

## Discovery of White-winged Potoo *Nyctibius leucopterus* in Espírito Santo, Brazil, with remarks on its distribution and conservation in the Atlantic Forest

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**SUMMARY.**—White-winged Potoo *Nyctibius leucopterus* is known from very few localities in the Atlantic Forest, but is supposed to occur throughout suitable habitats in Amazonia. Known solely from specimens until the late 1980s, there are still very few data on its natural history and distribution. Here we report a striking new record of *N. leucopterus* in the Atlantic Forest, at Sooretama Biological Reserve, Espírito Santo, the fourth locality in this biome, the first for south-east Brazil and the southernmost ever. Sooretama, together with the adjacent Linhares Natural Reserve, is the largest fragment of lowland Atlantic Forest. Knowledge of its vocal repertoire and habitat preferences evidently enhance our ability to locate the species, and nutrient-poor, sandier soils are apparently critical to its occurrence in the Atlantic Forest. Should the Amazonian population be described as a separate taxon, as has been suggested in the literature, the Atlantic Forest form will be restricted to fragments in Bahia and Espírito Santo, and thus highly threatened.

White-winged Potoo *Nyctibius leucopterus* is one of the most enigmatic and poorly known of all Neotropical birds. It was described by Maximilian A. Philipp, Prince Wied-Neuwied (Wied 1821) from a female collected near Vitória da Conquista, southern Bahia, Brazil. Until recently, the species was known solely from the holotype and another unsexed specimen with no specific locality data (Cohn-Haft 1993, Cleere 1998, Whitney *et al.* 2003). Two additional historical specimens have recently come to light, supposedly collected in Bahia but without a precise locality (Cleere 2005). Four other old specimens attributed to this species, including a syntype listed by Greenway (1978) and collected in Bahia by Wied, have been re-identified as Common Potoo *N. griseus* (Cohn-Haft 1993, Cleere 2005).

Following its description, *N. leucopterus* went unrecorded for almost two centuries, until the late 1980s, when Cohn-Haft (1993) discovered it north of Manaus, in Amazonian Brazil, c.2,500 km from the type locality in the Atlantic Forest. Cohn-Haft (1993) suggested that the Amazonian population may represent an undescribed taxon, based on its notably smaller body size. In addition, he presented much information on behaviour, diet and voice (Cohn-Haft 1993, 1999). Following this, and with knowledge of its voice, *N. leucopterus* has been found at many localities in Amazonian Brazil, as well as in Peru, Guyana, Surinam and French Guiana (Peres & Whittaker 1991, Parker *et al.* 1993, Borges *et al.* 2002, Alvarez & Whitney 2003, Claessens *et al.* 2005, Whittaker *et al.* 2008), and is presumed to be widespread in *terra firme* forest. In contrast, the Atlantic Forest population remained unknown in life until, in 1999, Whitney *et al.* (2003) rediscovered the topotypical population of *N. leucopterus*, c.200 km from the type locality, at Una Biological Reserve in southern coastal Bahia. Its voice proved quite similar to Amazonian birds. More recently, *N. leucopterus* was found at the privately owned Estação Veracel, also in Bahia and c.100 km south of Una (Carvalho *et al.* 2009). These localities appear to be the only sites in the Atlantic Forest.

Here we report the discovery of *N. leucopterus* in Espírito Santo state, Brazil, the first record for south-east Brazil, the fourth locality for the species in the Atlantic Forest and a range extension of *c.*320 km south.

### Study site and Methods

On 4 July 2009, during field work at Sooretama Biological Reserve (hereafter Sooretama), in eastern Espírito Santo (19°03'S, 40°08'W; Figs. 1–2), one of our aims was to search for *N. leucopterus*. Sooretama comprises *c.*24,000 ha of lowland Atlantic Forest, and with the adjacent 21,800-ha Linhares Natural Reserve, owned by the Companhia Vale, forms one of the largest remnants of tropical forest in lowland eastern Brazil (Parker & Goerck 1997), and the largest fragment north of Rio de Janeiro state. It consists of a diverse lowland forest, known as *Floresta de Tabuleiro* (Rizzini 1987, Peixoto & Gentry 1990), associated with sandy soils originated from Tertiary deposits that are deep, acidic and of low fertility (IBDF 1982). Comprising many different formations, in most areas tall forests grow on drier soil with the canopy reaching 40 m, a second arboreal layer and a relatively sparse understorey, and *mussumunga* forest, which consists of lower stature trees and herbaceous vegetation on sandier and humid soils. The reserve is surrounded by *Eucalyptus* spp., coffee and papaya plantations, and some private reserves (Marsden *et al.* 2005).

The Sooretama–Linhares complex is critical for bird conservation in the Atlantic Forest (Marsden *et al.* 2005), having been designated an Important Bird Area (IBA) by BirdLife International (Bencke *et al.* 2006). Its known avifauna comprises *c.*300 species, including

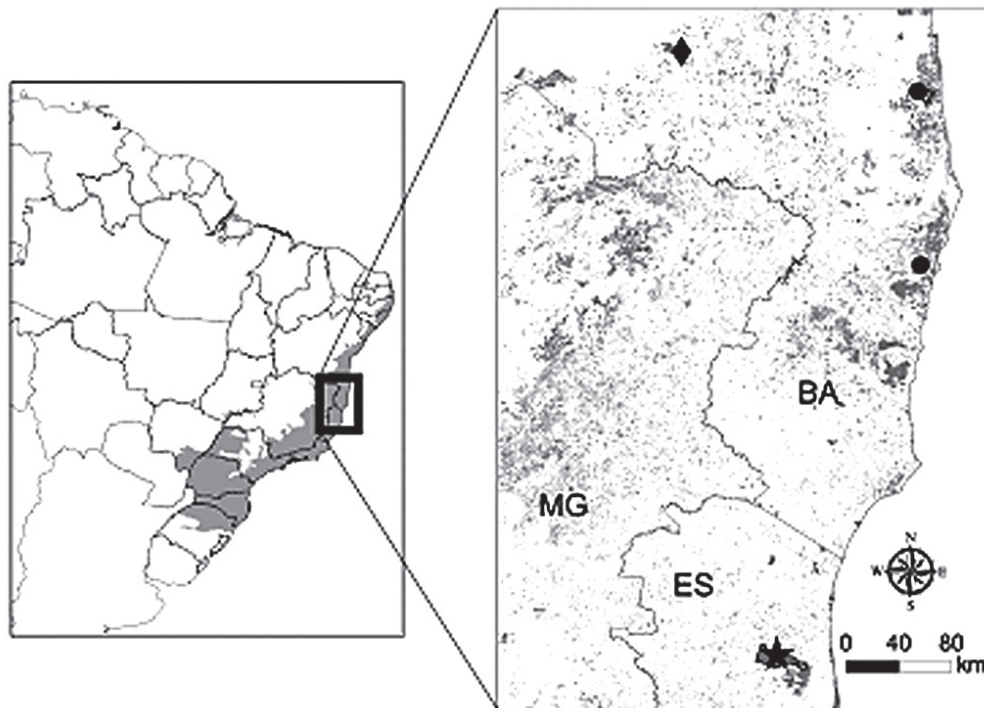


Figure 1. Map showing the Atlantic Forest biome (shaded; left) and Brazilian states of Minas Gerais (MG), Bahia (BA) and Espírito Santo (ES), with recent and historical records of White-winged Potoo *Nyctibius leucopterus* in the Atlantic Forest (right). The diamond marks the type locality at Vitória da Conquista, Bahia, circles other recent records and the star our record at Sooretama Biological Reserve, Espírito Santo.

large raptors such as Black-and-white Hawk-Eagle *Spizaetus melanoleucus*, Harpy Eagle *Harpia harpyja* and Crested Eagle *Morphnus guianensis*, psittacids like Blue-winged Macaw *Primolius maracana*, Red-browed Parrot *Amazona rhodocorytha* and Blue-throated Parakeet *Pyrrhura cruentata*, Banded Cotinga *maculata* and White-winged Cotingas *Xipholena atropurpurea*, and the largest known population of Red-billed Curassow *Crax blumenbachii* (Parker & Goerck 1997, Bencke *et al.* 2006). Furthermore, like other fragments in southern Bahia and central-northern Espírito Santo, it harbours many principally Amazonian taxa, such as White-fronted Nunbird *Monasa morphoeus*, Ringed Woodpecker *Celeus torquatus* and Cinereous Antshrike *Thamnomanes caesius*, suggesting that this region was formerly connected to the Amazonian forest (Willis 1992).

Field work was carried out using binoculars, digital recorders (Sony PCM-D50 and Sound Device) and Sennheiser ME66 microphones, and an iPod and Altec Lansing IM237 speaker for playback. Recordings of *N. leucopterus* used in playback are those presented by Naka *et al.* (2008).



Figure 2. Quirinão trail, Sooretama Biological Reserve (19°03'S, 40°08'W), Espírito Santo, Brazil (Thiago V. V. Costa)

## Results

Survey work was undertaken within Sooretama, mainly along the Quirinão trail, from before dusk until 22.00 h. As the moon rose we periodically whistled and performed playback of the song of *N. leucopterus*. Around 19.00 h, with the full moon at  $c.45^\circ$ , we heard the species' typical call notes (with which we are very familiar in Amazonia),  $c.50$  m distant. We were unable to record the calls but persisted to imitate the song. After  $c.15$  minutes without response, a potoo-like bird flew silently over us in the canopy, which was  $c.25$  m tall with some scattered emergents. Approximately 20 minutes after the first response, and following constant imitation, a bird answered again, and this times its call notes were sound-recorded: a *bweep*, given both perched or in flight (Fig. 3), much like that of nominate Short-tailed Nighthawk *Lurocalis semitorquatus*, but slightly different in frequency and length (pers. obs.). Thereafter, the *N. leucopterus* called repeatedly, including a fast series of call notes, also given by Amazonian birds (pers. obs.). After  $c.15$  minutes, it gave the typical song, a long, descending whistle, *feeeooooo*, after which the bird moved away and was silent for  $c.10$  minutes, before singing spontaneously  $c.20$  m away. The song was heard just twice and could not be sound-recorded.

## Remarks

Both the song and call notes match those of the Amazonian population presented by Cohn-Haft (1993) and Claessens *et al.* (2005), and the topotypical form in Bahia (Whitney *et al.* 2003), which appears slightly different in pitch and length. Whitney *et al.* (2003) mentioned that songs recorded at Una show considerable variation between recordings, and are longer than those of Amazonian birds presented by Cohn-Haft (1993). However,

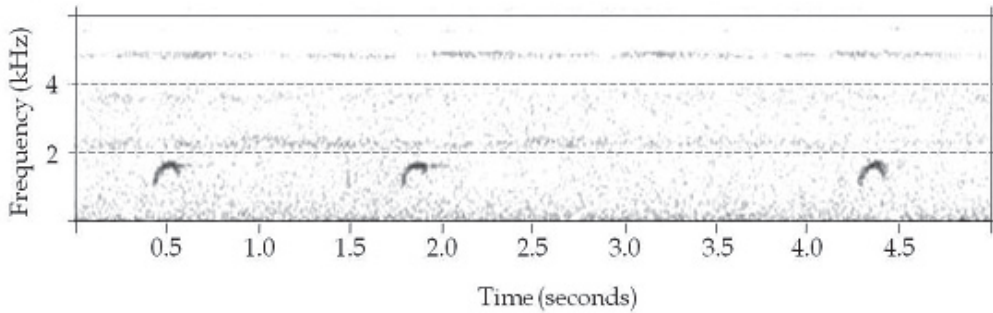


Figure 3. Sonogram of the call notes of White-winged Potoo *Nyctibius leucopterus*, recorded at Sooretama Biological Reserve, Espírito Santo, Brazil, on 4 July 2009, by Thiago V. V. Costa. The recording was made using a Sony PCM-D50 digital recorder and Sennheiser ME66 microphone, and the sonogram created using Adobe Audition 3.0 and Photoshop 7.0.

these comparisons are based on a small sample and the variation could represent an artefact of playback stimulation. Unfortunately, we were unable to compare song length of the Sooretama bird with others, and further recordings are needed to verify the extent of any variation between the two populations.

According to Whitney *et al.* (2003), several attempts to locate White-winged Potoo in southern Bahia and northern Espírito Santo in the 1990s, also using playback or by imitating the Amazonian birds were unsuccessful. These authors do not mention if Sooretama or Linhares were visited during their field work, but A. Whittaker (pers. comm.) has made annual visits (in September–October) since 2002 to Linhares, and G. M. Kirwan (*in litt.* 2010) made annual visits to both Sooretama and Linhares in 1998–2007; both regularly used playback or imitated *N. leucopterus* during nocturnal excursions without success. We were unable to visit other parts of Sooretama, or Linhares, to determine if *N. leucopterus* occurs throughout the entire fragment. However, given that the remnant is continuous, with a homogeneous soil type and appearance to the vegetation, we suppose that the species could occur throughout the complex. If future field work confirms its presence in Linhares, then these reserves will probably support the largest population of *N. leucopterus* in the Atlantic Forest. The complex totals c.50,000 ha, i.e. approximately twice the size of other fragments that support the species in Bahia (see Bencke *et al.* 2006). Furthermore, it lies very close to other forest fragments in the municipalities of Aracruz, Jaguaré and Vila Valério, including Comboios Biological Reserve, Goytacazes National Forest and many unprotected areas, together nearly 170,000 ha (Projeto Corredores Ecológicos 2006).

Our confirmed record adds a new species to the well-known avifauna of Espírito Santo (Simon 2009), and brings to four the number of *Nyctibius* in the study area, including Long-tailed *N. aethereus*, Great *N. grandis* and Common Potoos *N. griseus* ([http://www.vale.com/hot\\_sites/linhares/fauna\\_aves.htm](http://www.vale.com/hot_sites/linhares/fauna_aves.htm)). The last two were also recorded by us. This appears to be the highest number of *Nyctibius* species occurring syntopically in the Atlantic Forest, a phenomenon observed only in suitable parts of Amazonia, where the same four species occur alongside the Amazonian endemic Rufous Potoo *N. bracteatus* (Cohn-Haft *et al.* 1997, Borges *et al.* 2002, Pelletier *et al.* 2005).

The vocalisation of *N. leucopterus* is clearly the best means to locate the species, like other nightbirds. In addition to its nocturnal and canopy-dwelling habits, that this species went unrecorded for >150 years can be explained by the frequency of its song. Like all potoos, it is vocal mostly on moonlight nights, especially at full moon and a few days before (Cohn-Haft 1999; pers. obs.). Particularly in Amazonia, the species apparently seems to

be vocal year-round (Claessens *et al.* 2005). However, it sings very erratically and in some situations does not respond to playback for unknown reasons (O. Claessens, T. Deville & A. Renaudier pers. comm.). On the other hand, *N. leucopterus* occasionally responds to playback even in full daylight (Deville *et al.* 2009). Such unpredictable vocal activity contributes to the species going unrecorded. One complication is that the year-round vocal activity observed in Amazonia may not be replicated in the Atlantic Forest, as the more obvious climatic seasons may also lead to definite singing seasons, making the species even harder to detect. During our field work at Sooretama, *N. leucopterus* appeared less aggressive in response to imitations compared to around Manaus (pers. obs.), and also gave call notes more frequently than the song. Despite the warm, clear night, our observation was made in midwinter, when the species might be expected to be less active and not breeding. Thus, the periodicity of singing in the Atlantic Forest requires further assessment.

Concerning habitat preferences, Amazonian birds occur in the canopy of undisturbed lowland *terra firme* growing on deeply weathered clays and in seasonally flooded forest in black-water drainages (Cohn-Haft 1999, Alvarez & Whitney 2003). Whitney *et al.* (2003) also suggested that the species occurs in white-sand forest, although in the Guianan Shield the species is known only from tall *terra firme*. However, in the Atlantic Forest nutrient-poor, sandier soils appear important to *N. leucopterus*, as observed at Una Biological Reserve (Whitney *et al.* 2003) and Sooretama, which forests are structurally very similar. Although principally found in primary forest, it is also known from forest fragments, edges and clearings near Manaus and at Saint-Eugène, French Guiana (pers. obs.; Cohn-Haft 1993, Claessens *et al.* 2005). If we can extrapolate from this, the species may also be less dependent on vast, uninterrupted primary forest in eastern Brazil, as observed in Bahia (e.g. RPPN Estação Veracel).

The geographical spread of records in the Atlantic Forest (Fig. 1) suggests that the species was formerly more widespread in central-northern Espírito Santo and central-southern Bahia than today. However, following the drastic removal of native lowland forest, nowadays any remaining populations of *N. leucopterus* are confined to a few remnant fragments. Our record in Sooretama makes the species' occurrence elsewhere in Espírito Santo fairly possible. Furthermore, its occurrence in suitable habitat in adjacent Minas Gerais also appears plausible. Specific searches for *N. leucopterus* in the Atlantic Forest should concentrate on sandy soil forests, even in small remnants, and knowledge of its vocal repertoire and behaviour is crucial to the species' discovery. More effort is needed to better understand the species' ecology, behaviour and habitat preferences. Following the future description of the Amazonian bird as a new taxon, the Atlantic Forest population will be endemic to Bahia and Espírito Santo, and thus highly threatened.

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