

## New records of rare screech owls (*Megascops*) and pygmy owls (*Glaucidium*), with taxonomic notes and a conservation assessment of two globally imperilled species in Ecuador

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El conocimiento sobre las aves nocturnas del Ecuador, y del Neotrópico en general, es deficiente. Apenas se han documentado ciertos detalles de la historia natural de la mayoría de búhos (Strigidae); mientras, la distribución en este país de al menos 11 especies de las 28 existentes todavía no se comprende bien. Presentamos nuevos registros de distribución de ocho especies de autillos (*Megascops*) y mochuelos (*Glaucidium*) en Ecuador, con algunas extensiones de rango altitudinal y geográfico. Además, hacemos una evaluación más detallada del estado de conservación de una especie globalmente amenazada (Mochuelo de Bosque Nublado *G. nubicola*) y una casi amenazada (Autillo Colombiano *M. colombianus*). Concordamos que *M. colombianus* se considere Casi Amenazada en el país porque su declive poblacional aparenta ser leve, el grado de protección es moderado (44%) y las poblaciones colombianas pueden proveer inmigrantes. Por su parte, *G. nubicola* podría calificar como En Peligro por densidades poblacionales bajas, pocas localidades, declinación moderada y escasa protección; sin embargo, una aproximación más conservadora sería asignarle la categoría Vulnerable, en concordancia con las evaluaciones actuales. Sugerimos una revisión de su categoría global.

Amongst Neotropical birds, nocturnal species are some of the least known<sup>7</sup>. For example, of 28 species occurring in Ecuador a mere two taxa, Barn Owl *Tyto alba punctatissima* and Short-eared Owl *Asio flammeus galapagoensis*, both subspecies endemic to the Galápagos archipelago, have been studied in some detail<sup>12</sup>. Knowledge of the natural history of no fewer than 24 species inhabiting mainland Ecuador is deficient, and even the Ecuadorian distributions are poorly known for at least 11 of these<sup>10</sup>.

The two richest genera of Strigidae occurring in Ecuador, *Megascops* screech owls (eight species) and *Glaucidium* pygmy owls (six)<sup>23</sup> range throughout the country, a few of them widespread (e.g., Andean Pygmy Owl *G. jardinii*, Tropical Screech Owl *M. choliba*)<sup>26</sup>, but many species are confined to narrow altitudinal belts or small sections of the Andes, including some restricted to Endemic Bird Areas<sup>29</sup>.

An assessment of species at risk in Ecuador, published in 2002<sup>11</sup>, ranked one pygmy owl (Central American *G. griseiceps*) as Vulnerable, and two screech owls (Choco *M. guatemalae (centralis)* and Colombian *M. colombianus*) as Near Threatened. At a global scale<sup>4</sup>, *M. colombianus* is ranked Near Threatened, whilst Cloud-forest Pygmy Owl *G. nubicola* is ranked Vulnerable. The latter species was also suggested to be Vulnerable in Ecuador by Freile *et al.*<sup>9</sup>.

To understand the current distribution and status of rare *Megascops* and *Glaucidium* in Ecuador, we undertook field work and a thorough compilation of museum, literature and unpublished records in order to model species distributions and

evaluate them against habitat loss and protection. Evaluation of the distribution and conservation status of nine focal species is underway. Here, we summarise new records, range extensions and new altitudinal data obtained for all focal species except West Peruvian Screech Owl *M. roboratus*. Furthermore, we discuss in more detail the status of those species of global concern (*M. colombianus* and *G. nubicola*) whose ranges are confined to the Andean slopes of the Chocó region. Taxonomy follows SACC<sup>23</sup>, but subspecies recommended by Ridgely & Greenfield<sup>26</sup> as valid species were also evaluated. Sound-recordings of most new records are archived on [www.xenocanto.org](http://www.xenocanto.org) (XC80927 *M. guatemalae roraimae (napensis)*; 80928, 80930 *M. guatemalae centralis*; 80934, 80940 *M. colombianus*). Museum acronyms: ANSP = Academy of Natural Sciences, Philadelphia; MECN = Museo Ecuatoriano de Ciencias Naturales, Quito.

### Species accounts

#### Rufescent Screech Owl *Megascops ingens*

Four new sites at 1,500–1,780 m (Table 1). Very few records—though presumed to range continuously over the entire east Andean slope<sup>26</sup>—even from Napo and other northern provinces<sup>19</sup>, despite its presence in neighbouring Colombia<sup>16</sup>. Sympatric with closely related Cinnamon Screech Owl *M. petersoni* at Chontayacu (1,614 m). Also found in syntopy at the edge of stunted forest on sandy soil at 2,100 m in Tapichalaca reserve, prov. Zamora-Chinchipec, by N. Krabbe (XC85949–950), with *M. petersoni* responding aggressively to *M.*

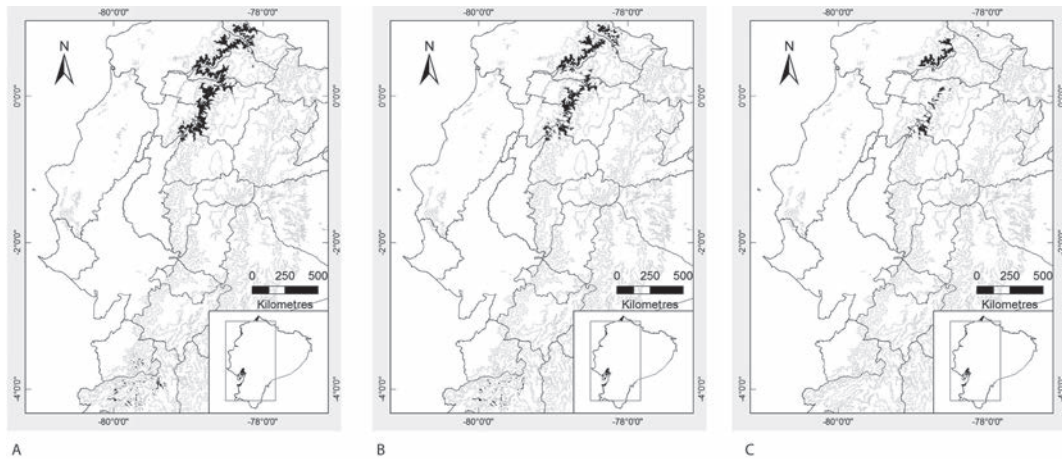


Figure 1. Historic, current and protected range of Colombian Screech Owl *Megascops colombianus* in Ecuador. Pale grey areas indicate elevations of 500–2,000 m. Black lines indicate provincial boundaries.

*ingens* song. At Chinapinza, Zamora-Chinchi, both were collected, *ingens* at 1,450 and 1,950 m (ANSP), *petersoni* on a stunted ridge at 1,700 m where no *ingens* was heard (ANSP, MECN). Both species broadly overlap altitudinally<sup>10,26</sup>. It has been hypothesised that they segregate elevationally where syntopic, with the smaller *M. petersoni* ranging above *M. ingens*<sup>17</sup>, but clarification of their ecological requirements is needed.

#### Cinnamon Screech Owl *Megascops petersoni*

Three new localities at 1,230–1,740 m found during field work, and two unpublished museum records from prov. Morona-Santiago (Table 1). Very few records of this recently described species<sup>8</sup> exist. It is thought to range along the entire east Andean slope<sup>19,26</sup>. Additional records were obtained by N. Krabbe at Tapichalaca reserve (XC85950), at 2,100 m (see above), and south-east of Chito, in the Zumba region of southernmost Zamora-Chinchi<sup>18</sup>.

#### Vermiculated (Foothill or Napo) Screech Owl *Megascops guatemalae roraimae (napensis)*

Discontinuous records throughout the entire eastern Andean foothills. Found at four new localities (Table 1), with two previously unpublished specimens at MECN, from Cerro Guayusa (MECN 7772) and Unsuants (MECN 7637), prov. Morona-Santiago. Recorded at 1,400 m in the Nangaritza region, where syntopic with *M. petersoni* (heard at the same point, but *M. petersoni* ranging slightly higher). Intricate taxonomy unresolved. Following Hardy *et al.*<sup>13</sup>, Ridgely & Greenfield<sup>26</sup> treated these birds as subspecies *napensis* of a specific *M. roraimae*, but suggested that *napensis* might be specifically distinct.

#### Vermiculated (Chocó) Screech Owl *Megascops guatemalae 'centralis'*

Known from a single record in south-western prov. El Oro<sup>18,26</sup>. Thorough searches resulted in four new localities in El Oro and one in Azuay (Table 1), at 800–1,500 m. That in Azuay sets a new upper elevational limit, as it had previously been reported only to 1,000 m<sup>26</sup>. Not found in the area between western Pichincha and El Oro, but our field work in this region was limited and it remains poorly explored ornithologically<sup>19</sup>. This taxon, described by Hekstra<sup>14</sup> is not recognised by some authors<sup>17,20</sup> who merge it and Hekstra's<sup>14</sup> *pallidus* of north Venezuela with *vermiculatus* of Costa Rica. *M. centralis* is not always recognised<sup>6</sup>, but was treated at species level by Hardy *et al.*<sup>13</sup> and Ridgely & Greenfield<sup>26</sup>. A simple comparison of recordings at [www.xeno-canto.org](http://www.xeno-canto.org) revealed apparently qualitative differences in length (number of notes) and inflection at the end. For example, XC65705 (Puerto Viejo, Heredia, Costa Rica), labelled as *vermiculatus*, is markedly longer and less inflected than all recordings of *centralis* (XC60677 and 47011 from Panama; 71402, 12952, 9902; 9861 from Ecuador; and 10835 from Colombia). Taxonomy in the *M. guatemalae* 'species' is very complex, and as many as 3–4 species are probably involved<sup>17</sup>. Whether *vermiculatus* and *centralis* co-occur in eastern Costa Rica requires confirmation (N. Krabbe *in litt.* 2011). A thorough analysis of vocal variation is needed.

#### Subtropical Pygmy Owl *Glaucidium parkeri*

Found at four new localities (Table 1), including an unpublished record by L. Ordóñez<sup>22</sup>. Its distribution is probably continuous over the entire Andean foothills of Ecuador (1,000–2,000 m)<sup>19,27</sup>, possibly reaching neighbouring Colombia, where unrecorded to date.

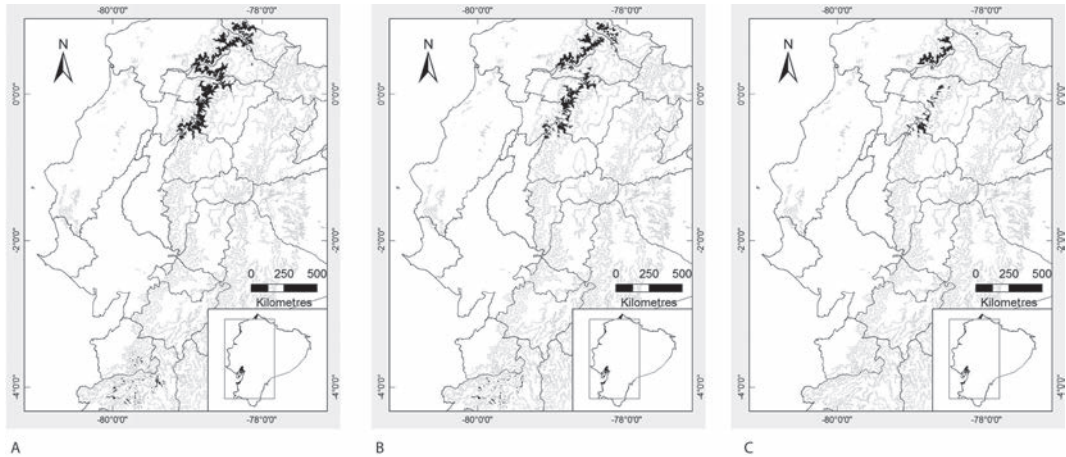


Figure 2. Historic, current and protected range of Cloud-forest Pygmy Owl *Glauclidium nubicola* in Ecuador. Pale grey areas indicate elevations of 500–2,000 m. Black lines indicate provincial boundaries.

#### Central American Pygmy Owl *Glauclidium griseiceps*

Four additional localities for this poorly known species (Table 1), which was only recently discovered in Ecuador<sup>26</sup>, including the southernmost ever (10 km west of Puerto Quito, Pichincha). Observed by P. Moscoso & JFF at c.600 m (La Sabalera, Carchi); previously recorded up to 350–400 m.

#### Threatened species conservation assessment

##### Colombian Screech Owl *Megascops colombianus*

Endemic to Andean slopes of the Chocó region, ranging along the Pacific slope of the western Andes in Colombia (dpto. Chocó), south to northern Cotopaxi<sup>3</sup>. We found it at two sites in Bolívar (Table 1), extending its range c.140 km south, and a little above its previously documented upper elevational limit (2,400 m<sup>26</sup>). Also, it was recently found further west, in the Mache-Chindul coastal range<sup>5</sup>.

Distribution of *M. colombianus* in Ecuador was modelled using ArcMap 9.3 with 26 locality points (Fig. 1a). Unlike previous attempts to illustrate the species' range<sup>19,26</sup>, our model extends it south to western prov. Chimborazo via a narrow altitudinal band, and includes the Mache-Chindul range, with an overall original range of 6,762 km<sup>2</sup>. However, versus the current deforestation scenario (Fig. 1b), range size shrinks to 4,142 km<sup>2</sup>, i.e. a reduction of 39% of its original distribution. Further constraining the model (Fig. 1c) revealed that 1,840 km<sup>2</sup> (44%) of its Extent of Occurrence is currently protected (state-run and private / communal protection forests). It should be noted that protection forests are not part of the

National Network of Protected Areas, and that the current state of many protection forests is either undetermined<sup>1</sup> or known to be undergoing severe degradation.

An assessment of the species' current status in Ecuador using IUCN<sup>30</sup> criteria for regional assessments resulted in Near Threatened status at national level, in accordance with previous assessments<sup>11</sup>. An estimated reduction in range of 30% over the last ten years or three generations, as well as in the next ten years or three generations, as inferred from the percentage of range loss (39%) satisfies Vulnerable (although range and population decline might actually be lower). Similarly, Extent of Occurrence (i.e., distributional range) <20,000 km<sup>2</sup>, where ongoing deforestation suggests continuous decline, might also comply with Vulnerable. However, Colombian populations could represent a source of immigrants, as there are no major geographic or deforestation barriers to impede this<sup>30</sup>. Likewise, the species appears fairly tolerant of habitat modification, persisting in secondary forest and forest edge. This, coupled with a moderate degree of protection, including known populations within large protected areas (e.g., Cayambe-Coca, El Ángel, and Illinizas Ecological Reserves), might suggest that Ecuadorian populations are stable or only experiencing a slow decline.

Taxonomic status is still controversial<sup>23</sup>. Vocal differences between *M. colombianus* and *M. ingens* are subtle, less marked than between populations referred to nominate *ingens*<sup>15,17</sup> (N. Krabbe unpubl.) and a thorough analysis might demonstrate that *M. colombianus* does not merit species status (N. Krabbe *in litt.* 2011).

Table 1. New localities for rare, poorly known and threatened screech and pygmy owls in Ecuador. Habitat: primary forest (PF), primary forest edge (PFE), secondary forest (SF), secondary forest edge (SFE), forest edge (FE), forest fragments (FF). Record: tape-recorded (T), heard (H), seen (S), specimen (M).

Species	Locality	Province	Coordinates	Elevation	Habitat	Record
<i>Megascops ingens</i>	15 km E of Chontayacu	Tungurahua	01°16'S 78°09'W	1,614 m	PF	T
	Nueva Alianza	Morona-Santiago	02°05'S 78°09'W	1,500 m	PFE	H
	9 de Octubre	Morona-Santiago	02°13'S 78°14'W	1,740 m	FF	H
	Sardinayaku	Morona-Santiago	02°04'S 78°12'W	1,774 m	PF	T
<i>Megascops colombianus</i>	Tiquibuzo	Bolívar	02°01'S 79°08'W	2,400 m	SF	T
	San Vicente	Bolívar	01°55'S 79°08'W	1,890 m	FF	T
<i>Megascops petersoni</i>	15 km E of Chontayacu	Tungurahua	01°16'S 78°09'W	1,614 m	PF	T
	Warintz, Cordillera Kenkuim	Morona-Santiago	03°12'S 78°25'W	1,738 m	PF	M
	Leonidas Plaza	Morona-Santiago	02°59'S 78°19'W	1,592 m	PF	M
	Huambi, Cordillera Kutukú	Morona-Santiago	02°33'S 78°09'W	1,234 m	SF	T
<i>Megascops guatemalae napensis</i>	Las Orquídeas	Zamora-Chinchi	04°25'S 78°67'W	1,350–1,500 m	PF	T
	El Paraíso, 20 km S of Puyo	Pastaza	01°46'S 77°09'W	950 m	SFE	H
	Guamote–Macas road	Morona-Santiago	02°13'S 78°07'W	1,150 m	FE	H
	Cordillera Domono	Morona-Santiago	02°19'S 78°07'W	982 m	PF	T
	Yayu, Cerro Guayusa	Zamora-Chinchi	02°33'S 77°53'W	1,030 m	PF	M
<i>Megascops guatemalae 'centralis'</i>	Las Orquídeas	Zamora-Chinchi	04°25' S 78°67' W	1,450 m	PF	T
	Molleturo–Mullopungo	Azuay	03°13'S 79°38'W	1,577 m	SF	H
	Paccha	El Oro	03°29'S 79°43'W	809 m	FE	T
	Paccha	El Oro	03°30'S 79°43'W	1,163 m	FE	T
	Sambo Tambo	El Oro	03°38'S 79°43'W	1,750 m	FF	T
	Ñalacapac	El Oro	03°41'S 79°45'W	895 m	FF	T
<i>Glauclidium nubicola</i>	Palosolo	El Oro	03°72'S 79°83'W	1,250 m	FE	T
	Mashpi reserve	Pichincha	00°16'N 79°94'W	1,200 m	PF	H
<i>Glauclidium parkeri</i>	Wambula, Colonso forest	Napo	00° 89'S 77°86'W	1,000 m	PF	H
	15 km E of Chontayacu	Tungurahua	01°16'S 78°09'W	1,614 m	PF	S
	San Luis de Iñinques	Morona Santiago	02°23'S 78°02'W	1,450 m	PFE	H
	Las Orquídeas	Zamora-Chinchi	04°25'S 78°67'W	1,350 m	PF	T
<i>Glauclidium griseiceps</i>	La Sabalera	Carchi	00°58'N 78°30'W	600 m	PF	S
	río Bogotá, Awacachi reserve	Esmeraldas	01°05'N 78°41'W	44 m	PF	T
	Tundaloma	Esmeraldas	01°11'N 78°40'W	100 m	SF	T
	10 km W of Pto. Quito	Pichincha	00°18'N 79°30'W	355 m	SF	T

### Cloud-forest Pygmy Owl *Glauclidium nubicola*

This recently described species<sup>28</sup> has a rather similar distribution to *M. colombianus*, being also endemic to the Andean portion of the Chocó<sup>2</sup>. Its range extends from Risaralda, Colombia, to northern Cotopaxi, with a seemingly isolated population in south-west El Oro<sup>9</sup> (Fig. 2).

During our field work we visited 13 localities within its presumed range, but it was detected at just three (Santa Lucía and Mashpi reserves, Pichincha, and Chical, Carchi). It should be noted that previous records from localities close to Santa Lucía and Chical make our record at Mashpi the only addition to what was already known of the species' distribution in Ecuador<sup>9</sup>. Mashpi (1,200 m) represents its lowest altitudinal record, along with

an unpublished report from Milpe Bird Sanctuary (1,100 m; P. J. Greenfield *in litt.* 2012) as it was previously reported to 1,400 m in the north-west<sup>26</sup>.

The modelled distribution of *G. nubicola* predicts a continuous distribution south to southern Cotopaxi, and again along the Pacific slope in Azuay, El Oro and Loja, comprising 3,834 km<sup>2</sup> (Fig. 2a) (*contra* Ridgely & Greenfield<sup>26</sup>). However, there are no actual records from Azuay or Loja, and just one in Carchi, one in Cotopaxi and a recent one (February 2012) in Imbabura (Los Cedros Reserve; JFF unpubl.). Constraining the distribution according to current deforestation resulted in 2,570 km<sup>2</sup> (33% of range lost) (Fig. 2b); c.990 km<sup>2</sup> (39%) of its current Extent of Occurrence is protected (Fig. 2c). Nonetheless, there are no confirmed

records from state-run protected areas (Cotacachi-Cayapas and Illinizas Ecological Reserves), despite the existence of apparently suitable habitat.

This species' responsiveness to playback is apparently low and might partially explain the lack of records from potentially appropriate habitat, including extensively forested areas within reserves. For instance, field work at Chical, where specimens were collected in 1988<sup>28</sup> resulted in a single encounter during four evening surveys. Notably, passerines and hummingbirds reacted on several occasions to playback of *G. nubicola* vocalisations<sup>25</sup>. Likewise, at Santa Lucía the species responded and approached one afternoon and at dusk (within a presumed territory), but not the previous day at another creek at the same site. Response is therefore comparatively weak compared to some congeners (e.g., Pacific Pygmy Owl *G. peruanum*; JFF pers. obs.).

The species is currently ranked Vulnerable globally owing to severe ongoing deforestation within its reduced global range<sup>2</sup>. Likewise, it is ranked Vulnerable in Colombia<sup>24</sup> whilst Freile *et al.*<sup>9</sup> also suggested Vulnerable status in Ecuador. Our assessment of the species' current conservation status suggests it faces a rather gloomy future in the country. A population decline >30% over the last or during the next ten years or three generations can be inferred based on 33% range loss, although a more conservative approach suggests lower rates of decline. Therefore, it meets criteria A2c and A3c for Vulnerable. With low population density and less than 55% remaining range in Colombia<sup>25</sup>, immigration appears unlikely. Further, its current Extent of Occurrence is smaller than 5,000 km<sup>2</sup>, can be considered fragmented and in continuous decline, meeting the Endangered category for criterion B1a,b. BirdLife International<sup>2</sup> suggested that declines are slow, but the few records, rate of habitat loss and apparently low population densities should be taken into account when assessing its population. The species benefits little from existing conservation units, with no records from large protected areas, leading us to suggest a re-assessment of its global status.

### Concluding remarks

Research on nightbirds, from presence / absence surveys to population assessments or natural history studies, has been unduly neglected by Neotropical ornithologists, excepting some important research in Mexico, Argentina and Chile<sup>7</sup>. Nonetheless, it is widely recognised that increased knowledge of a species' ecology and distribution yields a better understanding of their vulnerability to extinction.

Current trends of habitat loss throughout the Ecuadorian Andes and the western lowlands<sup>21</sup> are provoking population declines even of species

not yet ranked as threatened or Near Threatened (e.g., *M. roboratus*, *G. griseiceps*). *Megascops colombianus* and *Glaucidium nubicola* are among the most range-restricted owls in mainland South America<sup>17</sup>. Although some extensive tracts of potentially suitable forest remain within the large Cotacachi-Cayapas Ecological Reserve, habitat loss outside protected areas is rampant. Smaller private reserves contribute to species conservation, and provide the only protected sites where *G. nubicola* has been recorded (e.g., Maquipucuna, Otonga, Bellavista, Santa Lucia, Mashpi, Milpe reserves).

This study is part of a larger project (the Cuscungo Initiative) to investigate and document the natural history, distribution and status of nocturnal birds in Ecuador, as well as human perceptions about them. Current work includes an assessment of populations and habitat use of four owls in an Andean dry forest; a survey of the distribution and conservation of Buff-fronted Owl *Aegolius harrisi*; natural history observations of subtropical species; and a study of how people perceive nightbirds. Owl research in Ecuador is only beginning<sup>10</sup>. The Cuscungo Initiative is open to new proposals, volunteering or any other type of collaboration from the Neotropical ornithology and birding communities.

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