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DESCRIPTION OF TWENTY FOUR NEW SUBSPECIES OF AMERICAN *OTUS* (AVES, STRIGIDAE)

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ABSTRACT

This paper gives a summary of the results of a comprehensive revision of the American species of the genus *Otus* Pennant, 1769, contained in a thesis presented at the Free University, Amsterdam. A checklist of American *Otus* is given, comparing the revised classification with that of Peters (1940). Twenty four new subspecies proposed in the thesis are validated herewith.

INTRODUCTION

The last complete revision of the genus *Otus* Pennant, 1769, was given by Peters (1940). Many new discoveries were described since, and a new revision was long overdue. A general review of the species of *Otus* appeared some years ago (Hekstra, 1973), however, without giving subspecific details, as it served mainly to inform a broad public about the general appearance, variation and distribution of the Scops and Screech Owls. For my own convenience I decided to pursue my revision of the genus *Otus* in portions, starting with the American species. The results were presented in the form of a thesis at the Free University of Amsterdam (Hekstra, 1982)[1].

That revision deals with 16 species and 110 subspecies of which 24 are indicated as new subspecies. The purpose of this paper is the validation of these new subspecies by formal publication.

[1]) Copies of the thesis can be ordered directly from the author.

SCOPE OF THE REVISION

For each of the 16 species an introduction to their taxonomy, structure and features, measurements, geographical variation, voice and habitat is given. Approximately 2600 specimens in 45 museums have been investigated. After an introduction to the problems involved (chapter 1), the methods, materials and the museums visited are listed with the date of the last visit (chapter 2). In chapter 3 an attempt to a definition of the genus and of five subgenera is made. The occurrence of colour morphs is discussed in chapter 4. Chapter 5 deals with species problems, in particular with superspecies and related problems. Chapter 6 serves to discuss ecological differentiation and distributional radiations. It is concluded that there appear to be hitherto uncolonized niches, which raise the question whether these are indications of a relatively young species radiation. Distributional maps are added, which reflect likely ranges before the great deforestations and habitat changes of the last century took place.

Many details are summarized in tables. Table I gives the climatic zone for each subspecies. Table II shows cross-sections in ten mountainous areas to illustrate the zonal and horizontal distribution of the local races. Table III depicts the wing formulas, showing the most important geographical variation. Table IV gives maximum, minimum and average lengths of wing, tail, tail/wing index, tarsus, mid-toe, bill and tufts for each subspecies, The list of references is kept short by not repeating literature quoted in Peters' Checklist (1940).

RESULTS OF THE REVISION

In my revision the following details are new:

a) Widening the genus limits and recognising subgenera for systematic rather than nomenclatorial purposes (chapter 3).

b) Recognition of several superspecies at different stages of species differentiation and geographical background (chapter 5).

c) Recognition of 16 species of American *Otus* as opposed to 17 by Peters, but as three (*O. lambi*, *O. marshalli* and *O. seductus*) were not known in 1940, the original 17 are re-arranged into 14 by merging the following species together:

- *O. minimus* and *O. clarkii* with *O. ingens*,
- *O. watsonii* with *O. atricapillus*,
- *O. roboratus* with *O. choliba;*

and splitting:

- *O. asio* in *O. asio* and *O. kennicotti*.

d) Transferring some races to another species:

- *aequatorialis* from *O. albogularis* to *O. ingens*,
- *huberi* from *O. watsonii* to *O. guatemalae*.

e) Recognition of subspecies groups (sufficiently isolated to become potentially, sooner or later, an "incipient species"); and of series (a number of subspecies to be regarded as a section of clinal variation, but not sufficiently isolated to become, potentially, an "incipient species").

f) Restoration of a few older names.

g) Proposal of several new subspecies, many of which are intended to draw attention to hitherto overlooked or unknown geographical variation.

The following names, published prior to 1940 and not listed by Peters, are recognised as valid taxa or synonyms (in chronological order and with numbers referring to the checklist):

- *carolinensis (= O. asio asio)* 9.5

  Asio scops carolinensis Brisson, 1760, Orn., I: 497.

- *portoricensis (= O. choliba portoricensis)* 11.12

  Scops portoricensis Lesson, 1831, Traité d'Orn., I: 107.

- *lophotes (= O. atricapillus lophotes)* 14.2

  Scops lophotes Lesson, 1831, Traité d'Orn., I: 107; priority over *watsonii* Cassin, 1848.

- *macabrum (= O. albogularis macabrum)* 16.4

  Syrnium macabrum Bonaparte, 1850, Consp. Avium, I: 53.

- *argentinus (= O. atricapillus argentinus)* 14.8

  Ephialtes argentina Lichtenstein, 1854, Nomencl. Mus. Berol.: 7.

- *ocreatus (= O. asio ocreatus)* 9.2

  Ephialtes ocreata Lichtenstein, 1854, Nomencl. Mus. Berol.: 7.

- *enano (= O. trichopsis trichopsis)* 5.6

  Scops asio enano Ridgway, 1873, Bull. Essex Inst., 5: 200.

- *krugii (= O. nudipes krugii)* 4.3

  Gymnoglaux krugii Gundlach, 1874, Journ. f. Orn., 22: 310 (315).

- *idahoensis (= O. flammeolus idahoensis)* 1.4

  Megascops flammeolus idahoensis Merriam, 1891, North Am. Fauna, 5: 96, pl. 1.

- *ridgwayi (= O. trichopsis ridgwayi)* 5.5

  Megascops ridgwayi Nelson & Palmer, 1894, Auk, 11: 40.

- *semplei (= O. asio semplei)* 9.3

Otus asio semplei Sutton & Burleigh, 1939, Auk, 56: 174.

The following names, published in or after 1940, are recognised as valid taxa or synonyms (in chronological order):

- *helleri (= O. guatemalae helleri)* 3.14

  Otus guatemalae helleri Kelso, 1940, Biol. Leaflet, 12: 1.

- *suttoni (= O. kennicotti suttoni)* 10.9

  Otus asio suttoni Moore, 1941, Proc. biol. Soc. Wash., 54: 154.

- *sortilegus (= O. kennicotti sortilegus)* 10.6

  Otus asio sortilegus Moore, 1941, Proc. biol. Soc. Wash., 54: 155.

- *seductus (= O. seductus)* 13.1

  Otus vinaceus seductus Moore 1941, Proc. biol. Soc. Wash., 54: 156.

- *surutus (= O. choliba surutus)* 11.5

  Otus choliba surutus Kelso, 1941, Biol. Leaflet, 13: 1.

- *bolivianus (= O. guatemalae bolivianus)* 3.14

  Otus guatemalae bolivianus Bond & De Schauensee, 1941, Notulae Naturae, 93: 2.

- *remotus (= O. albogularis remotus)* 16.5

  Otus albogularis remotus Bond & De Schauensee, 1941, Notulae Naturae, 93: 3.

- *portoricensis (= O. choliba kelsoi)* 11.18

  Otus choliba portoricensis Kelso, 1942, Biol. Leaflet, 14: 2.

- *chiapensis (= O. cooperi chiapensis)* 12.2

  Otus cooperi chiapensis Moore, 1947, Proc. biol. Soc. Wash., 60: 13.

- *yumanensis (= O. kennicotti gilmani)* 10.5

  Otus yumanensis Miller & Miller, 1951, Condor, 53: 17.

CHECKLIST OF AMERICAN *OTUS*

Names of authors are given only for taxa not mentioned by Peters.

	Revised classification (Hekstra, 1982)	Peters' Check-list (1940)
A.	SCOPS OWLS (Subgenus *Scops*; partim)	
1.	*Otus flammeolus* (Flammulated Scops Owl)	
a.	flammeolus group	
1.1	*O. f. meridionalis* n.ssp.	
1.2	*O. f. flammeolus*	*O. flammeolus flammeolus*
b.	idahoensis group	
1.3	*O. f. frontalis* n.ssp.	
1.4	*O. f. idahoensis* (Merriam, 1891)	
1.5	*O. f. borealis* n.ssp.	
1.6	*O. f. rarus*	*O. flammeolus rarus*
B.	BARE-LEGGED SCREECH OWLS (subgenus *Gymnoglaux*)	
2.	*Otus lawrencii* (Bare-legged or Cuban Screech Owl)	
2.1	*O. l. lawrencii*	*Gymnoglaux lawrencii lawrencii*
2.2	*O. l. exsul*	*Gymnoglaux lawrencii exsul*
C.	SCREECH OWLS (subgenus *Megascops*)	
C.I.	VERMICULATED SCREECH OWLS (superspecies *O.* [*guatemalae*]: *O. guatemalae*, *O. nudipes*)	
3.	*Otus guatemalae* (Vermiculated Screech Owl)	
a.	cassini group	
3.1	*O. g. pettingilli* n.ssp.	

3.2	*O. g. cassini*	*O. guatemalae cassini*
b.	hastatus group	
3.3	*O. g. hastatus*	*O. guatemalae hastatus*
3.4	*O. g. tomlini*	*O. guatemalae tomlini*
c.	guatemalae group	
3.5	*O. g. thompsoni*	*O. guatemalae thompsoni*
3.6	*O. g. marmoratus*	*O. guatemalae guatemalae* (partim)
3.7	*O. g. fuscus*	*O. guatemalae fuscus*
3.8	*O. g. peteni* n.ssp.	
3.9	*O. g. guatemalae*	*O. guatemalae guatemalae*
3.10	*O. g. dacrysistactus*	*O. guatemalae dacrysistactus*
d.	vermiculatus group	
3.11	*O. g. vermiculatus*	*O. guatemalae vermiculatus*
3.12	*O. g. centralis* n.ssp.	
3.13	*O. g. napensis*	*O. guatemalae napensis*
3.14	*O. g. helleri* Kelso, 1940 (incl. *O. g. bolivianus* Bond & De Schauensee, 1941)	
3.15	*O. g. huberi*	*O. watsonii watsonii* (partim)
3.16	*O. g. pallidus* n.ssp.	
e.	roraimae group	
3.17	*O. g. roraimae*	*O. guatemalae roraimae*
f.	pacificus group	
3.18	*O. g. pacificus* n.ssp.	
3.19	*O. g. rufus* n.ssp.	
4.	*Otus nudipes* (Puerto Rican or Bare-legged Vermiculated Screech Owl)	
4.1	*O. n. nudipes*	*O. nudipes nudipes*
4.2	*O. n. newtoni*	*O. nudipes newtoni*
4.3	*O. n. krugii* (Gundlach, 1874)	
C.II	SPOTTED SCREECH OWLS (superspecies *O.* [*trichopsis*]: *O. trichopsis, O. barbarus, O. marshalli*)	
5.	*Otus trichopsis* (Spotted Screech Owl)	
a.	mesamericanus group	
5.1	*O. t. inexpectus* n.ssp.	
5.2	*O. t. pumilus*	*O. trichopsis pumilus*
5.3	*O. t. mesamericanus*	*O. trichopsis mesamericanus*
b.	trichopsis group	
5.4	*O. t. guerrerensis*	*O. trichopsis guerrerensis*
5.5	*O. t. ridgwayi* Nelson & Palmer, 1894	
5.6	*O. t. trichopsis* incl. *Scops asio enano* Ridgway, 1873	*O. trichopsis trichopsis*
5.7	*O. t. aspersus* incl. *Megascops pinosus*	*O. trichopsis aspersus* *O. trichopsis pinosus*
6.	*Otus barbarus* (Santa Barbara Spotted Screech Owl)	
6.1	*O. barbarus*	*O. barbarus*
7.	*Otus marshalli* (Cloud-forest Spotted Screech Owl)	
7.1	*O. marshalli* Weske & Terborgh, 1981	

C.III COMMON SCREECH OWLS
(superspecies *O. [asio]: O. lambi, O. asio, O. kennicotti*)

8.	*Otus lambi* (Lamb's Common Screech Owl)	
8.1	*O. lambi* Moore & Marshall, 1959	
9.	*O. asio* (Eastern Common Screech Owl)	
a.	series floridanus	
9.1	*O. a. floridanus*	*O. asio floridanus*
9.2	*O. a. ocreatus* Lichtenstein, 1862	
b.	series asio	
9.3	*O. a. semplei* Sutton & Burleigh, 1939	
9.4	*O. a. mccallii*	*O. asio mccallii*
9.5	*O. a. asio*	*O. asio asio*
	incl. *Asio scops carolinensis* Brisson, 1760	
c.	series naevius	
9.6	*O. a. naevius*	*O. asio naevius*
9.7	*O. a. hasbroucki*	*O. asio hasbroucki*
9.8	*O. a. swenki*	*O. asio swenki*
9.9	*O. a. maxwelliae*	*O. asio maxwelliae*
10.	*Otus kennicotti* (Western Common Screech Owls)	
a.	vinaceus group	
10.1	*O. k. xantusi*	*O. asio xantusi*
10.2	*O. k. cardonensis*	*O. asio cardonensis*
10.3	*O. k. sinaloensis*	*O. asio sinaloensis*
10.4	*O. k. vinaceus*	*O. asio vinaceus*
10.5	*O. k. gilmani*	*O. asio gilmani*
	incl. *O. asio yumanensis* Miller & Miller, 1951	
10.6	*O. k. sortilegus* Moore, 1941	
10.7	*O. k. quercinus*	*O. asio quercinus*
10.8	*O. k. bendirei*	*O. asio bendirei*
b.	cineraceus group	
10.9	*O. k. suttoni* Moore, 1941	
10.10	*O. k. cineraceus*	*O. asio cineraceus*
10.11	*O. k. inyoensis*	*O. asio inyoensis*
10.12	*O. k. clazus*	*O. asio clazus*
10.13	*O. k. aikeni*	*O. asio aikeni*
10.14	*O. k. mychophilus*	*O. asio mychophilus*
10.15	*O. k. macfarlanei*	*O. asio macfarlanei*
c.	kennicotti group	
10.16	*O. k. saturatus*	*O. asio kennicotti* (partim)
10.17	*O. k. brewsteri*	*O. asio brewsteri*
10.18	*O. k. kennicotti*	*O. asio kennicotti*

C.IV SAVANNAH SCREECH OWLS
(superspecies *Otus [choliba]: O. choliba, O. cooperi, O. seductus*)

11.	*Otus choliba* (Choliba Screech Owl)	
a.	choliba group	
11.1	*O. ch. caatingensis* n.ssp.	

11.2	*O. ch. decussatus*	*O. choliba decussatus*
11.3	*O. ch. chapadensis* n.ssp.	
11.4	*O. ch. wetmorei*	*O. choliba wetmorei*
11.5	*O. ch. surutus* Kelso, 1941	
11.6	*O. ch. choliba*	*O. choliba choliba*
11.7	*O. ch. urùguaii* n.ssp.	
11.8	*O. ch. alilucuco* n.ssp.	
11.9	*O. ch. koepckei* n.ssp.	
11.10	*O. ch. alticolus*	*O. choliba alticola*
11.11	*O. ch. caucae* n.ssp.	
11.12	*O. ch. portoricensis* (Lesson, 1831)	
11.13	*O. ch. luctisonus*	*O. choliba luctisonus*
11.14	*O. ch. duidae*	*O. choliba duidae*
11.15	*O. ch. guyanensis* n.ssp.	
11.16	*O. ch. montanus* n.ssp.	
11.17	*O. ch. crucigerus*	*O. choliba crucigerus*
11.18	*O. ch. kelsoi* n.ssp.	
	(replaces *O. ch. portoricensis* Kelso, 1942)	
11.19	*O. ch. margaritae*	*O. choliba margaritae*
b.	roboratus group	
11.20	*O. ch. roboratus*	*O. roboratus*
12.	*Otus cooperi* (Cooper's Screech Owl)	
12.1	*O. co. cooperi*	*O. cooperi*
12.2	*O. co. chiapensis* Moore, 1947	
13.	*Otus seductus* (Balsas Screech Owl)	
13.1	*O. sed. seductus*	
	(*O. vinaceus seductus* Moore, 1941)	
13.2	*O. sed. colimensis* n.ssp.	

C.V BLACK-CAPPED SCREECH OWL

14.	*Otus atricapillus* (Black-capped Screech Owl)	
a.	lophotes group	
14.1	*O. atr. ater* n.ssp.	
14.2	*O. atr. lophotes* (Lesson, 1831)	
	incl. *O. watsonii*	*O. watsonii watsonii*
14.3	*O. atr. morelius* n.ssp.	
14.4	*O. atr. inambarii* n.ssp.	
14.5	*O. atr. ustus*	*O. watsonii usta*
14.6	*O. atr. fulvescens* n.ssp.	
b.	atricapillus group	
14.7	*O. atr. atricapillus*	*O. atricapillus*
14.8	*O. atr. argentinus* (Lichtenstein, 1854)	
	incl. *O. choliba pintoi*	*O. atricapillus* (partim)
c.	sanctaecatarinae group	
14.9	*O. atr. sanctaecatarinae*	*O. atricapillus* (partim)
	incl. *O. choliba maximus*	*O. atricapillus* (partim)

C.VI RUFESCENT SCREECH OWLS

15.	*Otus ingens* (Rufescent Screech Owl)	
a.	ingens group	
15.1	*O. i. minimus*	*O. minimus*
15.2	*O. i. ingens*	*O. ingens*
	incl. *Ciccaba aequatorialis*	*O. albogularis aequatorialis*
15.3	*O. i. venezuelanus* Phelps & Phelps, 1954	
b.	clarkii group	
15.4	*O. i. colombianus* Traylor, 1952	
15.5	*O. i. clarkii*	*O. clarkii*

D. WHITE-THROATED SCREECH OWLS (subgenus *Macabra*)

16.	*Otus albogularis* (White-throated Screech Owl)	
16.1	*O. alb. obscurus* Phelps & Phelps, 1953	
16.2	*O. alb. meridensis*	*O. albogularis meridensis*
16.3	*O. alb. albogularis*	*O. albogularis albo-gularis*
16.4	*O. alb. macabrum* (Bonaparte, 1850)	
16.5	*O. alb. remotus* Bond & De Schauensee, 1941	

DESCRIPTIONS OF 24 NEW SUBSPECIES

The numbers under the names refer to the place in the checklist.

Abbreviations used:

AMNH	American Museum of Natural History, New York, N.Y., U.S.A.
ANSPh	Academy of Natural Sciences, Philadelphia, Penn., U.S.A.
BMNH	British Museum (Natural History), London, U.K.
ChiMNH	Chicago Museum of Natural History, Chicago, Ill., U.S.A.
CMP	Carnegie Museum, Pittsburgh, Penn., U.S.A.
DenMNH	Denver Museum of Natural History, Denver, Col., U.S.A.
KCP	Koepcke Collection, Lima, Peru.
LACM	Los Angeles County Museum, Los Angeles, Cal., U.S.A.
LSUMZ	Louisiana State Univerity, Muséum of Zoology, Baton Rouge, La., U.S.A.
MAKB	Museum Alexander Koenig, Bonn, FRG.
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Mass., U.S.A.
MHNGen	Muséum d'Histoire Naturelle, Genève, Switzerland.
MHNPar	Muséum National d'Histoire Naturelle, Paris, France.
NHMBas	Naturhistorisches Museum, Basel, Switzerland.
NHMWien	Naturhistorisches Museum, Wien, Austria.
NHRMSt	Naturhistoriska Riksmuseet, Stockholm, Sweden.
RMNHL	Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.
SenckMF	Senckenberg Museum, Frankfurt, FRG.
SMNStut	Staatliches Museum für Naturkunde, Stuttgart, FRG.
UCalMVZ	University of California, Museum of Vertebrate Zoology, Berkeley, Cal., U.S.A.
UKansMNH	University of Kansas, Museum of Natural History, Lawrence, Kansas, U.S.A.
UMichMZ	University of Michigan, Museum of Zoology, Ann Arbor, Mich., U.S.A.
USNM	United States National Museum, Washington, D.C., U.S.A.
UWiscZM	University of Wisconsin, Zoological Museum, Madison, Wisconsin, U.S.A.
YalePM	Yale Peadbody Museum, New Haven, Conn., U.S.A.
ZMBerl	Zoologisches Museum, Berlin, FRG.
ZMHamb	Zoologisches Museum, Hamburg, FRG.
ZMKøb	Zoologisk Museum, København, Denmark.
ZSBSM	Zoologische Sammlung des Bayrischen Staates, München, FRG.

Otus flammeolus meridionalis new subsp.

(1.1)

Type.-

UCalMVZ 10978, male adult, 25 Aug. 1938, Cuapongo, Guerrero, Mexico; wing 127 mm; collected by W.W. Brown.

Distribution and habitat.-
Guatemala and Southern Sierra Madre; breeding above 6000 feet.

Diagnosis.-

Rufous parts more brilliantly red and grey parts with glossier black markings than *flammeolus*; smaller and glossier than *rarus* (winter visitors).

Additional specimens examined.-
Guatemala: 1 Tecpam in ChiMNH (Jan.), 2 Tecpam, Chichavak (= Chicuac) in DenMNH (Dec.); wings 129-133 mm; Guerrero: 3 Cuapongo (Aug.), and 1 Chilpancingo (Dec.) in UCalMVZ by Brown; wings 127-136 mm.

Derivation of name.-
meridionalis: the most southerly of its species.

Otus flammeolus frontalis new subsp.
(1.3)

Type.-
USNM 119630, breeding female, Estes Park, Front Range, Colorado, 20 June 1890, wing 141 mm; collected by W.G. Smith. One year later Smith collected a very similar breeding female at the same place (USNM 124426), paratype.

Distribution and habitat.-
Eastern Rocky Mountains, Front Range, Colorado; not yet known in Wyoming, elevations up to 8000 feet in Canadian and transition zones. Probably migrating in winter to central Mexico via western Texas.

Diagnosis.-

Generally much darker than *flammeolus* red parts almost dark chestnut brown; upper parts with very black shaft streaks and vermiculations.

Additional specimens examined.-
5 Colorado, Front Range at Estes Park, Boulder (MCZ 133016), Beulah (BMNH 98.7.12.288), West Creek (DenMNH 33698), 1 New Mexico, Rio Arribas, 14 miles W. of Tres Piedras (USNM 242466); wings 135-142 mm. Migration is suggested by specimen USNM 141213, Texas nr. Presidio, 19 Aug. 1890, wing 144.5 mm, closely resembling *frontalis* type.

Derivation of name.-
frontalis: from the Front Range, Colorado, USA.

Otus flammeolus borealis new subsp.
(1.5)

Type.-
UCalMVZ 10.700, female adult, Penticton, Okanagan Valley, British Columbia, on lake shore, 22 Oct. 1901; wing 142 mm; collected by Allan Brooks.

Distribution and habitat.-
East of the Cascade Range from N.E. California through central Oregon (west of line from Lake View to the Blue Mountains), all of the Columbia Basin (Washington and northern Idaho and interior of British Columbia, at least as far as Kamloops, but possibly including most or all of the Fraser River Valley; elevations 4000-7000 feet, Canadian Zone.

Diagnosis.-

On average slightly larger than *idahoensis* and with less white, duller grey underground, darker vermiculations and markings, and less warm red and brown on facial disc, neck and scapulars. Differs from *rarus* in having red, brown and ochre colouring duller and less bright.

Additional specimens examined.-
N. California: 8 Sierra Co., 2 Lassen Co., 2 Modoc Co. and 1 Washoe Co. nr. Crystal Bay, all in UCalMVZ, and 1 at Fort Crook (in USNM); wings 136-147 mm; Oregon: 1 Homestead (in USNM) and 1 Umatilla and 5 at Sisters (in UCalMVZ); wings 139.5-142 mm; Washington: 2 Mt. Aix (in LSUMZ), 1 Pasco (in USNM) and 4 Stayawhile Spring (in UCalMVZ); wings 137-145.5 mm; Br-Col.: 1 Penticton (type) and 1 Kamloops (not seen). Specimens collected in winter, resembling *borealis* are 3 in BMNH from Valley of Mexico and Oaxaca, and 2 in LSUMZ from Cerro Campanazio, San Luis Potosi, and nr. Morelia, Michoacan. Furthermore, there is one very interesting specimen (LSUMZ 13221) collected 2 Jan. 1949 in Baton Rouge, Louisiana, closely resembling the one from Mt. Aix, Wash.; it was found with an injured left wing, and that is the likely reason for deviation from it's migration route to Mexico - provided the specimen really belongs to the *borealis* population, for which there is no proof; wing 141 mm.

Derivation of name.-
borealis: the most northerly of its species.

Otus guatemalae pettingilli new subsp.
(3.1)

Type.-
Otus guatemalae pettingilli "G.M. Sutton, 1949" (manuscript name). (Tamaulipas, Mexico, above Rio Savinas near Gomez Farias, female, 11 Apr. 1941, collected by O.S. Pettingill Jr.; depicted in J.T. Marshall, Mon. Western Found. Vert. Zool.; July 1967, specimen at the top of pages 66-67).

Distribution and habitat.-
San Luis Potosi and Tamaulipas in foot-hill tropical wood of oak-sweetgum up to temperate zone (7000 feet).

Diagnosis.-

Resembling *O. trichopsis* even more than *cassini*, but toes entirely naked. Smaller and darker than *cassini*, greyer on upper parts and the "hastate" vermiculations on under parts more reduced, making the general appearance more like *O. trichopsis*. Inner webs of primaries as *cassini*, with strongly reduced bars and spots, resembling *O. trichopsis* and *O. barbarus*. Tarsi well feathered to joint of toes.

Additional specimens examined.-
1 San Luis Potosi: 1 Llano de Garzas (7000 ft) and 1 Llano de la Cruce (6200 ft), Cerro Coneja Region, both in LSUMZ; wings 140.5-150.5 mm); Tamaulipas: 1 near Gomez Farias (type specimen) not measured.

Derivation of name.-
pettingilli: from a manuscript name on a label (by Griscom ?).

Otus guatemalae peteni new subsp.
(3.8)

Type.-
UMichMZ 137395, female adult, 18 Apr. 1920, Laguna Perida, Peten, Guatemala, collected by P.N. Shufeldt; red morph; contained a fully formed egg in the oviduct.

Distribution and habitat.-
Wet forests of northern Guatemala, Belize and southern Quintana Roo; possibly also in adjacent parts of Chiapas and Campeche, Mexico.

Diagnosis.-

Both morphs more red-brown than *marmoratus* and *guatemalae*. The brown morph is similar to what Sharpe described as the red morph of *guatemalae*, and is about as brown as *vermiculatus* but with less fine vermiculations. The red morph is a deeper warm red-brown than the brown morph. Lower 1-4 mm of tarsi bare.

Additional specimens examined.-
In addition to the type, specimens from Lake Tikal (in MCZ) and from La Libertad, Tayabaj Quiche and Chuntuqui (in USNM) and from Chetumal (in UKansMNH) are regarded as *peteni*; 7 specimens; wings 159.5-178 mm.

Derivation of name.-
peteni: from Lake Peten, Guatemala.

Otus guatemalae centralis new subsp.
(3.11)

Type.-
USNM 484980, female adult, Cerro Mali, 4100 feet, Darien, Panama, 14 Feb. 1964, dark morph, collected by C.O. Handley in a mist net in evergreen forest; wing 159 mm.

Distribution and habitat.-
Panama east of Chiriqui through Darien into Serrania de Baudo (Colombia); perhaps also in adjacent north-western Colombia (Cordoba, Bolivar, Magdalena); not on Pacific side of Western Panama.

Diagnosis.-

Intermediate in appearance between *vermiculatus* and *guatemalae*. All measurements similar to *vermiculatus*, but the plumage pattern is more similar to *guatemalae* with coarse streaks, bars and patches, and more reduced vermiculations. Brighter colours than in *pallidus*. Tarsi bare for less than lower quarter.

Additional specimens examined.-
Western Panama: 1 Bocas del Toro; Eastern Panama: 1 Colon, 1 Upper Trinidad, 1 La Laguna, 2 Cana, 1 Cerro Mali; Colombia: 1 Alto del Buey (Baudo); wings 159-168 mm. Specimens in AMNH, ANSPh, BMNH, MCZ, RMNHL, USMN and ZMBerl.

Derivation of name.-
centralis: because it has a central place in the distribution of its species.

Otus guatemalae pallidus new subsp.
(3.16)

Type.-
AMNH 476699, Andes de Cumana, Northern Venezuela, adult, sex unknown, red morph, March 1897, ex Museo Delmas, wing 167 mm.

Distribution and habitat.-
Northern Venezuela in coastal Andes mountains from Puerto Cabello to Peninsula Paria; also to be expected in the Sierra de Perija of northern Colombia.

Diagnosis.-

Much less red-brown than *huberi*. Resembling *guatemalae* in both morphs, but coloration averaging paler brown. Tarsi fully feathered.

Additional specimens examined.-
Specimens collected between Peninsula Paria and Puerto Cabello in northern Venezuela: 3 in AMNH; 2 in ChiNMH; 1 in BMNH; 1 in SenckMF; wings 163-174 mm.

Derivation of name.-
pallidus: has a pale appearance.

Otus guatemalae pacificus new subsp.
(3.18)

Type.-
BMNH 023.13.1564, female adult, 27 Aug. 1899, Morropon 140 m, Piura NW Peru; grey morph, wing 150 mm; collected by P.O. Simons.

Distribution and habitat.-
Pacific lowlands of Northern Peru from around Sullana (dept. Piura) probably as far south as the coast of the dept. La Libertad where the same climate and vegetation occur (foliaged woodland, 3900-6500 ft. according to Maria Koepcke).

Diagnosis.-
Much smaller than adjacent *napensis*, nuchal and cervical collars (hind neck) more distinctly contrasting with plumage of head and back; facial rim more distinct, face less red or rufous; inner webs of primaries less distinctly barred. In all these respects slightly resembling *O. trichopsis*, particularly *mesamericanus*. Also resembles *cassini*, but plumage pattern on under parts less "hastate" vermiculated.

Additional specimens examined.-
AMNH 175093, Piura, Palambla 3900-6500 ft., 22 Sept. 1922 by Watkins; ChiNHM 123996, Piura, Amotape Mts., 23 Feb. 1944 by Sandborn; NHMBas 13279, Piura, Sullana, Mallares Angolito, 17 March 1959 by Markl; wings 145-153.5 mm. Two other specimens in MAKB and eight in the Peruvian collections of Maria Koepcke and W. Markl have not been examined.

Derivation of name.-
pacificus: from the Pacific side of Peru.
The name *pacificus* was suggested by the late Maria Koepcke (in litt.) who intended to publish several of her West Peruvian findings but put her data at my disposal.

Otus guatemalae rufus new subsp.
(3.19)

Type.-
USNM 88.7.20.64, sex unknown, adult, March 1880, Balzar Mts. western Ecuador; extreme red morph, wing 142.5 mm; collected by Illingworth.

Distribution and habitat.-
Pacific lowland and foothills around the Bay of Guayaquil from Tumbes, Peru to Rio Vinces, western Ecuador.

Diagnosis.-
Resembles *pacificus* but smaller and much more rufous in both morphs; tarsi well feathered.

Additional specimens examined.-
AMNH 181060, W. Ecuador at Cerro Manglar Alto, 17 May 1923; by Tate; brown morph. ChiNHM 222288, NW Peru at Tumbes, 25 June 1954; by Kalinowski; red morph; wings 142.5-146 mm. Another red specimen from Vinces, collected by Salvadori and Festa but not seen is listed here, based on Chapmans description, Am. Mus. Novit. 332, 1928: 5.

Derivation of name.-
rufus: has a rufous appearance.

Otus trichopsis inexpectus new subsp.
(5.1)

Type.-
ChiMNH 15282, adult female, Porto Jimenez, Costa Rica, 30 May 1892, collected by Verrill; red morph, primaries clipped, but estimated length of wing 142 mm.

Distribution and habitat.-
Upper tropical to lower temperate zone on Pacific side of Costa Rica, and Western Panama; precise elevations not known.

Diagnosis.-
This form is the approximate ideal in appearance between *O. guatemalae pacificus* and *O. trichopsis pumilus*, and could be recognised under either species. The almost complete lack of feathers or bristles on the toes would support inclusion under *O. guatemalae* (*pacificus* group), but the short tail makes it more closely resemble *O. tr. mesamericanus*.

Additional specimens examined.-
In addition to the type I only know of two other specimens: BMNH 88.7.20.52, adult, sex unknown, Panama, without locality, Whiley collection, brown morph, wing 147 mm. BMNH 50.-1.31.123, adult, sex unknown, Central America, without locality, collected by Kellett & Wood before 1875, as the specimen was described by Sharpe (1875, Cat.B.B.M: 114); wing 150.5 mm, brown morph.
There have been no recent discoveries to indicate the present existence of this race. The habitat may have been completely destroyed.

Derivation of name.-
inexpectus: unexpected distribution (Costa Rica/Panama).

Otus choliba caatingensis new subsp.

(11.1)

Type.-
ChiMNH 191645, male adult, July 1949, Janaúba, northern Minas Gerais, grey morph, wing 159 mm, collected by Ricardo Medeiros Berla.

Distribution and habitat.-
Deciduous dry tropical forest and scrub ("caatingas") of north-eastern Brazil from Maranhao and central Pernambuco through the interior of Bahia to northern Minas Gerais.

Diagnosis.-

Differs from the coastal *decussatus* by markedly blacker shaft-streaks and cross bars on whiter under parts; legs almost without ochre pigments. In its dark appearance resembles *wetmorei*, which inhabits similar deciduous forests, but *caatingensis* has more reduced vermiculations.

Additional specimens examined.-
Northern Maranhao: 5 Miritiba and 1 Primeira Cruz; wings 152.5-158 mm; Bahia: 2 Itha, and 2 Mun. da Barra; Minas Gerais: 1 Janaúba; wings 156-161.5 mm. Specimens in BMNH, ZSBSM, SMNStut, NHMWien, LACM and MCZ.

Derivation of name.-
caatingensis: from the caatingas, NE Brazil.

Otus choliba chapadensis new subsp.

(11.3)

Type.-
AMNH 34595, female adult, 9 Feb. 1883, Serra de Chapada, Mato Grosso collected by H.H. Smith.

Distribution and habitat.-
Savannahs ("campos") of western Minas Gerais, Goiás and Mato Grosso, possibly also in Guaporé.

Diagnosis.-

Intermediate in appearance between *decussatus* and *wetmorei* but paler than both (less buff-white underground and with generally more fulvous ochre on upper parts).

Additional specimens examined.-
Mato Grosso: 6 Sierra da Chapada, 1 Engenho do Cap. Gama, 1 Caicara and 2 without locality; wings 160-166 mm; Goias: 1 Araguantins, 1 Cana Brava, 1 Goiania and 1 without locality; Minas Gerais: 1 Cascata and 1 near Bagagem; wings 158-172 mm. Specimens in BMNH, AMNH, USNM, LSUMZ, MCZ, UWiscZM, ZSBSM, NHMWien.

Derivation of name.-
chapadensis: from Chapada, Mato Grosso, Brazil.

Otus choliba urugaii new subsp.

(11.7)

Type.-
AMNH 76736, female adult, 29 May 1958, Argentina, Misiones, Arroyo, River Uruguai, km 10; inter-morph, wing 180 mm; collected by W.H. Partridge, as one of a series of 14 containing 8 grey, 3 inter, and 3 red morphs (one very red).

Distribution and habitat.-
Subtropical conifer forests of the Upper Uruguai and Pelotas valley and adjacent parts of Misiones, Rio Grande do Sul, Santa Catarina and Paraná, and extending through the Serra Paranapiacaba into southern Sâo Paulo.

Diagnosis.-

Resembling *choliba*, but with much more ochreous wash all over the plumage and with much denser vermiculations and irregular bars, particularly on the under parts.

Additional specimens examined.-
Brazil, Sâo Paulo: 1 San Jeronymo, Tieté (very dense vermiculations), wing 170.5 mm; Santa Catarina: 1 without locality, juvenile, wing 173 mm; Argentina: 23 Misiones; wings 165-180 mm; 1 Entre Rios, Concepcion del Uruguay; Uruguay: 1 Ayo Negro and 1 without locality; wings 173-174 mm; those from the lower Urugai valley (Entre Rios; Uruguay) are intermediate with *wetmorei*. Specimens in AMNH, BMNH, MCZ, YalePM, LACM, LSUMZ, NHRMSt, MHNPar and ZSBSM.

Derivation of name.-
uruguaii: from the Rio Uruguai, Misiones, Argentina.

Otus choliba alilicuco new subsp.

(11.8)

Type.-
BMNH 99.1.27.236, male adult, 15 Sept. 1895, Argentina, Prov. Salta, Rosario, black morph, wing 172 mm, collection of Dr. F.P. Moreno, by Gesling. (Vulgar name "alilicuco" in Tucuman; (see Menegaux, Rev. fr. Orn., 17: 290, 1925).

Distribution and habitat.-
Subtropical sclerophyls and xerophytic shrub in the southern Andes foot-hills ("monte") south of the Cordilleras Central, from southern Bolivia (upper Pilcomayo valley) to central Argentina (prov. Cordoba); breeding above 500 m and descending out of breeding season to the plains in the area of *wetmorei*.

Diagnosis.-

Average size larger than *wetmorei* and generally darker, less rufous, with dark patterns on rather white under-ground.

Additional specimens examined.-
Argentina Salta: 1 Oran (Oct.), 1 Rosario (type), 1 Anta, 500 m (Sept.); 1 Tucuman 260 m (Sept.), 1 Tucuman 390 m (pullus, Dec.); Jujuy, 1 Juto 400 m (May); Santiago del Estero: 1 Suncho Corral 800 ft. (Apr.), 1 Lavalle 1800 ft. (June); wings 170-182 mm. For the occurrence in Cordoba see Lee, Ibis 1873: 137, White, B. of Arg. Rep. 1883: 40 and Frenzel, J.F. Orn. 1891: 115. Specimens in AMNH, BMNH, MCZ, NHRSt, MAKB, ChiMNH, ZSBSM and ZMKb.

Derivation of name.-
alilicuco: derived from the vulgar name at Tucuman, Argentina.

Otus choliba koepckei new subsp.
(11.9)

Type.-
Koepcke collection 1699 a.u. on loan in AMNH, female adult, 3 Aug. 1960, Peru, Dep. Ancash, Quebrada Yanganuco, near Yungai, Cordillera Blanca, in Polylepis wood, 4000 m, grey morph, wing about 180 mm, collected by Maria Koepcke.

Distribution an habitat.-
Peruvian and Bolivian Andes between 1500-4500 m (5000-15000 ft), in Bolivia eventually lower; subtropical and lower temperate dry woodland and cloud forest, up to the tree limit.

Diagnosis.-

Resembling *duidae* but upper parts darker on average, less rufous, and under parts more white with heavy, black shaft streaks and cross bars; bars irregular and averaging 4 on each feather; tarsi yellowish. On average the Bolivian specimens are smaller and more rufous, intermediate with *alilicuco*.

Additional specimens examined.-
Peru, Ancash: 1 Yanac 13-15000 ft and 2 Quebrada (type locality); 6 Chachapoyas 8600-9400 ft; 1 Ayacucho Ninabamba 7500 ft; wings 173-187.5 mm; Bolivia, Dep. La Paz: 7 Chuluman and 5 Irupana, 1 Cochabamba, Tin Tin, above Mizque; wings 169.5-179 mm. Specimens in BMNH, AMNH, ANSPh, MAKB, ChiMNH, NHRMSt and Koepcke collection.

Derivation of name.-
koepckei: after Maria Koepcke, Peru.

Otus choliba caucae new subsp.
(11.11)

Type.-
RMNHL 8091, male adult, 25 June 1938, Colombia, Rio Cauca, El Tambo, 5100 ft; dark morph, wing 177 mm; collected by Kjell von Schneidern.

Distribution and habitat.-
Upper Cauca and Upper Patia valley, Colombia, and possibly also in adjacent Ecuador; savannah and cultivation at elevations between 5000-6500 ft.

Diagnosis.-

Closely resembling very rufous red *portoricensis* but with strongly reduced cross-bars on the under parts, 3-4 on a feather against 5-6 in *portoricensis*; much more rufous than *alticolus* or *luctisonus*.

Additional specimens examined.-
Colombia: 29 El Tambo, 1 Popayan; wings 173.5-182 mm; 3 Cali, 2 Pavos La Cumbre, 8 near Medellin, 2 Santa Rosa Bolivar; wings 172-190 mm. Specimens in AMNH, BMNH, USNM, ANSPh, CMP, ZSBSM, MNHGen and NHRMSt.

Derivation of name.-
caucae: after the Rio Cauca, Colombia.

Otus choliba guyanensis new subsp.
(11.15)

Type.-
BMNH 88.7.20.63, male adult, 9 Jan. 1884, Mt. Roraima, 3500 ft, Guyana, grey morph, wing 171.5 mm; collected by H. Whitely Jr.

Distribution and habitat.-
Higher parts of Venezuela (Bolivar) and the Guyanas above 350 ft.

Diagnosis.-

Darker, with heavier shaft streaks and denser vermiculations than coastal and Amazonian *crucigerus*, less blackish than *duidae*.

Additional specimens examined.-
Venezuela. Bolivar: 2 at base of Mt. Duida, 1 at Maripa, 1 Agua Salada, 1 Perico, 1 Cocallar and 1 Auyantepui; Guyana: 3 Roraima, 4 Rupununi River, 1 Quonga, 1 Abary River, 1 Supenam River and 1 Demarara; wings 162-181 mm; no specimens seen from the interior of Surinam and French Guyana; specimens in AMNH, BMNH and MHNPar.

Derivation of name.-
guyanensis: from (British) Guyana.

Otus choliba montanus new subsp.

(11.16)

Type.-
BMNH 1914.11.22.219, male adult, 15 Apr. 1909, Mérida. Montana Sierra, Valle, 2000 m, Venezuela: dark morph, wing 173.5 mm; one out of a series of many specimens collected by S. Briceno Gabaldon.

Distribution and habitat.-
Northeastern Andes from Cucuta (Colombia) throughout Venezuela, above 1000 ft.

Diagnosis.-

Closely resembling *guyanensis* but generally darker, less rufous, except in red morph specimens; under parts distinctly darker, but not as black as in *duidae*; much larger and darker than *margaritae*.

Additional specimens examined.-
Colombia, Andes of Cucuta: 1 Cucuta, 2 Soata and 1 Villa Felisa; Andes of Mérida, 2 Valencia, 2 Caracas, 1 San Julien and 1 Rio Caicara (northern Venezuela); 60 specimens; wings 168-179 mm; some specimens from northern Venezuela are paler, and intermediate in coloration, but not in measurements, with *margaritae*; specimens in BMNH, AMNH, USNM, SMNStut, MAKB, Senck-MF, ZSBSM and RMNHL.

Derivation of name.-
montanus: from Montana Sierra, Valle, Venezuela.

Otus choliba kelsoi new subsp.

(11.18)

Type.-
AMNH 59483, male adult, 10 March 1893, Princetown, Trinidad, grey morph, wing 168 mm; collected by F.M. Chapman. Replaces *Otus choliba portoricensis* Kelso, 1942, Biological Leaflet, 14: 2 (Trinidad), preoccupied.

Distribution and habitat.-
Tobago (?), Trinidad and delta of the Orinoco, Venezuela.

Diagnosis.-

On average larger and darker than *margaritae*, *guyanensis* and *montanus*; particularly under parts with more grey vermiculations and brown pigments on white underground.

Additional specimens examined.-
20 Trinidad; wings 164-173 mm; no specimens examined from the Orinoco delta. Occurrence on Tobago doubtful.

Derivation of name.-
kelsoi: after Leon Kelso.

Otus seductus colimensis new subsp.

(13.2)

Type.-
LSUMZ 39853, male adult, 7 miles south of Colima, Colima, 24 Dec. 1958, wing 175.5 mm, collected by W.J. Schaldach, Jr., as one of a series of 21 specimens taken in Dec. 1958 and Jan. 1959.

Distribution and habitat.-
Basin of Colima river in the state of Colima, Mexico, and also likely in adjacent Jalisco; not in the coastal plains.

Diagnosis.-

Averages larger and more uniformly buff (less vinous) than *seductus*; toes more feathered.

Additional specimens examined.-
21 Colima, in a radius of 18 km around Colima: wings 173.5-190.5 mm. All specimens seen in LSUMZ.

Derivation of name.-
colimensis: from Colima, Mexico.

Otus atricapillus ater new subsp.

(14.1)

Type.-
USNM field nr. 196899, male adult, 22 July 1964, Belem, Para; wing 180 mm; collected by P.S. Humphrey.

Distribution and habitat.-
Forests of Para to Rio Tocantins.

Diagnosis.-

Differs from *ustus* and *lophotes* by being strongly blackish; almost purely black back and completely black cap separated by two dirty white collars; belly dirty ochre brown with heavy herring bone-like vermiculations; breast almost blackish.

Additional specimen examined.-
Para: Rio Tocantins: 1 at Baiao (AMNH 430282) slightly more intermediate with *ustus*; wing 184 mm.

Derivation of name.-
ater: has a black appearance.

Otus atricapillus morelius new subsp.
(14.3)

Type.-
AMNH 115738, male, 22 July 1912, La Morelia, Rio Caqueta, 600 ft Colombia; wing 173.5 mm; collected together with a female by L.E. Miller.

Distribution and habitat.-
Eastern slopes of the Andes in Colombia and Ecuador from the foot-hills (Morelia) up to 3000 ft (Rio Napo), including the rivers Guapaya, Pisqui, Curaray, Copataze, Punino and Capaguari.

Diagnosis.-
Closely resembling *ustus* but in both morphs more uniformly coloured, lacking the white spots on the under parts; generally darker brown. Much more rufous below and black brown on back than *inambarii*.
Based upon 7 specimens examined, *morelius* integrades with *ustus* at Sarayacu. There is an old undated specimen (SenckMF 25.403) collected by Nehr Korn at Bogota, Colombia, which is very rufescent but pale.

Additional specimens examined.-
1 Peru Rio Cenepa, Tutinucu (LSUMZ); 34 eastern Ecuador (BMNH, AMNH, ChiMNH, MCZ, NHMBas, SenckMF, ZMHamb, NHRMSt and LSUMZ); 6 Colombia at Morelia, Meta and Bogota (AMNH, ChiMNH); wings 164-187 mm.

Derivation of name.-
morelius: from La Morelia, Colombia.

Otus atricapillus inambarii new subsp.
(14.4)

Type.-
ChiMNH 222284, female, 28 June 1953, Quince Mil. Huajyumba, at side river of the Inambari, Cuzco, 630 m, Peru; wing 179.5 mm; collected by C. Kalinowski.

Distribution and habitat.-
Eastern slope of the Andes in Peru and Bolivia from the Upper Apurimac River to Cochabamba; elevations between 1000-3000 ft.

Diagnosis.-
Generally like *ustus* but breast and abdomen much more heavily vermiculated on a more purely white underground, superficially resembling *O. guatemalae napensis*. Scapular streak more white (less ochre) than in *ustus*. Differs from *morelius* in being less dark rufous brown and in having much more white on abdomen.

Additional specimens examined.-
Peru: 1 Macarpata at Rio Musiniscato, 2 Huajyumbe (ChiMNH), 1 Luisiana at Upper Apurimac (AMNH) and 7 Balta at Rio Curanja (LSUMZ); Bolivia: 1 Cochabamba at Chipiriri (LSUMZ); wings 170-180 mm.

Derivation of name.-
inambarii: from the Rio Inambari, Cuzco, Peru.

Otus atricapillus fulvescens new subsp.
(14.6)

Type.-
AMNH 34597, female adult, 20 July 1883, Chapada, Mato Grosso; rufous morph; collected by H.H. Smith, wing 173 mm. On the label "*Megascops fulvescens* Ridgway", a nomen nudem.

Distribution and habitat.-
Remnant patches of forests spread through the savannahs from northern Bolivia and Mato Grosso to Bahia; now probably extinct.

Diagnosis.-
In both morphs much paler than *lophotes* but otherwise resembling that race rather than *ustus*; upper parts less uniformly dark and more mottled than in *ustus*, scapular streaks almost white rather than ochreous.

Additional specimens examined.-
Bolivia: 1 Victoria at Confluencia Rio Madre de Dios - Rio Beni, 175 m, in swamp forest (NHRMSt); Brazil, Mato Grosso: 1 Chapada, 4 Engenho do Cap Gama (AMNH, BMNH, NHMWien); Bahia: 2 without locality, by Wucherer and Parzudaki (BMNH); Amazonas: Rio Purus, 2 Hyutanakaw (CMP) and 1 Aramuâ (NHRMSt); Para: 2 Rio Tapajoz and Rio Est at Caxiricatuba (NHRMSt) and Trinidad (AMNH); those from Rio Purus and Rio Tapajoz intermediate with *ustus*; wings 164-174 mm.

Derivation of name.-
fulvescens: has a fulvous appearance.

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