, California – WFVZ), and the Oklahoma Natural History Museum (Oklahoma City, Oklahoma – OMNH). Specimens with imprecise information about the collection site were not included on the map (Appendices 1 and 2).

Rescued and Captive Birds in Brazil

For the location of individuals rescued by wildlife authorities in Brazil (IBAMA), one point for the location of each bird's origin was plotted on the map, with the date of rescue included only in the text. For individuals at conservation centers and zoos, we inserted a point on the map only if they had information on the origin/capture. Current or past individuals of Crested Eagle were at: Zoológico de São Paulo – São Paulo; Zoológico do Centro de Instrução e Guerra na Selva – CIGS, Manaus, Amazonas; Zooparque de Itatiba – Itatiba, São Paulo; Zoológico Municipal Dois Irmãos – Recife, Pernambuco; and Criadouro Conservacionista – CRAX in Belo Horizonte, Minas Gerais (Appendix 1).

Online Databases

Open access online databases were also consulted. Photo and sound files and videos were obtained from the following websites providing both records and accession numbers: www.wikiaves.com.br (WA), www.xeno-canto.org (XC), and Macaulay Library (MAC) Cornell Lab. of Ornithology, Ithaca, New York (<http://macaulaylibrary.org>); or less scientific sites, such as the Internet Bird Collection (IBC), and stock photos at the Visual Resources for Ornithology (VIREO) at the Academy of Natural Sciences, Philadelphia (<http://vireo.acnatsci.org>). Some records came from private photo collections (Flickr); the authors were asked for permission to use the records and in some cases provided additional data. Despite the chance of mistaken identifications between Crested and Harpy eagles, some unpublished sight records and sound recordings of Brazilian professional and amateur ornithologists alike were included in the distribution map (Appendices 1 and 2).

RESULTS

A total of 269 Crested Eagle records were found from Mexico to Argentina. Listed by locality, 129 records were

obtained for Brazil and 140 records for Mexico, Central America and other South American countries. From the total, 45 records did not meet criteria and were rejected from our map when they did not have known origin (zoo or museum specimens), were repetitive (different years at the same point), or the literature listed only “general occurrence” (Appendices 1 and 2).

Listed by source, 156 records are from published literature in articles and books, 45 are records from museums and collections (ORNIS database), and 17 are records from our PCGR Database. The remaining 51 records were obtained from online photo and sound websites and personal communications (Appendices 1 and 2).

Listed by date, the records spanned 1898–2014. One hundred and thirty records are Old (before 2000), 113 are New (after 2000), and 26 records have no precise date (Appendices 1 and 2). A total of 37 records were placed outside the IUCN map, and are highlighted in bold in the appendices (Appendices 1 and 2).

Review of the distribution of the Crested Eagle outside Brazil

Of the 140 records obtained for Crested Eagle in Mexico, Central and South America, excluding Brazil, 96 were sourced from published literature in books or articles, 27 came from records in museums and collections, and 17 were obtained from online databases, recordings of vocalizations and photos from personal archives. From those records, 30 are located outside the distribution map provided by IUCN (Figure 1), enlarging the area of occurrence to southern Mexico, to the north of Nicaragua and to its southern border, and in Colombia, to include the region between Darien Peninsula and the Perija Mountains, and all are highlighted in bold in Appendix 2.

North America

Mexico – The first visual record in the country (a soaring adult), occurred in 1992 in Campeche (J. Sutter and J. M. Diaz cited in Whitacre *et al.* 2012). However the first documented record was a photo from 2004, at the Biosphere Reserve of Montes Azules, in Chiapas (Grosselet & Gutierrez-Carbonel, 2007). Whitacre *et al.* (2012) mentioned the probable occurrence in Chiapas and Quintana Roo.

Central America

Crested Eagle can be considered rarer than the Harpy Eagle in regions where they coexist, according to Jones & Komar (2006).

Belize – The first record occurred in 1995, at Orange Walk (Hall 1995), and is rarely seen in Toledo and Orange Walk, Cayo (Jones *et al.* 2000). A probable record was

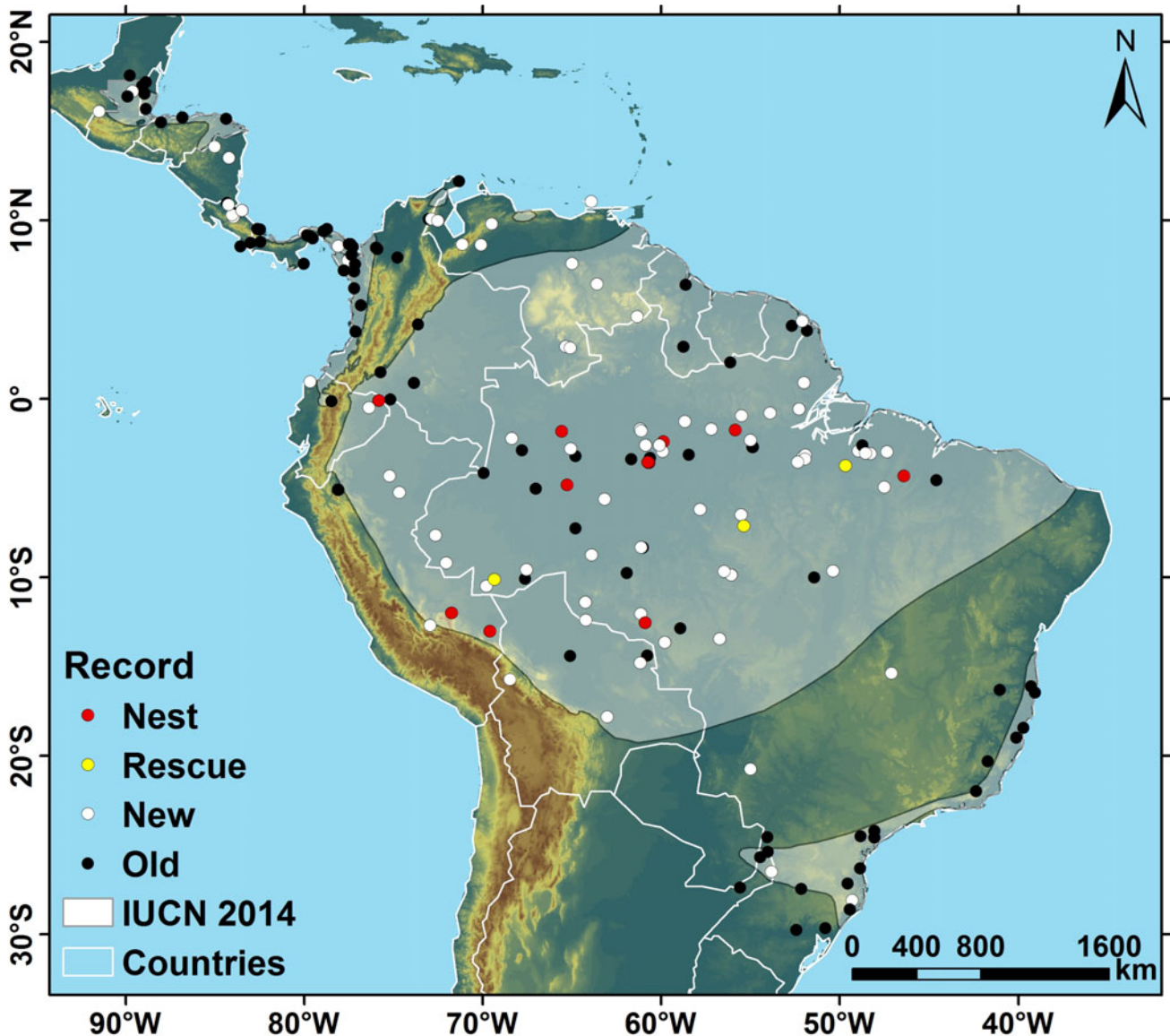


FIGURE 1. Localities where the Crested Eagle (*Morphnus guianensis*) has been recorded until 2014 (see Appendices 1 and 2). White circles represent recent records, after the year 2000; black circles represent records prior to 2000; red circles represent nests; yellow circles represent individuals rescued by IBAMA. The white water mark denotes the range contained in the IUCN (2014) map.

made in December 2006 in the southeast at Hickatee Lodge, Punta Gorda, Toledo (Jones & Komar 2007).

Guatemala – The first record occurred in 1978, reported by Ellis & Whaley (1981), in Flores (Petén). Between 1994 and 1995 an active nest was found in Tikal National Park, also Petén (Whitacre *et al.* 2012) and observations of a young bird were made in the same place, with a juvenile reported (Grijalva & Eisermann 2006). Eisermann & Avendaño (2007) considered the species resident and restricted to low-lying areas in the Atlantic region. The AMNH has a specimen collected in 1978 in Flores, Petén, and ROM has a specimen collected in 1966, in the same location.

Honduras – Bangs (1903) reported collection of a young male at La Ceiba, and Monroe (1968) of another individual in San Pedro Sula. A juvenile was photographed by Russell Thorstrom in flooded forest

in Quebrada Kahkatingni, Patuca River, in June 1999 (GRIN 2013). Bonta & Anderson (2002) consider it a rare and resident species. The MCZ listed a skin from La Ceiba collected in 1902.

Nicaragua – An individual was seen in March 2001, near the community of Hormigero, Cerro Sasiaya, in the Bosawas Biosphere Reserve (GRIN 2013). Two other individuals were seen in May 1994 and May 1999 (Múnera-Roldán *et al.*, 2007) in the south, at Bartola Reserve; another individual was seen in 2001 in the “North Atlantic region” of the country, in the Alamikangban community, Prinzapolka, by Kjeldsen (2005).

Costa Rica – Birds were seen in the regions of Sarapiquí and Osa Peninsula (Stiles & Skutch 1989). There is a record of Carriker (1910) in Cuabre, near the Sacsola River (probably Sixaola). Slud (1964) recorded an individual at Cañas Gordas, near Panama. There were

also records at Finca La Selva and Rara Avis Jungle Lodge, around Braulio Carrillo National Park (Jones 2004). An adult dark-morph was photographed in 29 April 2011, in Crucitas, Curtis de San Carlos, Alajuela (photo by R. Vargas; P. Camacho, pers. comm.) There is a photograph of a subadult pale-morph in 2005 from Tortuguero near the Nicaraguan border (Jones & Komar 2006), including a pale and a dark-morph pair photographed in 2005 (G. Ocklind, pers. file); besides there are two recent records, one from March 2013 (in the park, photo and record by R. Osborne and E. Miranda) and January 2014 (Caño Harold, photo by C. C. Obando), both from Tortuguero National Park (P. Camacho pers. comm., Fundación Rapaces de Costa Rica Database). The CM has a specimen collected in Cuabre, Limón, in 1904.

Panama – It is considered very rare, occurring in continuous forest and on the Caribbean slope, from southeast to east (Wetmore 1965; Ridgely & Gwynne 1989). There are occasional records from the southwestern Azuero Peninsula (Cerro Hoya region), in the provinces of Panama (eastern region) and Darién; those from Chiriquí and Coiba Island are unsubstantiated; there is a photographic record near Achiotte Road in January 1975 (reported by W. Cornwell) (Ridgely & Gwynne 1989). Kiff *et al.* (1989) notes an egg obtained in the wild from a nest located on the Chiquita River, central Panama, and passed to the CEPEPE [=Center for Propagation of Endangered Panamanian Species]. Vargas *et al.* (2009) reported an adult Crested Eagle feeding a nestling Harpy Eagle in Quintin Darién. A young Crested Eagle was reported from San Lorenzo National Park, Colón, in March 2007 by Jones & Komar (2007). Two records were made in Darién National Park: an adult dark-morph was filmed at the Cana Camp in May 2010 (E. Groenewoud, IBC), and a female was sound-recorded by A. Spencer near her nest in March 2013, in Rancho Frio. The MAC has a sound recording made in 1981, of a dark-morph female perched in a tree, next to Pipeline Rd., northwest of Gamboa, in the Canal Zone (van den Berg 1981). The MCZ holds four old specimens from Panama: Changuinola (1928), Perme, in Darién (1929), Banana River (1928) and Puerto Obaldia (1930). The FMNH has a pair collected in San Blas, Puerto Obaldia, in 1935. The AMNH has one specimen from Barro Colorado Island from 1936, and two from Tapalisa, eastern Panama, from 1915.

South America

Colombia – Considered rare by Hilty & Brown (1986), these authors cite localities of Chocó, Baudó mountains, Achicayá and Sinu valleys, Córdoba and Perijá mountains, Guajira (Carraipia), the eastern region of the Andes, and west of Meta (Villavivencio) and Caquetá. Márquez *et al.* (2005) provides records in museums, at

least four specimens collected in Leticia, Caquetá and Chocó (Salaqui River and Juradó River). ANSP has a specimen listed from Morelia, Caquetá, undated. USNM maintains three complete specimens preserved in alcohol: one from Truandó, one from the Sinu River, in Rescues, Córdoba, 1949, and one from Uraba Gulf in Acandi, Chocó, 1949. FMNH maintains two specimens collected in Chocó in 1940, from Jampavado River and from Jurado River, plus one from Cuturu, Antioquia, in 1947.

Ecuador – Very rare, but has been recorded in the Pichincha region and at the base of the Andes (Ridgely & Greenfield 2001). Muñiz-López *et al.* (2007) cite its occurrence in Esmeraldas Province. In 2007, a pale-morph individual was seen preying on a snake (*Spilotes pullatus*) in Cuyabeno, Sucumbios Province (L. Vaincembacher, IBC, 2007). In the Wildlife Center of Napo, the species has been seen by birdwatchers and is listed for the region (<http://www.napowildlifecenter.com>), plus a photographic record of an individual dark-morph in 2008 (T. Cloudman <http://www.hargrove.org/2008/images/2008crestedEagle-edited-jpg>). In 2014 a nest was found in the Cuyabeno Reserve (R. Muniz-Lopes pers. comm.). In the Quito Zoo there is a female dark-morph of unknown origin (Montalvo & Montalvo 2012).

Bolivia – Pearman (1994 *In* GRIN 2013) records the species for the first time in Beni. Then it was seen in Noel Kempff National Park (Bates *et al.* 1998) and subsequently in La Paz and Santa Cruz de la Sierra (Hennessey *et al.* 2003). In 2005 it was seen in Caparú Biological Station (Vidoz *et al.* 2010).

Peru – Considered rare, it occurs in the eastern region of the Andes (Clements & Shany 2001). Kiff *et al.* (1989) cite the capture of a female from a nest in Amazonas Department in 1978 (this individual became part of the breeding stock at the Oklahoma City Zoo). It is listed from the Tambopata-Candamo Reserve (Parker *et al.* 1994), where they have recorded breeding activity since 2002 (Raine 2007). In 1977 and 2006, two different nests with nestlings were photographed in Madre de Dios, near Manu Lodge (R. Fabbri, pers. comm.). In 2001 it was seen preying on small primates, at the Quebrada Blanco Biological Station (Vasquez & Heymann 2001), and in June 2012, a young on the ground was seen and photographed (Flickr) in National Park Pacaya-Samiria, Loreto (A. Morales, personal file). The species is listed by Foss & Huanaquiri on a birdlist at a forest reserve in Loreto (Tahuayo River – <http://thinkjungle.com/amazon-jungle-tours/tahuayo-lodge>). The Centro de Reproduccion Huayco, in Lima, owned by Jose Antonio Otero, housed six individuals with no record of origin. LSUMZ maintains two specimens collected from Amazonas Department, two specimens from Loreto Department, and a feather from the same location, all without exact dates.

Venezuela – Rarely sighted, occurs widely over lowland forests and mountains, with records from Northern Orinoco, Caura River, Maracaibo Basin, Perijá Mts., Zulia, Mérida, Lara, Amazonas, Bolívar, and Margarita Island (Hilty 2003). In 2006 it was recorded in Obispos, Barinas (Vargas *et al.* 2009), and in 2011, a nest was found and monitored in the Gran Sabana, Bolívar, with documenting photos by Crease & Tepedino (2013).

Guyana – Considered resident and scarce, occupying lowland forest environments (Braun *et al.* 2000). Pickles *et al.* (2011) recorded the species in the Chief Rewa Reserve, in Rupununi, in the south. Two specimens housed at ROM are from this same region, upper Takutu and upper Essequibos, Kwitara River, Rupununi, both from 1964. AMNH keeps a specimen from Kalacoon, undated.

French Guiana – It is widely distributed in forest areas, and is more common than Harpy Eagle in disturbed forests, however, it is not significantly more common in primary forest (Thiollay 2007). Julliot (1994) reports predation by the Crested Eagle on a young spider monkey (*Atteles paniscus*), at Nouragues Station, which took place in 1992. In August 2011, an extreme-dark-morph individual was photographed on the banks of the Approuague River (J. Tascon, pers. comm.). The Macouria Zoo in Guyana maintains a live specimen, dark-morph, possibly a male, with unknown origin (Maxcobigo, *In* IBC).

Suriname – Apparently a rare bird in primary forest, sometimes seen wandering into areas of the coast (Haverschmidt & Mees 1994). Possibly a resident, but no reproductive activity has been noted in the country. On the list of birds from Raleigh Falls-Voltzberg Nature Reserve, Sipaliwini District, where it was seen in a predation attempt on Guianan Cock-of-the-rock (*Rupicola rupicola*) (Trail 1987).

Argentina – Species considered to be resident (Mazar-Barnett & Pearman 2001). Pearman (2001) considers the species a casual visitor to Misiones, and reports the observation of an adult in El Piñalito Provincial Park. There are earlier records in Santa Ana (Bertoni 1913) and at Iguazú National Park, a pair displaying, recorded in September 1980 by Rumboll & Straneck (*In* Olog 1985).

Paraguay – Del Castillo & Clay (2004) consider the species rare, but reproductively active in Alto Paraná. There are two visual records during a survey conducted in the San Rafael del Parana National Park, in Itapúa (Madroño-Nieto *et al.* 1997). The first confirmed record occurred in 2002, at the same place, where a specimen was captured and donated to the Itaipu Binacional Zoo, which survived until 2002 (Del Castillo & Clay 2004, Museum of Natural History of Itaipu Binacional). Another record also occurred near the Aurora Colony, in the same region of the San Rafael del Parana National

Park, of an individual in flight in December 2003 (N. Lopes, *In* Del Castillo & Clay 2004).

Review of the distribution of the Crested Eagle in Brazil

Of the 130 records obtained for Crested Eagle from Brazil, 60 were sourced from published literature in books or articles, 18 came from records in museums and collections, and 34 were obtained from online databases, recordings of vocalizations and photos from personal archives, and 18 came from the PCGR Database. From these, seven records are located outside the distribution map provided by IUCN (Figure 1), enlarging the area of occurrence to the northeast, southeast and south, and are highlighted in bold in Appendix 1.

The majority of the records (70%) were outside conservation units, 27 records (21%) were from National Conservation Reserves and 12 (8%) were from County, Municipal or Private Reserves.

For each state we include the Brazilian region (South, Southeastern, Northeastern, Central and Northern Brazil) and abbreviations for the biome occupied (ARF-Atlantic Rainforest, AMZ-Amazonian Rainforest, and ECO – Ecotone Biome Cerrado/Gallery Forest).

Rio Grande do Sul (South-ARF) – There are only three historical records. The oldest comes from Ihering (1899), near the municipality of Taquara; its occurrence is also suggested at the Turvo River Reserve (Belton 1984). Bencke (1997) provides the last record from Santa Cruz do Sul in 1920. Considered very rare in the state by Sick (1997), it is currently classified as ‘Probably Extinct’ (Marques *et al.* 2002).

Santa Catarina (South-ARF) – There are five records of the species: in 1977 it was seen in Jordão Baixo (Siderópolis) by Albuquerque (1983); Rosário (1996) provides a record in Siderópolis; and another record in 2005, in Aiúre, in the municipality of Grão-Pará, in the foothills of Serra Geral (Albuquerque *et al.* 2006). Records from museums in Santa Catarina are unreliable, since they come from private collections, without scientific identification of locality. There is a specimen in Frei Miguel Museum, in Luzerna, from the locality of Joinville, prepared in 1926 (Favretto 2008). Recently a specimen at the Universidade de Santa Catarina (UFSC) was analyzed, which had been previously classified as a Harpy Eagle. We confirmed that it was a Crested Eagle. This specimen was collected between 1965-1970 in the municipality of Lontras, by G. Knolle, also for his private collection, and was subsequently donated to the Ornithological Collection of UFSC. There is an adult mounted specimen, pale-morph, sex undetermined, unknown origin, in the private collection of Museu do Índio, in Florianópolis.

Paraná (South-ARF) – The occurrence of the species was registered only at Marechal Cândido Rondon in 1964. This is a mounted specimen, housed in the Sete Quedas Museum, and similar to the previous cases, it was from a private collection (Straube & Urben-Filho 2010). The species possibly occurs at Iguaçu National Park, where well-preserved forest still remains (Forrester 1993).

São Paulo (Southeastern-ARF) – The first citation found was Ihering (1898), which dealt with the collecting a Harpy Eagle and likely (but not confirmed) occurrence of the Crested Eagle in the state. More recently, it was recorded in large reserves protected by the State government, known as State Parks (P. E.): twice in Jacupiranga P.E. (1990 and 1992), once in the Morro do Diabo P.E. (1992) and, once in Intervalos P.E. (1995). In the first two records the birds were soaring, and in the last, landing (Galetti *et al.* 1997). In both cases only visual records were made. At the MZUSP Collection, there is a specimen from Apiaí, collected in 1900. MHNT has a mounted specimen displayed, however of unknown procedence. In the Itatiba Zooparque, there is a pale and dark-morph pair on display, both with unknown origin.

Rio de Janeiro (Southeastern-ARF) – There is only one historical record, from Pinto (1964) for the locality of Cantagalo, and from this same location, there is a skin in the collection of Johann Natterer (Hellmayr & Conover 1949). At the National Museum of Rio de Janeiro there are five specimens listed, however all are of unknown origin.

Espírito Santo (Southeastern-ARF) – There are two records: an observation at Sooretama Biological Reserve, Sooretama, by Parker & Goerck (1997) and another in Itaúnas State Park (Petroff 2001). At the Museu Biológico Mello Leitão, Santa Teresa (MBML) there is one mounted specimen of unknown origin and without registration number.

Minas Gerais (Southeastern-ARF) – There are two records. The first record is listed on the state list (Mattos *et al.* 1993), as having been seen in Mata Escura Biological Reserve, in Jequitinhonha (T. Mattos, pers. comm). The second record occurred in the Caparaó National Park, in Alto Caparaó, in 1997, in which two individuals were seen flying, which was probably a pair (Zorzini *et al.* 2006). CRAX maintains a live female dark-morph, previously paired with a male pale-morph borrowed from the São Paulo Zoo, but which died later (individual donated to Universidade Federal de Minas Gerais-UFMG, however it has not yet been taxidermized), both of unknown origin. Recently CRAX received another dark-morph female, from Pará (ICMBio).

Bahia (Northeastern-ARF) – There are two records: Willis & Oniki (2003) comment on an aural record in Porto Seguro, in 1974. There is also a visual record in the municipality of Barrolândia, municipality of Belmonte, 1995 (Galetti *et al.* 1997).

The remaining Brazilian Northeastern states generally do not have records of the species, whether historical or recent ones; however, Dois Irmãos Zoo in Recife, Pernambuco, exhibits an adult pale-morph, of unknown origin.

Mato Grosso do Sul (Central Brazil-ECO) – P. Scherer and C. Ribas report the species in April 2001, flying over a road near the Private Natural Reserve (RPPN) Buraco das Araras, in the municipality of Jardim (In Pivatto *et al.* 2006). This region is savanna (Cerrado) with Gallery Forest.

Mato Grosso (Central Brazil-AMZ) – There are nine records for the species. The oldest record comes from Chapada dos Parecis, in Juruena (Sick 1997). In 2005, an individual was photographed along the Cristalino River (A. Lees, pers. file), and in 2006, two individuals were seen and photographed on the CEPLAC Farm (Executive Board of the Cocoa Crop Plan), both in Alta Floresta (A. Lees, pers. comm.). In 2011 one individual was photographed at the Jardins da Amazonia Inn, in São José do Rio Claro (E. Endrigo, pers. comm.), and in 2012, a pair was recorded responding aggressively to playback, in the same locality, where possibly there was a nest (M. Pádua, pers. comm.); in October 2012 in the Cristalino RPPN, an adult was drying itself in the canopy, after a heavy rain (J. Silveira, pers. comm.). In addition to these, photographic records were also made in 2012 in the municipality of Comodoro, (D. Mota and V. Castro, pers. comm.). In September 2012, a nest with a nestling (4–5 months old) was located in the municipality of Paranaíta, at the Ouro Reunido Farm (P. Bernardo, pers. comm. and D. Oliveira, pers. comm.). At MZUSP, one specimen is listed from the Ipê Farm, in Vila Rica. CETAS-IBAMA pre-release facility in Guarantã do Norte is housing a live young female pale-morph from the municipality of Novo Progresso, PA, currently still being held.

Rondonia (North-AMZ) – There are nine records. Between 1987 and 1988, the Crested Eagle has been registered at the Cachoeira Nazaré, close to the Ji-Paraná River by Stotz *et al.* (1997). In 2003, Olmos *et al.* (2011) recorded three individuals in Serra Cutia, between the municipalities of Guajarã-Mirim and Costa Marques, besides having verified the existence of native craftsmanship using feathers of the bird. In January 2010 an adult individual was seen in Chupinguaia (K. Okada, pers. com.); at the same locality, in September 2010, a nest was found close to the previous record, with an active pair and a nestling (M. Canuto, pers. file). The nest was visited in October by the PCGR Team, who found it on the ground, because the tree had fallen. In January 2012, at the same locality, an adult was seen during an avifauna inventory (R. Hippolito, pers. comm.), possibly one of the members of the resident pair. In 2011, next to the Ramal do Rio das Garças, in Porto Velho, an individual was

photographed (F. Pereira). In March 2012, in Guaporé Biological Reserve, between São Francisco do Guaporé and Alta Floresta D'Oeste, an individual dark-morph was recorded calling next to a group of small primates (S. Alves, ICMBio/ReBio Guaporé, pers. comm. and file).

Acre (North-AMZ) – There are seven records. The first citation comes from Catuaba Experimental Farm – Universidade Federal do Acre-UFAC, near Rio Branco, between 1994 and 2004 (Rasmussen *et al.* 2005). The second record comes from the Alto Juruá Extractive Reserve, in Marechal Thaumaturgo (Whittaker *et al.* 2002). In 2008, DeLuca (2012) registers, through interviews with the locals, the presence of Harpy Eagle and Crested Eagle at the Chico Mendes Extractive Reserve and environs, comprising Assis Brazil, Brasiléia and Xapuri municipalities. In addition to this, and confirmed with a photograph, an adult dark-morph was seen in Rio Croa Community, municipality of Cruzeiro do Sul, in August 2012 (J. Filho), and Guilherme (2012) cites the species as resident for the whole State, using bamboo forests and rainforests with palm trees. In April 2013, a young pale-morph was seen flying in the municipality of Porto Acre (L. Rondini and T. Nascimento, pers. comm.). In 2009 a young specimen was rescued near Rio Branco, and forwarded to CETAS-IBAMA of Rio Branco, and later transferred to permanent captivity, but we were not able to determine if it is still alive.

Amazonas (North-AMZ) – There are 16 recognized records/locations. The first record cites the occurrence of species in “Barra do Rio Negro” [=Manaus] and in Manaqueri [=Manaquiri] Lake (Manacapuru municipality) (Von Pelzeln, 1871), localities also replicated by Pinto (1964). In this same state one of the best-known papers about the species, Bierregaard (1984) described nesting of a pair, the male being pale-morph and the female, dark-morph, at the ZF-3 Reserve, 60 km north of Manaus (Gavião Camp-PDBFF Biological Dynamics of Forest Fragments Project) but the pair has not been registered subsequently. In 2004 an adult was observed at the Mamirauá Sustainable Development Reserve (RDS), in Tefé, Amazonas state, in a varzea forest (Cintra *et al.* 2007 and R. Cintra, pers. comm.). Olmos *et al.* (2006) also cite seeing two individuals resting and feeding, in the municipality of Alvarães. Cohn-Haft *et al.* (1997) cites its occurrence in large forest fragments of the PDBFF Project (Esteio, Dimona and Porto Alegre Farms) near Manaus. In the Adolpho Ducke Forest Reserve, Manaus, in 2005, an individual was spotted (J. Valsko, pers. comm.) and recorded vocalizing (W. Magnusson, pers. comm. and file at PCGR Database). There is also a record of the species in the Juami-Jupará Ecological Station, in 2006 (T.M.S. In Soares *et al.* 2008: 76). In July 2009 an adult pale-morph was photographed in the Anavilhanas National Park, perched on treetops in flooded

forest (S. V. Wilson, pers. comm. and photo), and in June 2012, at the same location, a pair was seen carrying prey, probably for a nest (A. Whittaker, pers. comm.); however on a visit in 2013 the nest was not found (FBRG). On the banks of the Roosevelt River in Novo Aripuaná, on 2 July 2007, a pale-morph adult was seen in the canopy of a tree (B. Whitney, video IBC & pers. comm.), and on 12 September 2007 a pair and 17 September a subadult. Whittaker (in 2009) recorded an individual on the banks of the same river, and another around the lodging. In 2008, it was seen on the Urucu River, and also a nest (not studied by PCGR) (Whittaker *et al.* 2008). In 2011, an individual was photographed in Tapauá, in Nascentes do Lago Jari National Park (L. Condrati, pers. comm., ICMBio). In April 2013, a sub-adult pale-morph was seen on ZF-2 Road, 10 km from the Cuieiras Reserve nest known in the locality, interacting aggressively with a flock of Red-throated Caracaras (*Ibycter americanus*). Possibly this is a nestling from this nest, which has dispersed for two or three years (whitish general plumage, with wing coverts still grayish) (FBRG). In Amazonas, PCGR monitors four nests of this species, one in Manaus and three in the nearby town of Manacapuru. In Manaus, the nest is located in the Cuieiras Reserve (INPA), and was found by members of the TEAM Project – INPA in 2006, and has been monitored by PCGR since then (In Soares *et al.* 2008). The nests in Manacapuru, located on Cururu Lake, in a rural area of the municipality, were found and reported by local residents, and have been monitored since 2007. Recently a nest was discovered in August 2013, which is being monitored in Amaná RDS (Sustainable Development Reserve), under the auspices of the Mamirauá Sustainable Development Institute (IDSM). In addition to these *in vivo* records, the Instituto Nacional de Pesquisas da Amazônia INPA - Ornithological Collection, holds a 1982 pale-morph female specimen, from the ZF-3 Reserve. Listed in MZUSP are a female, from October 1902, and a male, from January 1937, from the Juruá River (for our map assumed as near Carauari), and another female from Manacapuru, dated October 1936. FMNH holds two skins of females: one from Lábrea, on the Purus River, 1935, and another from Lago do Baptista, in Itacoatiara, 1937. CM maintains a mounted specimen, collected in Tonantins, on the left bank of the Solimões River, in 1923. The CIGS Zoo (Manaus), kept a pale-morph male, however it died 17 July 2012 and was not preserved.

Roraima (North-AMZ) – The species was recorded at the Maracá Ecological Station by Moskovits *et al.* (1985). In 2004, an adult was photographed in the Viruá National Park, in Caracará (R. Czaban, IBAMA). In 2011, during a MZUSP expedition, an adult pale-morph was recorded, near the community of Caicubí, in the Jufari River, near Caracará (L. F. Silveira, pers. comm.).

Pará (North-AMZ) – There are 28 recognized localities/records for the species. The first reference is prior to the date of its description, Daudin (1800). In “Memórias de Dom Lourenço Álvares Roxo de Potflis”, from 1752, translated and analyzed by Teixeira *et al.* (2010), the author makes a detailed description of the Harpy Eagle, and then describes the “ouyrà ouassù meri ou ouassù peua” a very similar bird to the Harpy Eagle, except for its more slender appearance (Teixeira *et al.* 2010). In the description, he is obviously describing the Crested Eagle however the “Memories” is not a scientific paper. In our most recent records, the species was seen in 2000, Taboca Island, Xingu River, and in 2008, in an Aquatic Bird Survey, Xingu River, both in forest (Henriques *et al.* 2008 and L. M. P. Henriques, pers. comm.); in September 2013, an adult pale-morph was photographed in Vitória do Xingu (V. Castro, pers. comm.). In February 2014 an adult pale-morph was observed on the left bank of the Xingu River, in Brasil Novo, near Altamira (TMS, PCGR Database). In Tapajós National Forest, by Henriques *et al.* (2003); in the Tapajós-Arapiuns Extractive Reserve, by Peres *et al.* (2003) and, in the municipality of Tailândia (Soares *et al.* 2008). Between 1998 and 2005, individuals were recorded in Tailândia, at the Agropalma Forest Reserve; between 2004 and 2006, in the municipality of Tomé-Açu, on the Cauaxi Farm; and between 2005 and 2007, also in Tailândia, on the Capim Farm (Portes *et al.* 2011). Throughout 2008, individuals were recorded in several forest reserves, Trombetas, Grão-Pará, Maicuru (female pale-morph collected) and in Faro State Forest (Aleixo *et al.* 2011). In Santana do Araguaia, at the Fartura Farm, the species was recorded between 2009 and 2010 (Somenzari *et al.* 2011). Between 2010 and 2011, the species was also recorded in Paragominas by Lees *et al.* (2012). In mid-2012 an adult was seen on the banks of the Tapajós River, in the municipality of Itaituba (G. Leite, pers. comm.); In mid-2012, a nestling female, dark-morph was rescued by IBAMA-Marabá, from the municipality of Tucuruí, and delivered to the Parque Zoo Botânico VALE in Parauapebas-Carajás, and from there transferred to recovery at the CRAX Conservation Center (F. Martins, pers. comm. ICMBio, PCGR). In the same year, a second nestling, also female from an unknown nest in the municipality of Novo Progresso, is still being held in the IBAMA-CETAS pre-release facility from Guarantã do Norte. In 2010 a nest was recorded in Belterra municipality. It was found during an inventory of birds in the region, and reported to PCGR, which we monitored for a few months, since the nestling was approximately four months old and out of the nest (C. Andretti, pers. comm.); the record was subsequently published with details by Lees *et al.* (2013). In 2011 there was a record in Jacareacanga, near the Teles Pires River (C. Borges, pers. comm.). In 2012, another nest of the species was

located in the municipality of Oriximiná during mining activities of Mineração Rio Norte. This nest is located in an area of bauxite ore extraction within Porto Trombetas National Forest and following the recommendations of the PCGR and IBAMA-Oriximiná, the area will be maintained and protected. The Museu Paraense Emilio Goeldi holds a primary feather collected in 2000, from Altamira, Xingu River, and the skin of a female pale-morph adult from 2008, collected in Almeirim, in the Maicuru Biological Reserve, besides two skins of young males without provenance; and two specimens from the collection of the Museu Goeldi Zoo Botanical Park, one from 1916 and another from 1975. The FMNH keeps two skins of Piquiatuba in Belterra, collected in 1937: a female and a male with enlarged gonads, possibly being a pair in reproductive condition.

Amapá (North-AMZ) – There are four different records. The first two, in 1994 and 2000, individuals were alone, resting and feeding, in the municipality of Serra do Navio (Olmos *et al.* 2006). The other two records were provided by Schunck *et al.* (2011), one in 2008 and another in 2010. These are in the Carajás Extractive Reserve, in the municipality of Laranjal do Jari, western Amapá. CM maintains a skin of a specimen collected in 1918, in the upper Arucaua River, a tributary of Uaca River, in Oiapoque.

Maranhão (North-AMZ) – The oldest record is that of a male from the mouth of the Flores River, Mearim River, municipality of Pedreiras, listed in the collection of birds of the Museu da Fauna (No. 1576), from 1956 (Aguirre & Aldrichi 1983, same specimen under Rio de Janeiro). A slightly more recent record is of a nest found and monitored for a few days in November 1997, in the municipality of Buriticupu (Martínez 2008). Recently, in 2009, during the movement of mobbing by a mixed bird species flock, after tape playback of Amazonian Pygmy-Owl (*Glaucidium hardyi*), a young Crested Eagle was attracted and registered in the municipality of Açailândia (F. Olmos and B. Lima, pers. comm.).

DISCUSSION

Up to 2006 *M. guianensis* was recorded at nine Brazilian National and State Reserves (ESEC, RESEX, FLONA, REBIO, PARNA, State Park) (Soares *et al.* 2008). Based on the compilation presented herein, the number of conservation areas of the same category as above harboring stocks of *M. guianensis* increased to 27, three times the previous study. Besides this increase, we also added 11 private reserve localities.

From 37 New records outside the IUCN map, 16 were recorded close to the border of the known range (up to 40 km); of those, 13 records were Old records and

three were New, and do not expand or contribute to the distribution map, and could be an artefact of the border between our datapoints and the IUCN map, or were provided as only general occurrence in the literature, and therefore will not be discussed in detail.

Far from the border of the IUCN map (> 40 km), we found 21 records, contributing to an expansion of the known range; of these, 10 are New records and 11 are Old, and noted in bold face in the Appendices.

Mexico, at the northernmost extreme of distribution, the range was extended north to Southern Mexico, at Montes Azules, in 2004 with a photo (Grosselet & Gutierrez-Carbonel (2007), confirming the record (No. 132, Appendix 2).

Nicaragua, in 2001 a visual record in Prinzapolka (Kjeldsen 2005: 39) extended the range farther south than the IUCN map (No. 155, Appendix 2). In addition, there are currently two records at the southern border with Costa Rica, in 1994 and 1999 (Old records), published only in 2007 (Munera-Roldan 2007: 155), which extends the distribution of the Crested Eagle to Reserva Bartola, (Nos. 153 and 154, Appendix 2).

Costa Rica, an Old record not considered on the IUCN map was a visual record of Slud (1964) at Cañas Gordas (No. 159, Appendix 2), located between the Sirena Biological Station (Corcovado N. P.) on the Osa Peninsula (No. 157, Appendix 2) and the Caribbean lowland distribution.

Colombia, an Old record not considered on the IUCN map is a skin from Cuturu (FMNH 190728; No. 212, Appendix 2) from 1947, located between Darien Peninsula and Perija Mountains.

Brazil, there is a New overhead visual record at Buraco das Araras Private Natural Reserve, Mato Grosso do Sul (No. 63, Appendix 1) in Pivatto *et al.* (2006), an ecotone between Cerrado Biome and Gallery Forests, and could have been an individual dispersing, or transient, from Bodoquena Forest, where there are Harpy Eagles recorded, and which could possibly also support populations of Crested Eagle (PCGR Database). Bodoquena Forest is a upland remnant of Atlantic Rainforest on the ecotone with Semideciduous Forest, previously connected with Morro do Diabo, São Paulo (Galetti *et al.* 1997) (No. 125, Appendix 1), an Old record not included on the IUCN map. In Minas Gerais, there are two records far from the border of IUCN, but near the Atlantic Rainforest, and the IUCN distribution could incorporate these records, which are two visual records, in Mata Escura Reserve before 1993 (Mattos *et al.* 1993) (No. 65, Appendix 1), and Caparaó Park in 1997 (Zorzin *et al.* 2006) (No. 64, Appendix 1). In southern Brazil, in Rio Grande do Sul, there is a confirmed Old record, a specimen collected in 1920 from Santa Cruz do Sul, housed in a private collection (Bencke 1997) (No. 101, Appendix 1), and

another collected in 1899 by Ihering (cited by Belton 1984 for Taquara, without details of the record).

Final Remarks

The most commonly cited publications for studying birds of prey, Ferguson-Lees & Christie (2001) and Amadon & Bull (1988), and more recently Whitacre *et al.* (2012), indicate the distribution of Crested Eagle in parts of North and Central America, and throughout South America, however the most commonly used tool for conservation strategies, the IUCN map, presents this distribution in a far more conservative form. Here it is possible to add the southernmost part of North America (Chiapas and Campeche), in southern Mexico to the range of the Crested Eagle, as well as three records in between the Amazon and Atlantic Rainforests, and one record in a forest patch within the Gran Sabana, Venezuela.

Our review suggests new data to be added in the compilation of the IUCN map, which from now on provides a database for the production of an updated species distribution map, extending known area of occurrence of the Crested Eagle. In southeastern Brazil, there are records previously not considered in the States of Minas Gerais and Bahia, in the central State of Mato Grosso do Sul and to the North, new habitat records in Roraima, Maranhão and Mato Grosso. Understanding the distribution of the Crested Eagle is indispensable for the efficient development of conservation strategies for the species and the ideal determination of the risk the species runs of extinction.

The Amazon is one of the current strongholds where large vertebrate populations find conditions to persist for ongoing generations (Reed *et al.* 2003). The prospect is of a future ideal for the conservation of large forest eagles (Crested Eagle, Harpy Eagle and Hawk-Eagle spp.). Predictive modelling scenarios for the next decades, according to current development policies, indicate an increase in the “arc of deforestation”, the reduction of forest cover together with climate change (Laurance *et al.* 2001; Salazar *et al.* 2007), which could seriously reduce its distribution.

Brazilian law requires preservation of forest on private land (called Legal Forest Reserve) in the Amazon rainforest to be 80% of the propriety (“Lei N° 12.651, de 25 de maio de 2012”). Landowners who cut beyond the allowed percentage are supposed to replant with trees. The majority of Brazilian records come from private land, therefore a large effort should be carried out to maintain Legal Forest Reserves, areas which are not protected in conservation reserves. The Crested Eagle is listed as Near-Threatened (NT) by the IUCN (2014) and has already been proposed for the status of “Endangered” for the Brazilian List of Species threatened with Extinction,

under review (PCGR and ICMBio), since the habitat that holds the largest populations is also under great risk, particularly in the future. Owing to the current scarcity of knowledge on the distribution and ecology of the Crested Eagle, it is possible that populations living in poorly sampled or little known areas could go extinct even before conservation programs or policies for the species's preservation are devised.

We believe that the greatest impact on populations of Crested Eagle is habitat loss and destruction, hunting pressure and consequently, pressure on their prey and nesting areas, mainly on the southern edges of the Amazon Rainforest and in the Southeast region of Brazil, in the remnants of Atlantic Rainforest.

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APPENDIX 1

Databases, museums and personal communications of Crested Eagle records from Brazil were cited using the following nomenclatures. **State:** (M. G. do Sul) – Mato Grosso do Sul; (R. G. do Sul) – Rio Grande do Sul. **Locality:** RESEX – Extractive Reserve; ESEC – Ecological Station; ARIE – Relevant Interest Ecological Area; PARNA – National Park; RDS – Sustainable Development Reserve; RPPN – Private Natural Reserve; REBIO – Biological Reserve; FLONA – National Forest; CEPLAC – Executive Board of the Cocoa Crop Plan; CIGS – Jungle Instruction Army Center; CETAS – Wildlife Center of Ibama – IBAMA – Brazilian Environment Agency; CRAX – Criadouro Conservacionista Center; PCGR – Harpy Eagle Conservation Program - Brazil. **Museums and Collections:** MZUSP – Zoology Museum of the University of São Paulo; MNRJ – National Museum of Rio de Janeiro; UFSC – Federal University of Santa Catarina; MHNT – Taubaté Natural History Museum; ORNIS – Online database of Ornithological Collections; CM – Carnegie Museum of Natural History; FMNH – Field Museum of Natural History; MPEG – Museu Paraense Emílio Goeldi; INPA – Instituto Nacional de Pesquisas da Amazônia Collections; WA – www.wikiaves.com data; IBC – The Internet Bird Collection. **Record Type:** Occu – general region of occurrence cited in literature, without specific records, number of sights, number or data on individuals, Ind. – one specimen record, 2ind – two specimen records. **Sex/ Age/Plumage:** n.a. – not available, Ppale – pale-morph plumage, Pdark – dark- morph plumage.

No.	State	Municipality	Locality	Date	Record Source	No. Collection / Museum/Source	Record type	Sex / Age / Plumage/Nest
1	Acre	Rio Branco	Catuaba Farm	1999-2004	Rasmussem <i>et al.</i> 2013	Literature	occurrence	n.a.
2	Acre	Marechal Thaumaturgo	Alto Juruá RESEX	2002	Whittaker <i>et al.</i> 2002	Literature	occurrence	n.a.
3	Acre	Assis Brasil, Brasíliaia and Xapuri	Chico Mendes RESEX	2008	De Luca 2012	Literature	occurrence	n.a.
4	Acre	Rio Branco		2009	IBAMA Report - Rio Branco, AC	PCGR Database	report	young
5	Acre	Porto Acre		2013	L. Rondini (photo); T. Nascimento (visual)	WA 959961	photo	young
6	Acre		Bamboo and Palm forest - occurrence in the state not on map	n.a.	Guilherme 2012	Literature	occurrence	n.a.
7	Acre	Cruzeiro do Sul	Rio Croa Community	2012	João D. Filho pers. comm.	WA 722798	photo	adult/Pdark
8	Amapá	Oiapoque	Uaca River	1918	CM	CM P68846	skin	n.a.
9	Amapá	Serra do Navio		1994	Olmos <i>et al.</i> 2006	Literature	visual	n.a.
10	Amapá	Serra do Navio		2000	Olmos <i>et al.</i> 2007	Literature	visual	n.a.
11	Amapá	Laranjal do Jari	Rio Carajá RESEX	2008	Schunck <i>et al.</i> 2011	Literature	occurrence	n.a.
12	Amapá	Laranjal do Jari	Rio Carajá RESEX	2010	Schunck <i>et al.</i> 2012	Literature	occurrence	n.a.
13	Amazonas	Japurá	Juami-Jupará ESEC	2005	Soares <i>et al.</i> 2008, Sanaiotti per.obs.	PCGR Database	visual/ predation	adult
14	Amazonas		Cuieiras and Manacapuru - not on map	2006, 2007	Soares <i>et al.</i> 2008, Sanaiotti per.obs.	PCGR Database	nest	nest
15	Amazonas	Novo Aripuanã	Rio Roosevelt Lodge	1988	Whittaker 2009	Literature	occurrence	pair

No.	State	Municipality	Locality	Date	Record Source	No. Collection / Museum/Source	Record type	Sex / Age / Plumage/Nest
16	Amazonas	Manacapuru		1936	MZUSP	MZUSP 16442	skin	
17	Amazonas	Lábrea	Purús River	1935	FMNH	FMNH 100819	skin	female
18	Amazonas	Itacoatiara	Baptista Lake	1937	FMNH	FMNH 101835	skin	female
19	Amazonas	Tonatins	Solimões River	1923	CM	CM P97629	mounted specimen	n.a.
20	Amazonas	Rio Preto da Eva	Reserve ZF3 - ARIE	1982	INPA	INPA 590	skin	n.a.
21	Amazonas	assumed near Carauari	Juruá River	1902	MZUSP	MZUSP 2593	skin	female
22	Amazonas	assumed near Carauari	Juruá River	1937	MZUSP	MZUSP 18113	skin	male
23	Amazonas	Novo Aripuaná	Roosevelt River	2007	Bret Whitney pers. comm.	IBC	Video	adult/Ppale
24	Amazonas	Coari	Urucu River	2008	Whittaker <i>et. al.</i> 2008	Literature	visual	pair/young/nest
25	Amazonas	Alvarães		1993	Olmos <i>et al.</i> 2006	Literature	visual	2 individuals
26	Amazonas		Citation von Pelzeln - not on map	n.a.	Pinto, 1964	Literature	occurrence	n.a.
27	Amazonas	Barra do rio Negro [= presently Manaus]	not on map	n.a.	Von Pelzeln 1871	Literature	occurrence	n.a.
28	Amazonas	Manacapuru	Manaqueri [= Manaquiri] Lake - not on map	n.a.	Von Pelzeln 1872	Literature	occurrence	n.a.
29	Amazonas	Rio Preto da Eva	ZF3 Reserve, Gavião camp - PDBFF Project - ARIE	1980	Bierregaard 1984	Literature	literature/photo	pair/nest
30	Amazonas	Rio Preto da Eva	PDBFF Project Forest Fragments - ARIE	n.a.	Cohn-Haft <i>et al.</i> 1997	Literature	occurrence	n.a.
31	Amazonas	Manaus	Reserva Florestal Adolpho Ducke - ARIE	2005	J. Valsko; W. Magnusson, PCGR	Database/pers. comm.	visual/call record	young
32	Amazonas	Novo Airão	Anavilhanas PARNA	11,22/6/2012	Whittaker 2012	WA 735004	photo	pair
33	Amazonas	Novo Airão	Anavilhanas PARNA	2009	S. Wilson, PCGR	Database	photo	1 adult
34	Amazonas	Manacapuru	Cururu Lake, Solimões River	2007	PCGR	Database	nest - Teixeirainha	nest - Teixeirainha
35	Amazonas	Manacapuru	Cururu Lake, Solimões River	2008	PCGR	Database	nest - Bracelo	nest - Bracelo
36	Amazonas	Manacapuru	Cururu Lake, Solimões River	2008	PCGR	Database	nest - Erivan	nest - Erivan
37	Amazonas	Manaus	Cuieiras Reserve - ARIE	2006	PCGR	Database	nest - Cuieiras	nest - Cuieiras
38	Amazonas	Tapaua	Nascentes do Lago Jari PARNA	2011	Luiz Henrique Condradi pers. comm.	WA 414010	photo	adult/Ppale
39	Amazonas	Manaus	Cuieiras Reserve, Km 9 - ARIE	2013	F. B. R. Gomes	WA 1025169	photo	subadult

No.	State	Municipality	Locality	Date	Record Source	No. Collection / Museum/Source	Record type	Sex / Age / Plumage/Nest
40	Amazonas	Amaná	Amaná RDS	2013	A. Jaskulski pers. comm.	WA 1067156; 1067159; 1067157	photo	pair/young/ nest
41	Amazonas		CIGS Army Zoo, unknown procedence	died 2012	F. B. R. Gomes	Pers. Archive	photo	male/Ppale
42	Amazonas	Alvarães, Uarini, Fonte Boa, Tonatins, Marãã and Japurá	Ressaca do Panelão - Mamirauá RDS	2004	Cintra <i>et al.</i> 2007	Lit. and pers. comm.	visual	n.a.
43	Bahia	Belmonte	Barrolândia	1995	Galetti <i>et al.</i> 1997	Literature	visual	adult
44	Bahia	Porto Seguro		1974	Willis & Oniki 2003	Literature	occurrence/ call	n.a.
45	Espírito Santo	Sooretama, Linhares, Jaguarié and Vila Valério	Sooretama REBIO	1997	Parker III & Goerck 1997	Literature	occurrence/ visual	n.a.
46	Espírito Santo	Conceição da Barra	Itaúnas State Park	n.a.	Petroff 2001	Literature	occurrence/ visual	n.a.
47	Espírito Santo		Museu de Biologia Mello Leitão - unknown procedence	n.a.	PCGR visited 2006	Database	skin	Ppale
48	Maranhão	Pedreiras	Flores River	1956	Aguirre & Aldrighi 1983	Museu da Fauna N.1576	skin	male
49	Maranhão	Buriticupu	Southeastern Buriticupu	1997	Martínez 1997	Literature	nest	adult/young/ nest
50	Maranhão	Açailândia		2009	Fábio Olmos and Bruno Lima	Visual record and pers. comm	visual	young
51	Mato Grosso	Alta Floresta	Cristalino River	2005	Alexander Lees pers. arch.	Photo pers	photo	young
52	Mato Grosso	Juruena	Chapada dos Parecis	n.a.	Sick, 1997	Literature	occurrence	n.a.
53	Mato Grosso	Alta Floresta	CEPLAC	2006	Alexander Lees	Visual record	visual	adult
54	Mato Grosso	Alta Floresta	CEPLAC	2006	Alexander Lees	WA 349411	photo	adult
55	Mato Grosso	São José do Rio Claro	Jardim da Amazônia Lodge	2011	Edson Endrigo	WA 368198	adult	adult
56	Mato Grosso	São José do Rio Claro	Jardim da Amazônia Lodge	2012	Marcelo Pádua	Call recorded	call recorded	pair/adult
57	Mato Grosso	Mundo Novo	Cristalino RPPN	2012	Júlio Silveira	WA 804572	photo	adult
58	Mato Grosso	Comodoro		2012	Vitor Castro	WA 581114	photo	1 adult
59	Mato Grosso	Comodoro		2012	Daniilo Mota	WA 669576	photo	1 adult
60	Mato Grosso	Paranaíta		2012	Dalci Oliveira and P. Bernardo	WA 879011 and pers. comm.	photo	nest
61	Mato Grosso	Vila Rica	Ipê Farm	n.a.	MZUSP	MZUSP 78122	skin	n.a.

No.	State	Municipality	Locality	Date	Record Source	No. Collection / Museum/Source	Record type	Sex / Age / Plumage/Nest
62	Mato Grosso							
63	M. G. do Sul	Jardim	Buraco das Araras RPPN	2001	Pivatto <i>et al.</i> 2006	Literature	visual	adult/Ppale/ flying
64	Minas Gerais	Caparaó	Caparaó PARNA	1997	Zorzin <i>et al.</i> 2006	Literature	visual	pair flying
65	Minas Gerais	Jequitinhonha	Mata Escura REBIO	n.a.	Mattos <i>et al.</i> 1993	Literature	occurrence	n.a.
66	Minas Gerais		CRAX - Conservationist Center - unknown precedence	n.a.	CRAX	PCGR Database		female/Pdark
67	Pernambuco		Dois Irmãos Zoo - unknown precedence	n.a.	PCGR Database	PCGR Database		adult/Ppale
68	Pará	Vitória do Xingu	Ilha da Taboca "Area 2", Xingu River	2000	Henriques <i>et al.</i> 2008	Lit. and pers. comm.	visual	adult
69	Pará	Vitória do Xingu	Transect 6, Area 2, Aquatic Survey, Xingu River	2008	Henriques <i>et al.</i> 2008	Lit. and pers. comm.	visual	adult
70	Pará	Belterra	Paraíso das Abelhas sem Ferrão	2010	Christian Andreotti and Lees <i>et al.</i> 2013	WA 522322 and Literature	photo	nest/young
71	Pará	Vitória do Xingu		2013	Vitor Castro	WA 1091697	photo	n.a.
72	Pará	Itaituba	Right bank of Tapajos River	2012	Gabriel Leite	WA 1036295	photo	n.a.
73	Pará	Jacareacanga	Near Teles Pires River	2011	Christopher Borges	WA 844120	photo	adult
74	Pará	Faro	Faro State Park	15_28/1/2008	Aleixo <i>et al.</i> 2011	Literature	occurrence	n.a.
75	Pará	Oriximiná	Trombetas State Park	16_28/4/2008	Aleixo <i>et al.</i> 2011	Literature	occurrence	n.a.
76	Pará	Óbidos, Alenquer, Oriximiná and Monte Alegre	Grão-Pará ESEC	28/8_10/9/2008	Aleixo <i>et al.</i> 2011	Literature	occurrence	n.a.
77	Pará	Oriximiná	Trombetas State Park	2012	IBAMA Report - Oriximiná, PA	PCGR Database		nest
78	Pará	Altamira	Ilha da Taboca - Xingu River	2000	MPEG	MPEG 55570	remige	n.a.
79	Pará	Almeirim	Maicuru REBIO	2/10_5/11/2008	Aleixo <i>et al.</i> 2011 and MPEG	MPEG 66390	skin	female/Ppale
80	Pará		Museu Paraense Emílio Goeldi - unknown precedence	1916	MPEG	MPEG 1287	skin	young/male
81	Pará		Museu Paraense Emílio Goeldi - unknown precedence	1975	MPEG	MPEG 30888	skin	young/male
82	Pará	Belterra	Piquiatuba	1937	FMNH	FMNH 101507	skin	male enlarged gonads

No.	State	Municipality	Locality	Date	Record Source	No. Collection / Museum/Source	Record type	Sex / Age / Plumage/Nest
83	Pará	Belterra	Piquiatuba	1937	FMNH	FMNH 101506	skin	female enlarged gonads
84	Pará	Belterra	Tapajós FLONA	2003	Henriques <i>et al.</i> 2003	Literature	occurrence	n.a.
85	Pará	Santarém	Tapajós Arapiuns RESEX	2003	Peres <i>et al.</i> 2003	Literature	occurrence	n.a.
86	Pará	Tailândia		2008	Soares <i>et al.</i> 2008	Literature	occurrence	n.a.
87	Pará	Novo Progresso		2012	CETAS IBAMA Guarantã do Norte, MT, without destination	PCGR Database	rescued	young/Pdark
88	Pará		Para State - not on map	historical	Teixeira <i>et al.</i> 2010	Literature	occurrence	n.a.
89	Pará	Tomé Açu	Cauaxi Farm	2004, 2006	Portes <i>et al.</i> 2011	Literature	occurrence	n.a.
90	Pará	Tailândia	Group Agropalma Reserve	1998, 2005	Portes <i>et al.</i> 2011	Literature	occurrence	n.a.
91	Pará	Tailândia	Rio Capim Farm	2005, 2007	Portes <i>et al.</i> 2011	Literature	occurrence	n.a.
92	Pará	Santana do Araguaia	Fartura Farm	2009-2010	Somenzari <i>et al.</i> 2007	Literature	occurrence	n.a.
93	Pará	Tucuruí		2012	Frederico Martins - ICMBio; housed at CRAX	ICMBio - pers. comm.	rescued	young
94	Pará	Paragominas		2010-2011	Lees <i>et al.</i> 2012	Literature	occurrence	n.a.
95	Pará	Brasil Novo	Xingu River left bank	2014	T. M. Sanaïotti, PCGR	Database	visual	adult/Ppale
96	Paraná	Marechal Cândido Rondon	Sete Quedas Museum	1964	Straube & Urben-Filho 2010	Literature	mounted specimen	n.a.
97	Rio de Janeiro	Cantagalo		n.a.	Pinto, 1964: 82-83	Literature		n.a.
98	Rio de Janeiro	Cantagalo		n.a.	Hellmayr & Conover 1949	Literature	skin, Johann Natterer collection	n.a.
99	Rio de Janeiro		Rio de Janeiro Nacional Museum - without precedence	n.a.	MNRJ	MNRJ 889, 8552, 21645, 44312, 44313	5 specimens	n.a.
100	R. G. do Sul	Taquara		1899	Von Ihering 1899	Literature	occurrence	n.a.
101	R. G. do Sul	Santa Cruz do Sul		1920	Bencke 1996	Literature	mounted specimen	Ppale
102	R. G. do Sul	Derrubadas - occurrence suggested	Rio Turvo State Park	1984	Belton 1984	Literature	occurrence	n.a.
103	R. G. do Sul	Foz do Iguaçu	Iguaçu PARNA	1993	Forrester 1993	Literature	occurrence	n.a.
104	R. G. do Sul	Very rare in the State		n.a.	Sick 1997	Literature		n.a.

No.	State	Municipality	Locality	Date	Record Source	No. Collection / Museum/Source	Record type	Sex / Age / Plumage/Nest
105	R. G. do Sul	Probably Extinct in the State		n.a.	Marques <i>et al.</i> 2002	Literature		n.a.
106	Rondônia	Guajará Mirim and Costa Marques	Serra Cutia	2003	Olmos <i>et al.</i> 2011	Literature	visual	1 adult/Ppale
107	Rondônia	Guajará Mirim and Costa Marques	Serra Cutia	2003	Olmos <i>et al.</i> 2011	Literature	visual	2 adult/Ppale
108	Rondônia	Ji-Paraná	Cachoeira Nazaré, Ji-Paraná River	1987-1988	Storz <i>et al.</i> 1997	Literature	occurrence	n.a.
109	Rondônia	Chupinguáia	Boa Esperança Village	25/08/2011	S.O.S. Falconiformes	Pers. comm. and photos	photo	young
110	Rondônia	São Francisco do Guaporé and Alta Floresta D'Oeste	Guaporé REBIO	mar/12	Sandro Alves	Video pers. archive	video	adult/Pdark
111	Rondônia	Chupinguáia	Boa Esperança Village	2010	Kurazo Okada Aguiar	WA 10942	photo	1 adult
112	Rondônia	Chupinguáia	Boa Esperança Village	set/12	S.O.S. Falconiformes	Pers. comm. and photos	photo	pair/nest
113	Rondônia	Chupinguáia	Boa Esperança Village- not on map	2012	Raphael Hipólito	Pers. comm.	photo	1 adult/Ppale
114	Rondônia	Porto Velho	Ramal Rio das Garças	12/09/2011	F. Pereira	WA 674776	photo	1 adult/Ppale
115	Roraima	Caracaráí	Viruá PARNA	2004	Robson Czaban	WA 88548	photo	1 adult/Ppale
116	Roraima	Caracaráí	Jufari River, Caicubí Village	2011	L. F. Silveira	Pers. comm.	visual	adult
117	Roraima	Boas Vista	Maracá ESEC	1985	Moskovits <i>et al.</i> 1985	Literature	occurrence	n.a.
118	Santa Catarina	Siderópolis	Jordão Baixo	1977	Albuquerque 1983	Literature	visual	adult
119	Santa Catarina	Grão Pará	Aiúre	2005	Albuquerque <i>et al.</i> 2006	Literature	visual	2 visual
120	Santa Catarina	Joinville	Frei Miguel Museum	1926	Favretto, 2008	Literature	mounted specimen	adult/Ppale
121	Santa Catarina	Lontras		1965/70	PCGR Database	UFSC 362	mounted specimen	adult/Ppale
122	Santa Catarina	Siderópolis		1997	Rosário 1997	Literature	occurrence	n.a.
123	São Paulo	Jacupiranga, Barra do Turvo, Cananéia, Iporanga, Eldorado and Cajati	Jacupiranga State Park	25/05/1990	Galetti <i>et al.</i> 1997	Literature	visual	1 adult

No.	State	Municipality	Locality	Date	Record Source	No. Collection / Museum/Source	Record type	Sex / Age / Plumage/Nest
124	São Paulo	Jacupiranga, Barra do Turvo, Cananéia, Iporanga, Eldorado and Cajati	Jacupiranga State Park	14/12/1992	Galetti <i>et al.</i> 1997	Literature	visual	1 adult
125	São Paulo	Teodoro Sampaio	Morro do Diabo State Park	14/12/1992	Galetti <i>et al.</i> 1997	Literature	visual	1 adult
126	São Paulo	Ribeirão Grande, Guapiara, Sete Barras, Eldorado and Iporanga	Intervalles State Park	24/02/1995	Galetti <i>et al.</i> 1997	Literature	visual	1 adult
127	São Paulo	Apiáí		1900	MZUSP	MZUSP 2417		n.a.
128	São Paulo	Occurrence in the State - not on map		1898	Ihering 1898	Literature	possible occurrence	n.a.
129	São Paulo		Zooparque Itatiba at Itatiba, without precedence	n.a.	PCGR	PCGR		captive pair
130	São Paulo		Museu de Historia Natural de Taubaté - without precedence	n.a.	MHNT	n.a.	mounted specimen	adult/♀pale

APPENDIX 2

Databases, museums and personal communications of Crested Eagle records from outside Brazil used the following nomenclatures. Museums and Collections accessed with **ORNIS** – Online database of Ornithological Collections: (AMNH) American Museum of Natural History; (ROM) Royal Ontario Museum; (MCZ) Museum of Comparative Zoology; (CM) Carnegie Museum of Natural History; (FMNH) Field Museum of Natural History; (ANSP) Academy of Natural Sciences of Philadelphia; (USNM) United States National Museum; (LSUMZ) Louisiana State University Museum of Natural Science; (MHNIB) Museum of Natural History Itaipu Binacional; (XC) Xeno-canto Online Sound Collection; (MAC) Macaulay Library Collection; and (CEPEPE) Center for Propagation of Endangered Panamanian Species. **Record Type: Occurrence:** general region of occurrence cited in literature, without specific record details, number of sights, number or data on individuals; **Plumage:** Ppale – pale-morph, Pdark – dark-morph plumage, Pextdark – extreme dark-morph.

No.	Country	County	Locality	Year	Citation	Source/ Collection number	Record	Sex/Age/ Plumage/Nest
131	Mexico	Campeche	Calakmul Ruins	1992	Sutter & Diaz in Whitacre <i>et al.</i> 2012	Literature	visual	adult soaring
132	Mexico	Chiapas	Montes Azules Biosphere Reserve	2004	Grosset & Gutierrez-Carbonel 2007	Literature	photo	adult
133	Mexico	Chiapas	Chiapas	n.a.	Whitacre <i>et al.</i> 2012	Literature	occurrence	n.a.
134	Mexico	Quintana Roo	Quintana Roo	n.a.	Whitacre <i>et al.</i> 2012	Literature	occurrence	n.a.
135	Belize	Orange Walk	Chan Chich Lodge	1995	Hall 1995	Literature	occurrence	n.a.
136	Belize	Toledo	Toledo	1995	Howell <i>et al.</i> 2000	Literature	occurrence	n.a.
137	Belize	Cayo	Cayo	1995	Howell <i>et al.</i> 2001	Literature	occurrence	n.a.
138	Belize	Orange Walk	Orange	1995	Howell <i>et al.</i> 2002	Literature	occurrence	n.a.
139	Belize		Southeastern Region	2006	Jones & Komar 2006	Literature	occurrence	n.a.
140	Guatemala	Perén	Flores	1981	Ellis & Whaley 1981	Literature	occurrence	n.a.
141	Guatemala	Perén	Tikal National Park	1994	Whitacre <i>et al.</i> 2012	Literature		nest
142	Guatemala	Perén	Tikal National Park	1995	Whitacre <i>et al.</i> 2012	Literature		nest
143	Guatemala	Perén	Tikal National Park	2006	Grijalva & Eisermann 2006	Literature		young
144	Guatemala		Atlantic Region	2006	Eisermann & Avendaño 2007	Literature		n.a.
145	Guatemala	Perén	Flores	1978	ORNIS	AMNH812849	skin	n.a.
146	Guatemala	Perén	Flores	1966	ORNIS	ROM115862	complete skeleton + partial skin	n.a.
147	Honduras	La Ceiba	La Ceiba	1903	Bangs 1903	Literature	collected	young
148	Honduras	San Pedro Sula	San Pedro Sula	1968	Monroe 1968	Literature	occurrence	n.a.

No.	Country	County	Locality	Year	Citation	Source/ Collection number	Record	Sex/Age/ Plumage/Nest
149	Honduras		Quebrada Kahkatingni - near Patuca River	1999	Russell Thorstrom in GRIN 2013	Literature	occurrence	young
150	Honduras		Occurrence in Honduras	2002	Bonta & Anderson 2002	Literature	occurrence	n.a.
151	Honduras	La Ceiba	La Ceiba	1902	ORNIS	MCZ110535	skin	n.a.
152	Nicaragua	Jinotega	Hormigero Community, Cerro Sasiaya, at Bosawas Biosphere Reserve	2001	GRIN 2013	Literature	occurrence	n.a.
153	Nicaragua	San Juan del Nicaragua	Bartola Reserve	1994	Múnera-Roldán <i>et al.</i> 2007	Literature	occurrence	adult
154	Nicaragua	San Juan del Nicaragua	Bartola Reserve	1999	Múnera-Roldán <i>et al.</i> 2007	Literature	occurrence	adult
155	Nicaragua	Prinzapolka, Zelaya	Alamikangban Community	2005	Kjeldsen 2005	Literature	occurrence	adult
156	Costa Rica	Heredia	La Selva Biological Station, Sarapiquí region	1989	Stiles & Skutch 1989	Literature	occurrence	n.a.
157	Costa Rica	Sirena	Sirena Biological Station, Corcovado National Park, Osa Peninsula	1989	Stiles & Skutch 1989	Literature	occurrence	n.a.
158	Costa Rica	Límon	Cuabre - Sixaola River	1910	Carrier 1910	Literature	occurrence	n.a.
159	Costa Rica	Puntarenas	Cerro Cañas Gordas	1964	Slud 1964	Literature	occurrence	n.a.
160	Costa Rica	San Jose Limon	La Finca Selva - Braulio Carrillo National Park	2004	Jones 2004	Literature	occurrence	n.a.
161	Costa Rica	San Jose Limon	Rara Avis Jungle Lodge -Braulio Carrillo National Park	2004	Jones 2004	Literature	occurrence	n.a.
162	Costa Rica	Límon	Tortuguero	2006	Jones & Komar 2006	Literature	occurrence	n.a.
163	Costa Rica	Límon	Tortuguero	2005	G. Ocklind	Pers. comm.	photo	pair
164	Costa Rica	Límon	Tortuguero National Park	2013	Carlos Calvo Obando photo/ Fundación Rapaces de Costa Rica, P Camacho Varela pers. comm.	PCGR Database	photo	adult/ Ppale
165	Costa Rica	Límon	Caño Harold - Tortuguero National Park	2014	Ron Osborne photo/ Fundación Rapaces de Costa Rica, P Camacho Varela pers. comm.	PCGR Database	photo	adult/ Ppale
166	Costa Rica	Alajuela	Crucitas - Cuttris de San Carlos	2011	Rodolfo Vargas Leiton photo/ Fundación Rapaces de Costa Rica, P Camacho Varela pers. comm.	PCGR Database	photo	adult/ Pdark
167	Costa Rica	Límon	Cuabre	1904	ORNIS	CMP23989	skin	n.a.
168	Panama		Caribbean slopes, Southeast and East Panamá	1965	Wermore 1965	Literature	occurrence	n.a.

No.	Country	County	Locality	Year	Citation	Source/ Collection number	Record	Sex/Age/ Plumage/Nest
169	Panama	Los Santos	Azuero Peninsula	1989	Ridgely & Gwynne 1989	Literature	occurrence	n.a.
170	Panama	Los Santos/Mariato	Cerro Hoya National Park	1989	Ridgely & Gwynne 1989	Literature	occurrence	n.a.
171	Panama	Panamá Province	region	1989	Ridgely & Gwynne 1989	Literature	occurrence	n.a.
172	Panama	Chiriquí Province	region	1989	Ridgely & Gwynne 1989	Literature	unsubstantiated occurrence	n.a.
173	Panama	Veraguás	Coiba Island, Gulf of Chiriquí	1989	Ridgely & Gwynne 1989	Literature	unsubstantiated occurrence	n.a.
174	Panama	Panamá Canal	Barro Colorado Island	1989	Ridgely & Gwynne 1989	Literature	occurrence	n.a.
175	Panama	Chiriquí	Boquete	1989	Ridgely & Gwynne 1989	Literature	occurrence	n.a.
176	Panama		Panamá Canal Zone	1989	Ridgely & Gwynne 1989	Literature	occurrence	n.a.
177	Panama	Guna Yala	Chiquita River region, Central Panamá	1989	Kiff <i>et al.</i> 1989	Literature	egg laying by CEPEPE captive	n.a.
178	Panama	Dárien	Quintín Community	2006	Vargas <i>et al.</i> 2006	Literature	interspecific interaction	n.a.
179	Panama	Cólon	San Lorenzo National Park	2007	Jones & Komar 2007	Literature		young
180	Panama	Dárien	Cana Camp - Darién National Park	2010	E. Groenewoud	IBC	photo	adult/Ppale
181	Panama	Dárien	Rancho Frio Camp - Darién National Park	2013	A. Spencer	XC127521	vocalization near nest	nest
182	Panama	Gamboa	Canal Zone	1981	Van den Berg, A. B.	Mac28459	vocalization	female/Pdark
183	Panama		Changuinola	1928	ORNIS	MCZ137642	skin	n.a.
184	Panama	Dárien	Perme	1929	ORNIS	MCZ155152	skin	female
185	Panama	N.i.	Banana River	1928	ORNIS	MCZ137127	skin	female
186	Panama	Kuna Yala	“Puerto” Obaldia	1930	ORNIS	MCZ156514	skin	male
187	Panama	Kuna Yala	San Blas - Port Obaldia	1935	ORNIS	FMNH100685	male of pair	male
188	Panama	Kuna Yala	San Blas - Port Obaldia	1935	ORNIS	FMNH100729	female of pair	female
189	Panama	Panamá Canal	Barro Colorado Island	1936	ORNIS	AMNH300600	skin	n.a.
190	Panama	Dárien	Tapalisa, eastern of Panamá - Tapalisa River	1915	ORNIS	AMNH135352	skin	n.a.
191	Panama	Dárien	Tapalisa, eastern of Panamá - Tapalisa River	1915	ORNIS	AMNH135353	skin	n.a.
192	Colombia	Chocó	Region	1986	Hilty & Brown 1986	Literature	occurrence	n.a.

No.	Country	County	Locality	Year	Citation	Source/ Collection number	Record	Sex/Age/ Plumage/Nest
193	Colombia	Chocó	Baudó Mountains	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
194	Colombia	Valle del Cauca	Achicaya River Valley (Anchicaya)	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
195	Colombia	Cordova	Sinú River Valley	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
196	Colombia	Cordova	Cordova	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
197	Colombia	Zúlia	Perijá Moutains	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
198	Colombia	La Guajira	Carraipa	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
199	Colombia		East of Andes region	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
200	Colombia	Meta	Vilavencio region	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
201	Colombia	Caquetá	Caquetá	1986	Hilty & Brown 1986	Literature	occurrence	n.a.
202	Colombia	Amazonas	Leticia	1972	Márquez <i>et al.</i> 2005	Literature	Museum, no data	n.a.
203	Colombia	Caquetá	Belén	1941	Márquez <i>et al.</i> 2005	Literature	Museum, no data	n.a.
204	Colombia	Chocó	Salaqui River	1940	Márquez <i>et al.</i> 2005	Literature	Museum, no data	n.a.
205	Colombia	Chocó	Juradó River	1940	Márquez <i>et al.</i> 2005	Literature	Museum, no data	n.a.
206	Colombia	Caquetá	Morélia region	n.a.	ORNIS	ANSP153087	skin	n.a.
207	Colombia	Chocó	Truandó River (Truanto)	n.a.	ORNIS	USNM17781	Complete specimen in alcohol	n.a.
208	Colombia	Cordova	Sinú River	1949	ORNIS	USNM410536	Complete specimen in alcohol	n.a.
209	Colombia	Chocó	Acandi, Gulf of Uraba	1949	ORNIS	USNM425433	Complete specimen in alcohol	n.a.
210	Colombia	Chocó	Jampavado River	1940	ORNIS	FMNH102242	skin	n.a.
211	Colombia	Chocó	Juradó River	1940	ORNIS	FMNH102243	skin	n.a.
212	Colombia	Antioquia	Cuturu	1947	ORNIS	FMNH190728	skin	female
213	Ecuador	Pichincha	Pichincha region	2001	Ridgely & Greenfield 2001	Literature	recorded	n.a.
214	Ecuador		Base of Andes region	2001	Ridgely & Greenfield 2001	Literature	occurrence	n.a.
215	Ecuador	Esmeraldas	Esmeraldas	2007	Muniz-Lopes <i>et al.</i> 2007	Literature	occurrence	n.a.

No.	Country	County	Locality	Year	Citation	Source/ Collection number	Record	Sex/Age/ Plumage/Nest
216	Ecuador	Sucumbios	Cuyabeno Wildlife Reserve	2007	Libor Váincenbacher	Photo IBC	snake predation	Ppale
217	Ecuador	Sucumbios	Cuyabeno Wildlife Reserve	2014	R. Munitz-Lopes - PCAHE	pers. comm	visual	adult/chick/ nest
218	Ecuador	Napo	Napo Wildlife Center	2008	T. Cloudman	list of species	adult	Pdark
219	Ecuador	Not reported	Quito Zoo at Guayllabamba	2011	Montalvo & Montalvo 2011	Literature	captive	adult female/ Ppale
220	Bolivia	Beni	Beni	1994	M. Pearman 1994 in GRIN 2013	Literature	occurrence	n.a.
221	Bolivia	Beni	Noel Kempff National Park	1998	Bates <i>et al.</i> 1998	Literature	occurrence	n.a.
222	Bolivia	La Paz	La Paz	2003	Hennessey <i>et al.</i> 2003	Literature	occurrence	n.a.
223	Bolivia	Santa Cruz	Santa Cruz	2003	Hennessey <i>et al.</i> 2003	Literature	occurrence	n.a.
224	Bolivia	Mérida	Caparú Biological Station	2005	Vidoz <i>et al.</i> 2010	Literature	occurrence	n.a.
225	Peru		Gallery forest, Eastern region of Andes	n.a.	Clements & Shany 2001	Literature	occurrence	n.a.
226	Peru	Amazonas Departmet	Donated to Oklahoma City Zoo	1978	Kiff <i>et al.</i> 1989	Literature	female collected	female/nest
227	Peru	Madre de Dios	Reserva Tambopata - Candamo	1994	Parker III <i>et al.</i> 1994	Literature	occurrence	n.a.
228	Peru	Madre de Dios	Reserva Tambopata - Candamo	2007	Raine 2007	Literature		nest
229	Peru	Madre de Dios	Amazon Manu Lodge	1977	R. Fabbri, pers. arch.	Photo personal archive		adults/chick/ nest
230	Peru	Madre de Dios	Amazon Manu Lodge	2006	R. Fabbri, pers. arch.	Photo personal archive		adults/chick/ nest
231	Peru	Cuzco	Quebrada Blanco Biological Station	2001	Vazquez & Heymann 2001	Literature	predation on monkeys	n.a.
232	Peru	Ucayali	Pacaya municipally	2012	A. Morales	Photo personal archive		young
233	Peru	Not reported	Centro de Reproducion Huayco at Lima	2013	J. A. Otero	pers. comm.	captive	6 individuals
234	Peru	Iquitos	Peru Lodge, Tahuayo River	2013	Peru Lodge	list of species	occurrence	n.a.
235	Peru	Amazonas	Departamento do Amazonas	n.a.	ORNIS	LSUMZ84285	skin	n.a.
236	Peru	Loreto	Departamento de Loreto	n.a.	ORNIS	LSUMZ114339	complete in alcohol	n.a.
237	Peru	Loreto	Departamento de Loreto	n.a.	ORNIS	LSUMZ114589	complete in alcohol	n.a.

No.	Country	County	Locality	Year	Citation	Source/ Collection number	Record	Sex/Age/ Plumage/Nest
238	Peru	Loreto	Departamento de Loreto	n.a.	ORNIS	LSUMZ118952	feathers	n.a.
239	Venezuela		North of Orinoco River	2003	Hilty 2003	Literature	occurrence	n.a.
240	Venezuela		Caura River	2003	Hilty 2003	Literature	occurrence	n.a.
241	Venezuela		Maracaibo Basin	2003	Hilty 2003	Literature	occurrence	n.a.
242	Venezuela		Sierra Perijá	2003	Hilty 2003	Literature	occurrence	n.a.
243	Venezuela		Zulia	2003	Hilty 2003	Literature	occurrence	n.a.
244	Venezuela	Merida	Andes	2003	Hilty 2003	Literature	occurrence	n.a.
245	Venezuela		Lara	2003	Hilty 2003	Literature	occurrence	n.a.
246	Venezuela	Amazonas	Amazonas Province	2003	Hilty 2003	Literature	occurrence	n.a.
247	Venezuela		Bolivar	2003	Hilty 2003	Literature	occurrence	n.a.
248	Venezuela	Margarita	Margarita Island	2003	Hilty 2003	Literature	occurrence	n.a.
249	Venezuela	Barinas	Obispos municipality	2006	Uzcátegui <i>et al.</i> 2010	Literature	occurrence	n.a.
250	Venezuela	Bolivar	Gran Sabana region	2011	Crease & Tepedino 2013	Literature	nest	n.a.
251	Guyana		Lowland forest environments	n.a.	Braun <i>et al.</i> 2000	Literature	occurrence	n.a.
252	Guyana	Rupununi	Chief Rewa Reserve (head)	2011	Pickles <i>et al.</i> 2011	Literature	occurrence	n.a.
253	Guyana	Rupununi	Upper Takatu - Upper Essequibos	1964	ORNIS	ROM94735	skin	n.a.
254	Guyana	Rupununi	Upper Takatu - Upper Essequibos	1964	ORNIS	ROM94725	skin	n.a.
255	Guyana	Bartica	Kalacoon (Kalakun)	n.a.	ORNIS	AMNH804578	skin	n.a.
256	French Guyana		Forest areas, General occurrence	n.a.	Thiollay 2007	Literature		n.a.
257	French Guyana	Cayenne	Nouragues Field Station	1992	Julliot 1994	Literature	predation on monkey	n.a.
258	French Guyana	Cayenne	Approuague River, Regina municipality	2011	Johann Tascon	Literature		adult/Pextdark
259	French Guyana	Non reported	Guyana Zoo, in Macouria	n.a.	Maxcobigo	IBC	photo	male/Pdark
260	Surinam		Forest areas, General occurrence	n.a.	Haverschmidt & Mees 1994	Literature	occurrence	n.a.
261	Surinam	Sipaliwini District	Raleigh Falls-Voltz Bergue Nature Reserve	1987	Trail 1987	Literature	predation on <i>Rupicola rupicola</i>	n.a.

No.	Country	County	Locality	Year	Citation	Source/ Collection number	Record	Sex/Age/ Plumage/Nest
262	Argentina		Resident in the country, General occurrence	n.a.	Mazar-Barnett & Pearman 2001	Literature		n.a.
263	Argentina	Misiones	El Piñalito Provincial Park	2001	Pearman 2001	Literature		adult
264	Argentina	Santa Ana	Santa Ana	1913	Bertoni 1913	Literature	occurrence	n.a.
265	Argentina	Misiones	Iguazú National Park	1980	Rumboll & Straneck (In Olrog, 1985)	Literature	pair in display	n.a.
266	Paraguay		Alto Paraná region	2004	Del Castillo & Clay 2004	Literature	occurrence	n.a.
267	Paraguay	Itapúa	San Rafael Nacional Park	1997	Madroño 1997	Literature	pair displaying	n.a.
268	Paraguay	Itapúa	San Rafael Nacional Park	1997	Madroño 1997	Literature		adult
269	Paraguay	Itapúa	San Rafael Nacional Park - collected and donated to Zoo	died 2002	Del Castillo & Clay 2004	MHNIB872	adult captured, housed in Museum	adult
270	Paraguay	Itapúa	Colônia Aurora, Region of San Rafael Nacional Park	2003	N. Lopes <i>in</i> Del Castillo & Clay 2004	Literature		adult flying