Field Identification of the SOLITARY EAGLE

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The Solitary Eagle (*Harpyhaliaetus solitarius*) is a large raptor that is closely related and similar in adult and immature plumages to the black-hawks in the genus *Buteogallus* (Lerner and Mindell 2005). It is a rare and very local resident in a variety of wet and dry forested hills and highlands from northern Argentina to northern Mexico (del Hoyo et al. 1994, Ferguson-Lees and Christie 2001). The species has been collected in Mexico not far from the Texas border (see Discussion, pp. 72–73), so it is possible that it has occurred in the ABA Area. The handful of specimens and nest records of this eagle are from 700 to 2,000 meters above sea level (Brown and Amadon 1968). Nevertheless, sightings of this eagle are occasionally reported from lowland tropical rain forest, e.g., at Tikal, Guatemala (Beaver et al. 1991) and the Tuxtlas Mountains of southern Veracruz, Mexico (Winker et al. 1992). The species has been reported on some professional bird tours at such lowland sites as Palenque and the Usumicinta River in southern Mexico. All of these accounts have relied on large size and gray coloration as the field marks to distinguish the eagles from the much more abundant Common Black-Hawk (*Buteogallus anthracinus*) and Great Black-Hawk (*B. urubitinga*).

Howell and Webb (1995) were skeptical and stated that most lowland records of the eagle likely pertain to of one of the black-hawks. We agree. The problem is that the eagle is very similar in plumage to the black-hawks, and is rare and local and not regularly seen. Further, there is no published set of reliable field marks to distinguish Solitary Eagle with certainty under most field conditions and few published photographs to use for comparison. Observers have not had the means to distinguish the eagle from the black-hawks—especially the Common Black-Hawk—with certainty.

We examined some recent photographs of adult Solitary Eagles in flight and perched, along with a short video of an adult in flight in Peru, available online <prba.com/SolitaryEagle.wmv>. Based on these images, comparison photos of black-hawks, and specimen information, we present a set of field marks that will serve to confidently identify Solitary Eagles seen well. These include differences between flying eagles and black-hawks in wing shape, underwing pattern, position of feet relative to the tip and band on the undertail of adults, shape of the corners and apparent length of the tail, and vocalizations of flying adults. Further clues are their relative sizes; King Vulture and Solitary Eagle appear the same size in flight; the black-hawks appear about

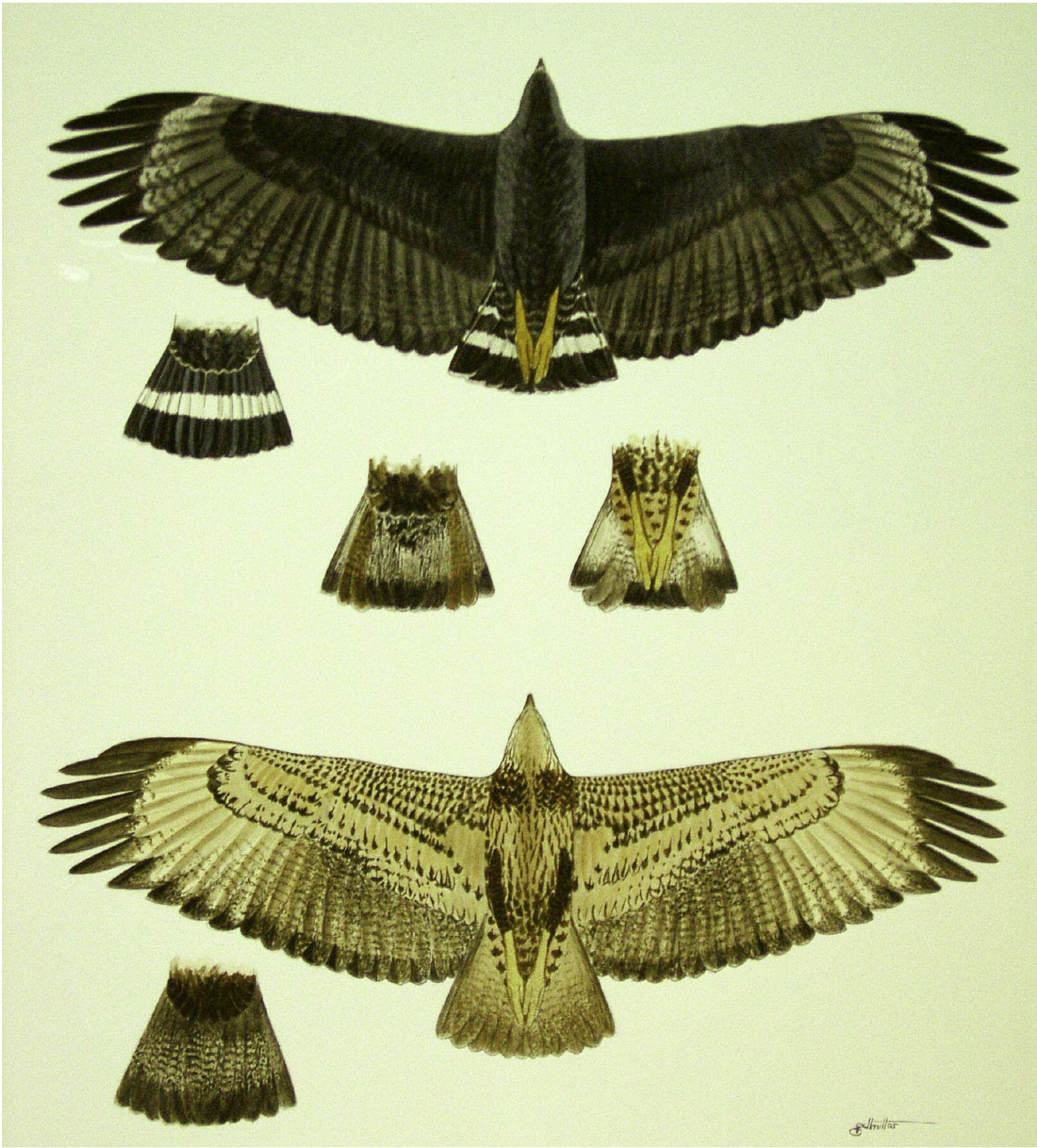

Fig. 1. Adult and juvenile **Solitary Eagles** in flight. *Painting by © N. John Schmitt.*

Fig. 2. Adult **Solitary Eagle** in flight. *Mountain Pine Ridge, Belize; November 2004. © Charles Anderson.*

Fig. 3. Adult **Solitary Eagle** in flight. *Mountain Pine Ridge, Belize; November 2005. © Paul Kaplan.*

the same size as Black Vulture. Field marks for distinguishing perched individuals are color differences of the bill, cere, and lores, plus the position of the wingtips and secondaries relative to the tail tip. Habitat and elevation, wing beat frequency, and rotation time in thermals are suggestive but not diagnostic. We feel that the apparent large size of an eagle flying by itself, the wingtip formula reported in Howell and Webb (1995), and, in northern South America, Central America, and Mexico, the overall color (gray vs. black) are not by themselves valid field marks.

Differences Between Adult Solitary Eagle and Common Black-Hawk

Adult Solitary Eagles in southern South America are pale gray overall and are rather easy to distinguish from the darker grayish-black Common Black-Hawk, but this point is academic, as the two species are usually not found in the same areas there. However, Solitary Eagles in Mexico, Central America, and northern South America are of another race, *sheffleri* (called Black Solitary Eagle), and are nearly the same color as the black-hawks (Figs. 1–5, 7–9)—overall blackish with a grayish cast (van Rossem 1948). This pattern is analogous to the color differences, reported by del Hoyo et al. (1994), between Crane Hawk in South America (gray) and in Central America and Mexico (black). As the ranges of the eagle and black-hawks overlap in hilly and mountainous areas of Mexico and Central and northern South America (Hilty

Fig. 4. Adult **Common Black-Hawk** in flight. *Southeast Arizona; July 1992. © William S. Clark.*

and Brown 1986, Howell and Webb 1995, Hilty 2003), observers must take care in distinguishing them. The following field marks will separate adults of both species.

- Solitary Eagle has a gradually widening, nearly straight trailing edge of the wings, with primaries narrower than secondaries and an abrupt narrowing near the body (Figs. 1–3). In contrast, the Common Black-Hawk's trailing edge is more rounded, with the primaries almost as wide as secondaries and the widest part of the wings farther from the body (Fig 4).
- Solitary Eagle shows a crescent-shaped pale area that extends across the middle of the primaries, emphasizing its black tips (Figs. 1–3, 5). Some also show a small white patch at the base of the outer primaries, like that of adult Common Black-Hawk, whereas Common Black-Hawk shows only the smaller, more obvious white mark at the base of the outer three primaries (Fig. 4).
- The secondaries of Solitary Eagle appear uniformly dark, with the darker tips visible only in strong light (Figs. 1–3); Common Black-Hawk's secondaries are paler, often with a rufous wash, and with a wide dark terminal band (Fig. 4).
- The tail of Solitary Eagle barely projects beyond the trailing edge of the wings, because of its long secondaries (Figs. 1–3); conversely, Common Black-Hawk's tail projects noticeably beyond the wings, as its secondaries are relatively shorter (Fig. 4). However, the fully-fanned tails of both appear shorter.
- The corners of the tail of Solitary Eagle are square, as the outer tail feathers are the same length as the others (Figs. 1–3), but the corners of the tail appear somewhat rounded on Common Black-Hawk, as the outer tail feathers are somewhat shorter than the others (Fig. 4).
- The feet and legs of Solitary Eagle are proportionally longer and larger than those of the Common Black-Hawk, such that the feet extend beyond the white tail band on the undertail almost to the tip

Fig. 5. Specimens of adult **Solitary Eagle** (left) and adult **Common Black-Hawk** (right) from Central America, showing identical coloration. Note the black tips and paler mottled area in the center of the eagle's outer primaries. *Delaware Museum of Natural History. © William S. Clark.*

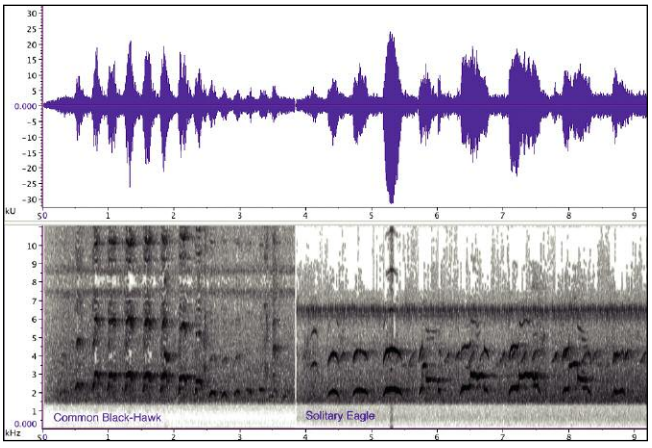

Fig. 6. Sonograms of **Common Black-Hawk** (left) and **Solitary Eagle** (right). *Figure by © John Arvin.*

Fig. 7. Adult **Common Black-Hawk.** *Panama; October 2003. © William S. Clark.*

(Figs. 1–3). Those of Common Black-Hawk reach or barely extend beyond the white tail band (Fig. 4).

- Vocalizations of displaying adults are different. Flight calls of Common Black-Hawks are a series of strident, piping *wheep* notes, whereas those of Solitary Eagle begin with a slower, emphatic, rising series of *wheeeo* notes, switching to more-modulated, higher-pitched, shrill elements, consisting primarily of three-parted *wha-eeeee-ah* notes (Fig. 6). Furthermore, Solitary Eagle continues to soar and call for longer periods, up to a half-hour or even longer, whereas Common Black-Hawk usually soars and calls for shorter periods, from two to ten minutes.
- If the raptor in question is flying with other raptors of known size, then relative size is a field mark, with Solitary Eagle appearing similar in size to King Vulture, and Common Black-Hawk about the size of the Black Vulture.
- Solitary Eagle takes longer to make a complete circle in a thermal because of its large size; its wing beats in powered flight are also slower, again due to its larger size.

Fig. 8. Adult **Solitary Eagle.** *Bolivia; April 1977. © Robert S. Ridgely.*

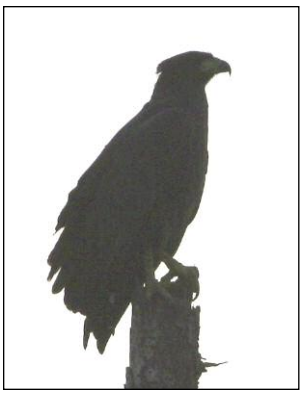

Fig. 9. Adult **Solitary Eagle.** *Mountain Pine Ridge, Belize; November 2005. © Chris D. Benesh.*

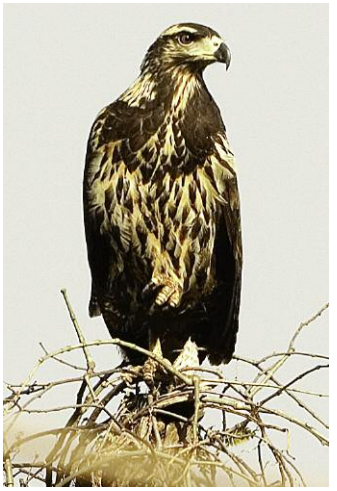

Fig. 10. Immature **Solitary Eagle.** *Tamaulipas, Mexico; February 2006. © Rick Cech.*

Perched, the two species can also be difficult to distinguish. The following field marks will separate adults of both species:

- The cere and lores are bright orange on Common Black-Hawk, with the orange color bleeding onto the base of the bill (Fig. 7), whereas on Solitary Eagle, the cere is yellow, the lores are pale grayish, and the beak is all black (Fig. 8).
- The wingtips of Solitary Eagle extend beyond the tail tip (Figs. 8, 9), whereas those of Common Black-Hawk just reach or fall just short of the tail tip (Fig. 7). Note the short crest of the eagle in Fig. 9.
- The secondaries of Solitary Eagle extend almost to the tail tip (Fig. 9), whereas those of Common Black-Hawk reach just to the tail band (Fig. 7).

Although Solitary Eagle is much larger, this fact is of limited use under most field conditions. As one can see from Fig. 5, although the eagle is more grayish, the overall colors of the adults of Solitary Eagle and Common Black-Hawk in Mexico, Central America, and northern South America are too close for confident identification. Many adult Common Black-Hawks show a strong grayish wash overall (see Fig. 7), visible even on some museum specimens. We found that the wing tip formula is almost the same for the two species (Figs. 1–4) and thus, contra Howell and Webb (1995), is not a useful field mark. We believe that the illustration of the eagle in Howell and Webb (1995) shows P10 too long.

Differences Between Immature Solitary Eagle and Juvenile Common Black-Hawk

Immature Solitary Eagle can be distinguished from juvenile Common Black-Hawk by the following field marks:

- The solidly dark leg feathers of the immature Solitary Eagle lack noticeable banding (Figs. 1, 10). Juvenile Common Black-Hawk shows narrow dark banding on its white leg feathers (Fig. 11).

Fig. 11. Juvenile **Common Black-Hawk.** *Veracruz, Mexico; October 2004. © William S. Clark.*

- The pale tail of the immature Solitary Eagle lacks noticeable banding (Fig. 1). Juvenile Common Black-Hawk always shows narrow dark banding on its white tail (Fig. 11). Older immature eagles show a wide dark subterminal band on a brownish, otherwise unbanded tail (Fig. 1).
- The immature Solitary Eagle has heavy dark markings on its breast (Figs. 1, 10); juvenile Common Black-Hawk shows only dark streaks on the sides of the upper breast (Fig. 11).
- The bill of Solitary Eagle is completely dark (Fig. 10), whereas that of juvenile Common Black-Hawk has a pale base.

Fig. 12. Adult **Great Black-Hawk.** *Veracruz, Mexico; October 2004. © William S. Clark.*

Differences Between Adult Solitary Eagle and Adult Great Black-Hawk

The adult Great Black-Hawk is relatively easy to identify, as it shows white uppertail coverts. Furthermore, in flight it shows a proportionally longer tail that extends farther beyond its wings compared to that of the eagle (Fig. 12). The adult of the nominate race in South America and eastern Panama differs in having a wide white base to its tail instead of a white tail band. Its wing shape is similar to but much narrower than that of the adult Solitary Eagle, making its tail appear even longer. The perched Great Black-Hawk shows proportionally longer legs and narrow white barring on its leg feathers. Beak and cere colors are nearly the same on both.

Differences Between Immature Solitary Eagle and Immature Great Black-Hawk

The immature Solitary Eagle at all ages has dark leg feathers, an unbanded tail, and dark markings on the breast (Figs. 1, 10). The juvenile Great Black-Hawk also has an unbanded tail but has pale leg feathers and lacks extensive dark markings on its breast. Basic II Great Black-Hawk has a banded tail; some can show darker leg feathers, but all lack dark breast markings. A Basic II Great Black-Hawk was identified and reported as an immature Solitary Eagle in a recent issue of *North American Birds* (Jones 2004); unpublished photographs of it in flight showed clearly a relatively long, banded tail. Note: We follow the plumage terminology of Howell et al. (2003); their Basic II is the same as Basic I in Humphrey and Parkes (1959).

Discussion

CB identified the eagle in Fig. 2 in Belize while leading a birding tour and asked one of his participants to take photographs of it. At the time he was rather certain that it was a Solitary Eagle, but only by examination of the photographs of it was its identification confirmed.

The problem in identifying Solitary Eagles is that none of the field guides for the countries where it occurs correctly shows the wing shape, tail length, underwing pattern, and position of the feet of flying eagles (Meyer de Schaunsee and Phelps 1978, Hilty and Brown 1986, Fjeldså and Krabbe 1990, Howell and Webb 1995, Ridgely and Greenfield 2001, Hilty 2003, and Jones 2003). Additional problematic treatment in field guides is as follows:

- Stiles and Skutch (1989) show the wing shape

Taxonomy In a recent paper based on mitochondrial and nuclear DNA sequences, Lerner and Mindell (2005) reported that the Solitary Eagle is more closely related to the Great Black-Hawk than is the Common Black-Hawk. Thus, the eagle is just an overgrown black-hawk and should be included in the genus *Buteogallus*. If that's the case, what do we call it now? We think that it should continue to be named Solitary Eagle.

almost correctly, but also show the same wing shape for adult Common Black-Hawk; the in-flight illustrations are from above, so that the underwing patterns and feet positions are not visible.
- Peterson and Chalif (1973) show the longer legs and feet and square tail corners of Solitary Eagle compared to the Common Black-Hawk but do not show the tail length, wing shape, or underwing pattern correctly.
- Solitary Eagle is not illustrated in Ridgely and Gwynne (1989).
- Likewise, neither Land (1970) nor any of the above field guides show the position of the wingtips and the secondaries correctly on perched eagles.
- Brown and Amadon (1968) illustrate only perched birds and depict the plumages of adults and juveniles correctly, but not the position of the wingtips and secondaries.
- The perched adults in Edwards (1972) and del Hoyo et al. (1994) and the perched adult and juvenile in Ferguson-Lees and Christie (2001) show correct plumages and position of wingtips and secondaries.
- The adult in flight in Ferguson-Lees and Christie (2001) correctly shows the feet exceeding the white tail band, but the wing shape and width and underwing pattern are not correct.

A sonogram of the eagle (Fig. 6) was made from a recording made by John Arvin and came from Schulenberg (2000). The Solitary Eagle vocalization on Boesman (1999) sounds exactly like the calls and recorded vocalizations of Great Black-Hawk; P. Boesman (personal communication) agrees that his call is a Great Black-Hawk and states that he based his identification of his "eagle" call on an identically sounding call that was labeled Solitary Eagle on the CD by Mayer (2000).

Interestingly, an adult Solitary Eagle specimen in the Museo de las Aves in Saltillo, Coahuila, Mexico, was collected in December 1979 in the Sierra de Burro in the northern part of that state, not far from the Rio Grande. It is not unlikely that an individual or several of this species have flown across the river into the United States.

We have used the field marks presented herein to re-evaluate two sightings of Solitary Eagle in Belize reported by Jones et al. (2000) and found that both sightings were confirmed, despite some contrary field marks reported. We likewise concur, based on our analysis of their field notes, with the sighting by Ghislain Romprè and others of a pair of adult Solitary Eagles in central Panama. They were in tropical rain forest in a hilly area at 300–500 meters.

We believe that the Solitary Eagle is rare and local, and requires hilly or mountainous topography, more so than elevation itself. Thus, it can be found at low elevations in tropical forest, as long as there are hills present. However, immatures and non-breeding adults necessarily have to travel over relatively flat lowlands between the local breeding areas, so they could be encountered anywhere, but rarely so.

Herein we have presented for the first time a set of objective field marks for correctly identifying Solitary Eagles in the field, both perched and in flight. No field guide or handbook published to date has shown the correct wing shape and other field marks of this eagle in such a way as to allow observers to distinguish it from the much commoner and smaller, but similarly plumaged, Common and Great Black-Hawks.

We urge the re-evaluation of all previous sightings of Solitary Eagles, especially those at lower elevations, using the field marks presented herein for confirmation. We would appreciate receiving photographs or information about sightings or specimens of Solitary Eagles, especially from Mexico and Central America.

Acknowledgments

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