



Figure 1. Lined Forest Falcon *Micrastur gilvicollis*, Manaus, Amazonas, demonstrating the most distinctive field mark distinguishing it from Cryptic Forest Falcon *M. mintoni*: the two narrow horizontal tail bands. (Andrew Whittaker/ Birding Brazil Tours)

Unravelling the forest falcons to expose a hidden species: Cryptic Forest Falcon

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On 26 October 1997, after guiding an exciting three-week birding tour of south-eastern Brazil, I boarded a flight in Rio de Janeiro destined for Caxiuanã, Melgacao, Pará. Although worn out, I was looking forward very much to scouting out a new tour destination in my preferred biome: the Amazonian rainforest. Little did I know what results of this trip would be!

In the early hours of the morning I arrived in the capital city of Pará, Belém. I took a taxi to a nearby hotel for a few hours rest before continuing my travels by single-engined plane onto Marajó Island, an island the size of Switzerland located at the mouth of the mighty river Amazon. From Breves I embarked in a small 25 horse-power skiff full of gasoline barrels, food and supplies covered by a tarpaulin, destined for the remote Estação Científica Ferreira Penna in Caxiuanã: four hours of bouncing up and down uncomfortably on an extremely hard seat with the strong tropical sun beating down on me, occasionally cooled by wet spray hitting my face. Raucous calls came from a flock of stunning endangered Golden Parakeets *Guarouba guarouba*, their vivid golden and green colours perfectly depicting the Brazilian flag. A backdrop of tall *terra firme* forest signalled that we were getting closer and soon we entered an enormous body of water, encountering wind and waves with white caps; a huge tropical storm, with towering black cumulonimbus clouds, was fast approaching. I was extremely anxious to arrive before our heavily laden boat was either swamped by a larger wave or got caught up in a hair-raising electrical storm! At last, after almost 36 hours travel, I arrived at my destination where a small wooden jetty marked the entrance to the Ferreira Penna Research Station.

After a good meal, I was escorted to my lodgings and upon entering the room I found out I was sharing with a Brazilian researcher. I slipped out into the dark forest clearing and located the trailhead for the morning. Then I organised my field equipment, recording equipment, tape cassettes, and remaining gear, ready for an early

wake-up and at last collapsed exhausted onto my bed. A little while later I was rudely awakened by the loudest snoring I have ever heard from across the room! It sounded as if a group of Howler Monkeys had moved in, making it utterly impossible to sleep. Half awake, I dragged out my mattress and alarm clock, closed the door and laid them down at the end of the corridor on the floor. Here the mosquitoes were easier to put up with than that awful racket!

At 04h00 I was walking along a narrow rainforest trail to a nearby canopy tower. My main aim was to tape-record the voice of the recently described Brigida's Woodcreeper *Hylexetastes brigidai* (Silva *et al.* 2002), and I knew that my best chance to achieve this was around dawn, when this genus is most vocal. Half an hour later, with sweat dripping off me, I found myself 45 metres up in amongst the dark forms of emergent tree crowns in this pristine *terra firme* forest reserve. Several minutes later, I imitated the long drawn out whistle of a White-winged Potoo *Nyctibius aethereus* and, to my delight, quickly elicited a response: a bird landed in the top of an adjacent dead emergent tree, its eye-shine reflecting in my torch and the extensive white wing patches clearly visible. Shortly, a brighter glow in the east began to signal dawn and the dawn chorus began, as a Greyish Mourner *Rhytipterna simplex* gave its diagnostic dawn song (throughout its range, it is often the first passerine to be heard in the pre-dawn). Next a distant Slaty-backed Forest Falcon *Micrastur mirandollei* started vocalising just as a deep, almost plane-like roaring of a group of Red-handed Howlers *Alouatta belzebul* drifted in from the west. Dawn was finally breaking over the

Amazon rainforest, and over the next 15 minutes or so I probably heard 30 different species before finally I recognized the one I had been waiting for: Brigida's Woodcreeper. I immediately whipped out my directional microphone, switched on my Sony recorder, and began recording the drawn-out shrieking song. While recording, I was extremely puzzled and perplexed to hear the rhythmic song of what sounded like the north bank Spotted Antpitta *Hylopezus macularius* here on the south bank! At the time the loudsong of all south bank 'Spotted Antpitta' was known to be noticeably different (less musical and with fewer notes), so I made a mental note to inform Tom Schulenberg and Niels Krabbe, who at the time were working on a comprehensive overview of the Ground Antbirds (Formicariidae) (Krabbe & Schulenberg 2003).

However, in an instant my attention swung onto something much more important and exciting: a vocalisation that was entirely new to me. After hearing the distinctive note repeated a couple of times, I recognised its characteristic quality as belonging to an unknown *Micrastur* Forest Falcon. I had extensive field experience with all known Brazilian Forest Falcons and knew their complex repertoires intimately. This had already helped me add Buckley's Forest Falcon *M. buckleyi* to the Brazil list and I was the first to describe its vocal repertoire (Whittaker 2001). At this point my mind went into overdrive; trembling I thought to myself, "It's a new species!" The only *Micrastur* I did not have field experience with was the Plumbeous Forest Falcon *M. plumbeus*, but I knew that it was rare and poorly-known, occurring only west of the Andes with a restricted range in Colombia and Ecuador, so it was almost impossible for it to occur here. My microphone pointing in its direction, I was frozen, hardly breathing and looking intently at my recorder needle and counter to confirm I was really recording this exciting voice well and not burning it out (due to insect noise) or that my machine was not stuck on pause. I kept thinking to myself, "This is not just any new species, such as a new passerine, but a new raptor!" It was almost too much to believe! I waited for what seemed like an eternity for the bird to finish what I later described as its 'territorial advertising song' (which can continue on for as long as two-and-a-half minutes) before I switched off the recorder. Quickly, I rewound my tape and hit play at a low volume to confirm I had captured the whole vocalisation, which to my great relief I had.

I descended the tower as quickly as possible, and at the bottom I waited to see if it vocalised again, which fortunately it did. I started making

my way by bushwhacking through the still-gloomy, dense forest understorey towards the call. The bird was about half a kilometre away, and as I pushed on I marked my way by snapping small branches in order not to get lost. Finally I was close enough to make a much better quality tape recording. In fact, I made several recordings, since I had decided that if I waited a little longer the light would improve and I might have a better chance of finding the bird. My adrenalin levels went through the roof as I finally hit the tape-playback button with the expectation of seeing a new Forest Falcon and wondering what it would look like! I already knew that I would have to be very patient and would need some luck to see it at all. *Micrastur* species are always elusive and a real challenge to see—almost impossible without playback. Finally the time had come, and I played back a series of notes. I stopped and waited, eyes peeled, urgently scanning the midstorey for the slightest hint of movement, but could see nothing. A couple of minutes went by before I played more tape. But still there was no response. I therefore decided to wait and abstain from further playback in case the bird had approached unseen (as *Micrastur* often do), in the hope that it would start to call again.

The minutes ticked by until I finally heard a very quiet 'whisper song' response and, better still, the bird had approached closer and was within what I estimated to be 50 m. As still as a statue, with a large tree trunk behind me, I quietly hit the playback button, all my senses focused in the direction of the song. I caught a quick flash of movement in the midstorey, as the bird flew closer and with my naked eyes I could see from its form that it was indeed a small raptor. My heart raced as I raised my binoculars ever-so-slowly to my eyes, and at last I could happily confirm my suspicions: I had a neat-looking Forest Falcon in my field of view! It was 30 m away, 10 m up and face-on, looking intently at me with striking white eyes surrounded by bold, bright orange facial skin; its white underparts showed the typical horizontal dark barring. I was amazed by its striking resemblance to the monotypic Lined Forest Falcon *M. gilvicollis*, which I knew so well from Manaus, so I immediately knew that I was dealing not just with a new species of *Micrastur* Forest Falcon but an extremely cryptic one at that. What were the plumage differences?

Hypnotised, over the next couple of minutes we watched each other; I had no camera in those days, so I was paying great attention to the plumage details. Finally, the bird turned on its perch, giving me my first back view and I was instantly struck by a single, very prominent broad



Figure 2 (above left). Head shot of subadult Lined Forest Falcon *Micrastur gilvicollis*, Manaus, Amazonas, demonstrating its close similarity to Cryptic Forest Falcon. (Andrew Whittaker/Birding Brazil Tours)

Figure 3 (above right). Subadult Lined Forest Falcon *Micrastur gilvicollis*, Manaus, Amazonas, clearly showing the coarser and more extensive underpart barring (extending much lower down the belly) than in Cryptic Forest Falcon *M. mintoni*. (Andrew Whittaker/Birding Brazil Tours)

Figure 4 (below left). Adult Cryptic Forest Falcon *Micrastur mintoni*, Paranaita, Mato Grosso, showing single broad white central tail band (subadult has two). (Andrew Whittaker/Birding Brazil Tours)

Figure 5 (below right). Adult female Cryptic Forest Falcon *Micrastur mintoni*, Borba, Amazonas. (Andrew Whittaker/Birding Brazil Tours)





Figure 6. Adult Cryptic Forest Falcon *Micrastur mintoni* head shot, Paranaita, Mato Grosso, demonstrating its close similarity to Lined Forest Falcon. (Andrew Whittaker/Birding Brazil Tours)

white tail-band before it flew off. Despite more tape-playback, I did not succeed in seeing the bird again. My mind was racing and I was already planning a return expedition to collect a specimen, while simultaneously being anxious to inform my birding pals of this major discovery. I almost ignored a group of fine Dark-winged Trumpeter *Psophia viridis dextralis* calmly walking in front of me as I crashed my way back through the undergrowth to the trail. Over the next couple of days I collected several more tape recordings of the new *Micrastur* before returning to Belém.

On arrival I anxiously made my way to the Museu Paraense Emílio Goeldi (MPEG) to check through their Forest Falcon specimens. I felt like a boy at Christmas again as I pulled out the drawer containing Lined Forest Falcon specimens. After carefully looking through them, I discovered that they could be assorted into two distinctly different plumage types. After arranging the skins into these plumage types, to my surprise several specimens matched the distinctive field characters of the bird I had seen at Caxiuana, including the single broad white tail-band (Fig. 4), together with additional, more subtle plumage differences. To further confuse identification, several specimens had not one but two broad white tail bands (which I later discovered to be the subadult plumage of the new species). I even found to my surprise that one of these new types had been collected in Caxiuana. The other plumage type, with two narrow tail bands (Fig. 1), fitted perfectly the established plumage of the Lined Forest Falcon (Fig. 2, 3) that I knew so well from Manaus, where I had regularly caught them in mist nets. Now at last I had seen specimen proof and I was more convinced than ever that I had made a major discovery: an

amazingly cryptic new *Micrastur*! However, I knew that a lot of work would be required in order to have this discovery accepted. More importantly, I still lacked the key to describing a new species: a type-specimen with voucher tape-recording.

Almost two years later, in August 1999, I mounted a mini expedition returning to Caxiuana along with Dionísio Neto, a taxidermist working for the Goeldi Museum. Our main aim was to obtain a type-specimen, a voucher tape-recording of its voice and tissue samples for future genetic analysis. On the early morning of 2 August, I was successful in tape-recording several vocalisations (MLNS 107100–107103) before calling in the female that we collected as a holotype specimen (MPEG 54849). At last the final proof we required for its formal description had been obtained. One might think that the work was finished; however, the real grinding work to prove such a discovery to the scientific world still had to be accomplished.

The description of a cryptic species

Fortunately I live in Manaus, Amazonas, Brazil, in the middle of the Amazon rainforest. This, combined with being a professional bird guide, gave me countless opportunities to make further tape recordings of the new species and Lined Forest Falcons. So, over the next several years, either before starting to guide birding groups or during research trips, I would spend the pre-dawn walking narrow forest trails playing Forest Falcon recordings all over Amazonia and even in the Atlantic Rainforest of Espírito Santo. This resulted in considerable loss of sleep but I did accumulate thirty-five different recordings of the new species as well as thirty of Lined Forest Falcon and twenty Barred Forest Falcon too. I also quickly began to get a clear idea of the new raptor's exact distribution and confirmed that it also occurred in Bolivia where I tape-recorded seven birds from Santa Cruz. Furthermore I collected copies of all catalogued vocalisations of all *Micrastur* species from the Macaulay Library of Natural Sounds (MLNS) at the Cornell Laboratory of Ornithology and the British Library of Natural Sound Archive. Also several of my birding colleagues kindly shared their Forest Falcon recordings. I listened to all these Forest Falcon recordings and found that a quarter of them had been incorrectly identified to species.

I also visited the Museu Nacional de Rio de Janeiro (MNRJ) and Museu de Zoologia da Universidade de São Paulo (MZUSP), where I encountered other misidentified specimens

referring to my new taxon. Along with the help of museum curators from around the world including those of the Academy of Natural Sciences of Philadelphia (ANSP), the Museum of Natural Science of Louisiana State University (LSU) and Naturhistoriska Riksmuseet Stockholm (NRM), we managed to locate several further specimens of the new *Micrastur* that had been misidentified as either Lined or Barred Forest Falcons. My efforts culminated in a formal description in the *Wilson Bulletin* (Whittaker 2002), in which I named the bird ‘Cryptic Forest Falcon *Micrastur mintoni*’ (Fig. 4, 5, 6), the specific epithet honouring my first childhood birding mentor in the UK, Dr. Clive Minton.

This discovery is a perfect example of the utility of our museum collections (Collar *et al.* 2003) and the continued need for the collecting of voucher specimens if we are to continue to discover new cryptic taxa (Winker 1991, Remsen 1995). As further confirmation of this, the ‘Spotted Antpitta’ that I heard from the canopy tower has now been recognised as a separate species, Sneath’s Antpitta *Hylopezus paraensis* (Carneiro *et al.* 2012), and the naming of yet another new cryptic species being described west of the rio Xingu called the Alta Floresta Antpitta (*Hylopezus whittakeri*) is another future story.

One extremely important question still remains unanswered regarding the Cryptic Forest-Falcon: does the disjunct Atlantic Rainforest population still exist and, if so, is it really another cryptic species waiting to be rediscovered and described?

At last and just for curiosity, on my initial trip to Caxiuanã, I observed and tape-recorded a distinctive new *Euphonia* species from the canopy tower, although the bird has avoided our collecting attempts on several occasions over subsequent years. The Amazon rainforest is the richest ecosystem on our planet and countless exciting discoveries await future ornithologists—but it does not give up its hidden secrets easily...

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