

# The end of hope for Alagoas Foliage-gleaner *Philydor novaesi*?

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A photograph of an Alagoas Foliage-gleaner bird perched on a branch in a dense vine tangle. The bird is brown with a lighter face and a dark eye. It is facing left. The background is a complex network of thin, brown branches and some green leaves.

Discovered in 1979, the Alagoas Foliage-gleaner *Philydor novaesi* was initially known only from its type locality of Murici in Alagoas, north-east Brazil. However, on 7 February 2003 Juan Mazar Barnett and Caio Carlos discovered a second site for this Critically Endangered species, on the Serra do Urubu in Pernambuco. Subsequently the species became progressively more difficult to find at Murici until the last sighting there in 2007, and we report here the lack of recent records from the Serra do Urubu and other suitable forest fragments, despite intensive searches. It is our suspicion that this bird, which is restricted to the Pernambuco Centre of Endemism, may have slipped to extinction in the last two years, and here we discuss the the causes of this decline and and what can be done for the remaining endemic species in their last fragmented forest bastions.

Alagoas Foliage-gleaner *Philydor novaesi* foraging in a vine tangle at RPPN Frei Caneca, May 2008 (Ciro Albano / [www.nebrazilbirding.com](http://www.nebrazilbirding.com))



Alagoas Foliage-gleaner *Philydor novaesi* at rest at RPPN Frei Caneca, October 2008 (Ciro Albano / [www.nebrazilbirding.com](http://www.nebrazilbirding.com))

## Brazil's most threatened biome

**T**he 'Pernambuco Centre of Endemism' is the formerly contiguous block of 39,567 km<sup>2</sup> of Atlantic Forest located north of the São Francisco River in the states of Alagoas, Pernambuco, Paraíba and Rio Grande do Norte (Prance 1982). Over the last 500 years, this region of high species richness and endemism has suffered the most severe degradation of all Brazilian biomes. The once-extensive forests have become increasingly fragmented, degraded or entirely destroyed to make way for 'seas' of sugarcane and huge cattle ranches. More than 95% of the original vegetation of the Pernambuco Centre has been lost, and its small and isolated forest remnants (mostly on low-lying montane ridges) are subject to ongoing stress from the illegal removal of vegetation for timber and charcoal, and from illegal hunting, leaving them

exposed to edge effects and invasion by non-forest and non-native species (Ranta *et al.* 1998). No large forest blocks remain, and by the onset of the present millennium, 78% of the few existing protected areas were smaller than 5 km<sup>2</sup> (Silva *et al.* 2002). The magnitude and precariousness of the region's ornithological bounty was only belatedly realised at the end of the 1970s (Teixeira 1986), shortly after which four new bird species were described from the Serra Branca, Murici, Alagoas. Amongst these was a foliage-gleaner, discovered in 1979, which resembled the southern Atlantic Forest endemic Black-capped Foliage-gleaner *Philydor atricapillus* but was larger, less rufous with a paler head pattern and entirely lacked that species' rufous nuchal collar. Described four years later (Teixeira & Gonzaga 1983), the Alagoas Foliage-gleaner's scientific name—*P. novaesi*—honoured the late great Brazilian ornithologist Fernando da Costa Novaes (1927–2004).

## A chronology of extinction

Alagoas Foliage-gleaner was initially reported as 'conspicuous' in the Murici forest patch and two specimens were collected in February 1979 (Teixeira & Gonzaga 1983), with an additional four specimens taken between November 1983 and January 1986 (Collar *et al.* 1992), but the region continued to suffer forest loss throughout the 1980s and 1990s until 6,116 ha were finally protected under Brazilian law as the Murici Ecological Station in 2001. However, this has not entirely prevented forest degradation as a result of illegal logging, charcoal extraction, fires and hunting, coupled with threats made against the reserve guards (Whittaker 2001). Solitary Tinamous *Tinamus solitarius* were formerly regular at the reserve up until the mid 1990s (AW, JFP) but there is only one recent (2011) sight record of this species from the reserve (CA) and this species is considered to be very close to extinction in the north-east Atlantic Forest (Amaral & Silveira 2004).

There were no documented records of the Foliage-gleaner between 1992 and 1998, after which single individuals were recorded in 1998 and 1999 (AW, who made the first recordings of the species' loudsong), and at least two separate individuals with different mixed-species flocks in late December / early January 2000 (J. Mazar Barnett & GMK), four birds in 2000 (AW), and a further individual in early 2007 (Minns *et al.* 2010). It is interesting to also note that Orange-bellied Antwren *Terenura sicki* and Pernambuco Foliage-gleaner *Automolus lammi*, two mixed-flock followers, have also declined at Murici, to the brink of local extinction, over roughly the same period, and that at least some birders' reports of *P. novaesi* might have referred to *A. lammi*, which has only recently been recognised at species level (Zimmer 2008). Thus the importance of the discovery of the *P. novaesi* at Frei Caneca, a 630 ha private forest reserve on the Serra do Urubu, by Juan and Caio J. Carlos in early 2003 cannot be overstated. Mazar Barnett *et al.* (2005) relate the encounter:

'A single Alagoas Foliage-gleaner *P. novaesi* was found on 7 February within a large mixed flock, in a tall hilltop forest with dense undergrowth of small trees. Its voice was tape-recorded and the individual attracted to play-back. It moved between 2 and 4.5 m, perching mostly on thin horizontal branches in the crowns of low-stature trees. It was seen pecking a dead leaf on a hanging clump of moss.'

The authors encountered the species again on two subsequent visits:

'On 18 April this species' voice was heard in response to play-back, in the same area as the previous record. Up to four different birds were recorded during September–October, with one individual coming out into the degraded edge of a forested hill.'

Subsequently, the area became widely-known as the best site for seeing Alagoas Foliage-gleaner as well as several other threatened endemic birds of the Pernambuco Centre such as Orange-bellied Antwren and Alagoas Tyrannulet *Phylloscartes ceciliae*. The Foliage-gleaner was also reported from the adjacent 390 ha Pedra D'Anta (Jaqueira) Reserve, which was purchased by SAVE Brasil in 2004, but there is no documented record from this site. Between 2007 and 2010 all records at Frei Caneca involved a lone individual(s) apart from one record of a 'pair' in 2010 (C. Gussoni pers. comm.). The last documented record from Frei Caneca, indeed from anywhere in the world, came on 13 September 2011, when CA filmed a single individual at the regular site on the ridge-top at 08°43'S 35°50'W. There is one subsequent undocumented sight record of a bird seen by Fred Tavares and a tour group on 9 April 2012 (F. Tavares *in litt.*). Since then, there have been no more sightings at Frei Caneca, or the adjacent Pedra D'Anta, nor have any further populations been discovered at any of the other relict forest fragments within the species' range (e.g. Silveira *et al.* 2003). This despite extensive searches using playback, which would occasionally elicit responses from other flock-following species such as White-flanked Antwren *Myrmotherula axillaris* (S. M. Dantas pers. comm.) indicating that the species perhaps persisted in these places in the living memory of these would-be co-members of mixed-species flocks.

## Was Alagoas Foliage-gleaner particularly extinction prone?

The wildlife of the forests of north-eastern Brazil is being endangered by a maelstrom of different threats and drivers. Moreover it is easy to pinpoint a number of factors that may have predisposed the Alagoas Foliage-gleaner to be among the first species to disappear. Foliage-gleaners are notoriously 'area-sensitive' and quickly become extinct in small isolated forest fragments; for instance the famous 250 ha forest fragment adjacent to the Floresta Amazônica Hotel in Alta

Floresta, Mato Grosso, no longer retains any of the five species occurring in the region, even though this patch is apparently acceptable to a pair of Harpy Eagles *Harpia harpyja* (Lees & Peres 2008). Such area sensitivity is probably wholly or partially explained by the dependence of foliage-gleaners on mixed-species flocks. Species associated with such flocks typically possess larger territory sizes than solitary species (Terborgh *et al.* 1990). Clearance of most of the Alagoas Foliage-gleaner's original habitat left few sufficiently large (> 1,000 ha) forest patches to support populations of this species (along with the flock-leading Cinereous Antshrike *Thamnomanes caesioides*), and this loss has continued at the species' last redoubts. In the southern 'Zona da Mata' of Pernambuco, 48% of fragments are smaller than 10 ha and only 7% are larger than 100 ha (Ranta *et al.* 1998). Moreover, Tabarelli *et al.* (2005) reported that the north-east Atlantic Forest has lost 10% of its remaining forest cover since 1989. The Foliage-gleaner was left without sufficiently large forest patches, while those that remained could have been close to the maximum altitude within its range and exposed to edge effects such as drying winds that kill epiphytes and increase susceptibility to forest fires. The greater numbers of openings within the forest at Murici might also have led to incremental tree loss from factors such as wind, which in turn would have led to further opening of the understorey. These local-scale climate changes act synergistically with wider-scale increases in temperature catalysed by sugar cane burning (of waste material) and the exposure of bare soil to the sun (resulting in increased heat absorption)—see, for example, Martinelli & Filoso (2008).

Foliage-gleaners were recorded as foraging by gleaning for invertebrates from leaves, bark, crevices and debris (e.g. Remsen 2003, Parrini *et al.* 2009) but many field observations, both historical and recent, indicated a strong preference for foraging in bromeliads especially in the midstorey (J. Mazar Barnett pers. comm., JFP, AW & K. J. Zimmer pers. obs.). Bromeliads are faring particularly badly in the face of forest loss and degradation: Siqueira-Filho & Tabarelli (2006) found evidence for the local extinction of 20 bromeliad species, including the only known populations of *Vriesea rectifolia* in the north-eastern Atlantic Forest, and all known populations of *Tillandsia* spp. If bromeliads really were its preferred foraging substrate (not to mention that of many other associated plants and animals), the local decline and extinction of these plant species may have been another 'nail in the coffin' of the Foliage-gleaner. No nest of Alagoas Foliage-gleaner

has ever been found, and the only information on breeding comes from specimens collected in early February which had fairly-enlarged testes and were in moult, perhaps suggesting that this was the immediate post-breeding season (Collar *et al.* 1992); but the nest was presumably sited in a hole in a bank as is the case with other members of the group, or within a tree cavity (Remsen 2003). Such nesting sites are probably less plentiful in drier hilltop forest remnants than in bottomland forests alongside rivers, and in such circumstances the species may have also used road banks as nest sites (e.g. Miller *et al.* 2012) which could function as an ecological trap—because of human disturbance—further reducing breeding success. Such sites would also be more exposed to nest predation, rates of which may be elevated because of the high densities of medium-sized predators in small Neotropical forest fragments that lack large predators (Ritchie & Johnson 2009).

## Resurrecting *P. novaesi*?

So what of the future? If the last Alagoas Foliage-gleaner of the Serra do Urubu investigated its last bromeliad some time in 2012, is all hope lost? All remaining forest patches should be checked, but we are increasingly pessimistic as to the possibility of the species being encountered again. Functionally, this bird was extinct long before it was described, with mixed-species flock assemblages having collapsed across the Pernambuco Centre. There is much discussion in the contemporary conservation literature of the importance of restoring species interactions, rather than merely species diversity alone (Tylianakis *et al.* 2010) and in some cases this may warrant the use of extant ecological substitutes (Griffiths *et al.* 2011). If, in the not-too-distant future, the remaining forest fragments could be effectively protected and land secured for reforestation then a viable landscape for Alagoas Foliage-gleaners may again become established. Remsen (2003) considered that *novaesi* 'evidently forms a superspecies with *P. atricapillus*' making the latter species both the most obvious choice of an ecological surrogate for translocation, or even more outlandishly as a candidate for 'de-extinction' by employing future cloning technologies (Zimmer 2013). However, despite this inferred kinship with Black-capped Foliage-gleaner, it is one of Brazilian ornithology's 'worst-kept secrets' that many familiar with the species in life were suspicious that Alagoas Foliage-gleaner may possess multiple aliases. They had noted apparently significant vocal variation between individuals, suggesting

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Left: Alagoas Foliage-gleaner *Philydor novaesi* inspecting a dead leaf cluster at RPPN Frei Caneca, December 2007 (Ciro Albano / [www.nebrazilbirding.com](http://www.nebrazilbirding.com))

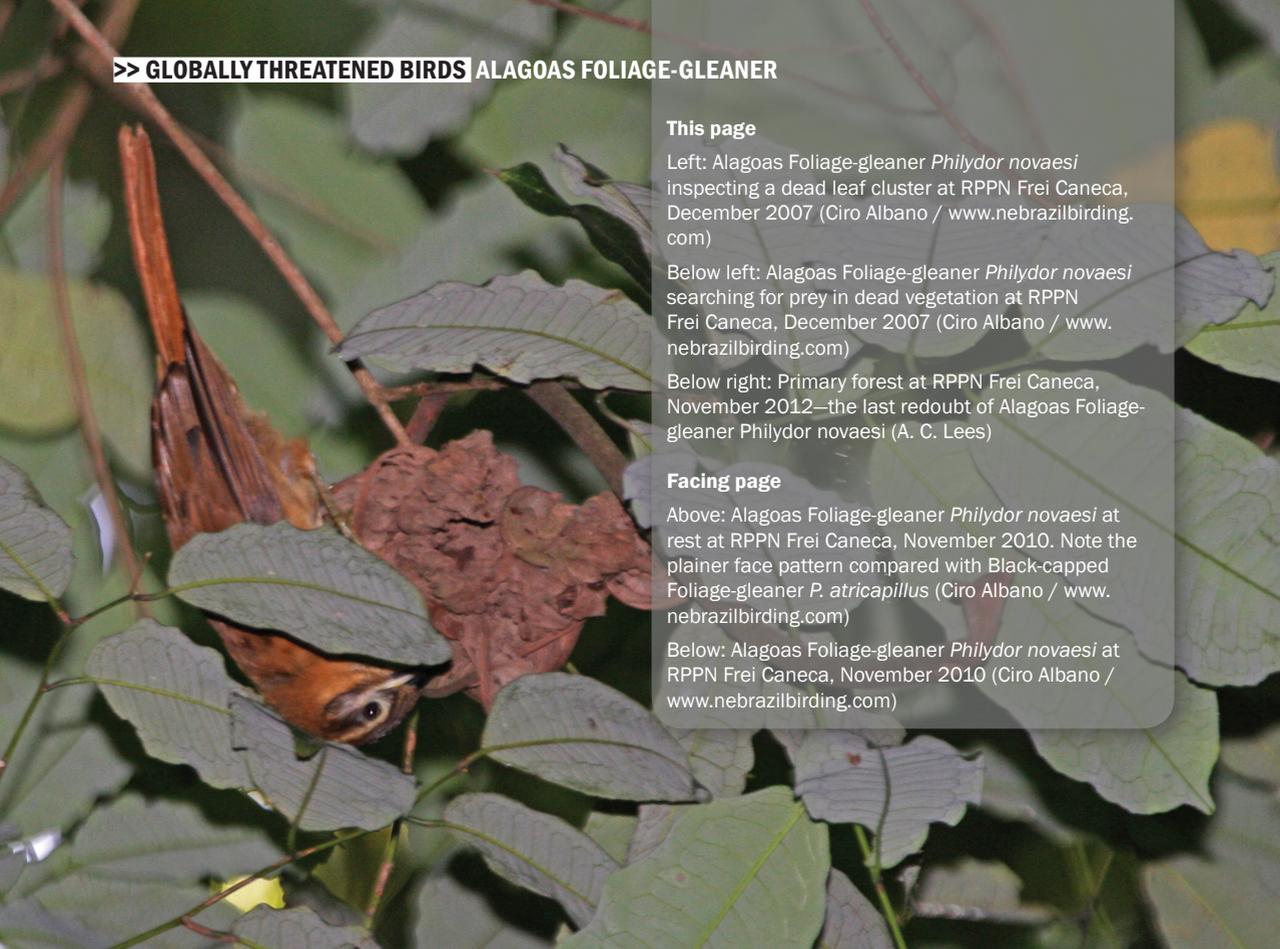
Below left: Alagoas Foliage-gleaner *Philydor novaesi* searching for prey in dead vegetation at RPPN Frei Caneca, December 2007 (Ciro Albano / [www.nebrazilbirding.com](http://www.nebrazilbirding.com))

Below right: Primary forest at RPPN Frei Caneca, November 2012—the last redoubt of Alagoas Foliage-gleaner *Philydor novaesi* (A. C. Lees)

**Facing page**

Above: Alagoas Foliage-gleaner *Philydor novaesi* at rest at RPPN Frei Caneca, November 2010. Note the plainer face pattern compared with Black-capped Foliage-gleaner *P. atricapillus* (Ciro Albano / [www.nebrazilbirding.com](http://www.nebrazilbirding.com))

Below: Alagoas Foliage-gleaner *Philydor novaesi* at RPPN Frei Caneca, November 2010 (Ciro Albano / [www.nebrazilbirding.com](http://www.nebrazilbirding.com))





that a cryptic species might be awaiting discovery. In this respect, Juan and his collaborators had been working on a paper elaborating on some vocal and behavioural similarities to Pale-browed Treehunter *Cichlocolaptes leucophrus*. This was alluded to by Robbins & Zimmer (2005) who excluded the Alagoas Foliage-gleaner from their analysis of vocal variation in *Philydor* 'because certain aspects of its vocal repertoire are anomalous relative to all other members of the genus'. With no tissue samples preserved, we may have to wait until samples from the unique type series can be analysed if we are to understand the species' true phylogenetic affinities. This information should certainly be made available before any more drastic translocation or 'Jurassic Park'-style conservation interventions are considered; indeed, this case highlights the importance of phylogenetics in avian conservation.

## What does the future hold for the endemic forest avifauna of the Pernambuco Centre?

We have arrived at a critical juncture for many threatened species in this region. Alagoas Foliage-gleaner is not the first endemic species to have apparently disappeared; despite extensive use of playback across the region and repeated visits to its type locality, there have been no documented records of Pernambuco Pygmy Owl *Glaucidium mooreorum* since October 1990 (Silva *et al.* 2002), and just one subsequent (multi-observer) sight record (in November 2001). Some species may have been lost before they were even discovered (e.g. Olmos *et al.* 2001); these undocumented 'Centinelan' extinctions (*sensu* Wilson 1992) of undescribed taxa from north-east Brazil probably included a curassow in the genus *Crax*: the 'Mituporanga' of Marcgrave (1648), which also figured in the colour pictures of the '*Theatrum Rerum Naturalium Brasiliae*' (Schneider 1938, Teixeira *et al.* 1986). For other species, there is hopefully still time. Obviously, purchasing farmland around the remaining forest patches, reforesting it and protecting these habitats will be critical for the future survival of many area-sensitive species (and will help to buffer them from edge effects), as will more directed socio-economically oriented conservation strategies to reduce forest degradation. For instance, fuelwood accounted for 92% of annual wood consumption in the municipality of Igarassu in Pernambuco in 2007 (Medeiros *et al.* 2011). Identifying and solving such issues should prove to be relatively

straightforward compared to addressing problems such as regional climate change brought about by forest loss...

However, many species will require more drastic measures. Next in line for global extinction appears to be the Critically Endangered Alagoas Antwren *Myrmotherula snowi* of which an estimated fewer than 30 individuals remain in three disparate forest patches (Murici, Alagoas; Engenho Jussará, Gravatá, Pernambuco; and Mata do Estado, São Vicente Férrer, Pernambuco). In addition the species formerly occurred on the Serra do Urubu (Mazar Barnett *et al.* 2005), but the last record there concerned a single female tape-recorded on 13 December 2007 (Albano 2007a). Emergency *in-situ* conservation measures such as predator removal (particularly of nest predators if they can be identified using video camera) or translocations of 'stranded' individuals in tiny fragments may help. However, we consider that *ex-situ* conservation efforts may be the only chance for the long-term survival of this species and others. Knowledge of animal husbandry and captive-breeding of suboscine passerines is limited, so a programme should be instigated immediately, using an ecological substitute such as White-flanked Antwren on which to practice. Conservation practitioners would do well to heed the advice of Groombridge *et al.* (2004) who tried and failed to save the Hawaiian Po'ouli *Melamprosops phaeosoma* from extinction:

'Strong leadership and decision-making have been key components of the recoveries of the Mauritius Kestrel [*Falco punctatus*] and the Chatham Islands Black Robin [*Petroica traversi*], each successfully restored from a single pair (Butler and Merton, 1992; Jones *et al.* 1995), and this type of leadership, involving high-risk actions, will continue to be important when dealing with today's species of extreme rarity, where increasingly bolder strategies may be needed.'

The protection of the Serra do Urubu is a fitting legacy to Juan's life, but the fight to save its special species from global extinction is only just beginning. We might also mention the as-yet undescribed *Myiornis* pygmy tyrant taxon discovered by Juan and Dante Buzzetti at Frei Caneca (see Albano 2007b), which has also been observed at Murici (AW); this bird's description also promises to represent another lasting memorial to Juan's short but outstanding life.

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