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OTUS MARSHALLI, A NEW SPECIES OF SCREECH-OWL FROM PERÚ

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ABSTRACT.—*Otus marshalli*, a new species of screech-owl, is described from the Andes of south-central Perú. Its nearest relatives appear to be the Central American species *O. barbarus* and *O. clarkii*. It is one of four species of screech-owls in an elevationally replacing series distributed along a heavily forested slope rising 3,000 m from valley floor to cordilleran crest: *Otus watsonii* occurs in lowland rain forest, *O. ingens* in lower cloud forest, *O. marshalli* in mid-elevation cloud forest, and *O. albogularis* in upper montane forest. Received 17 September 1979, accepted 13 October 1980.

THE now-routine use of mist-nets in ornithological exploration has increased the frequency of encounters between collectors and small owls. It was by this means that the distinctive new owlet *Xenoglaux loweryi* was found (O'Neill and Graves 1977). To our knowledge, two apparently undescribed species in the genus *Otus* have also been discovered with the aid of nets during recent years. Here we describe the first of them (Frontispiece), a bird that we found to be common in the mid-elevation cloud forest on the eastern Andean slope in south-central Perú.

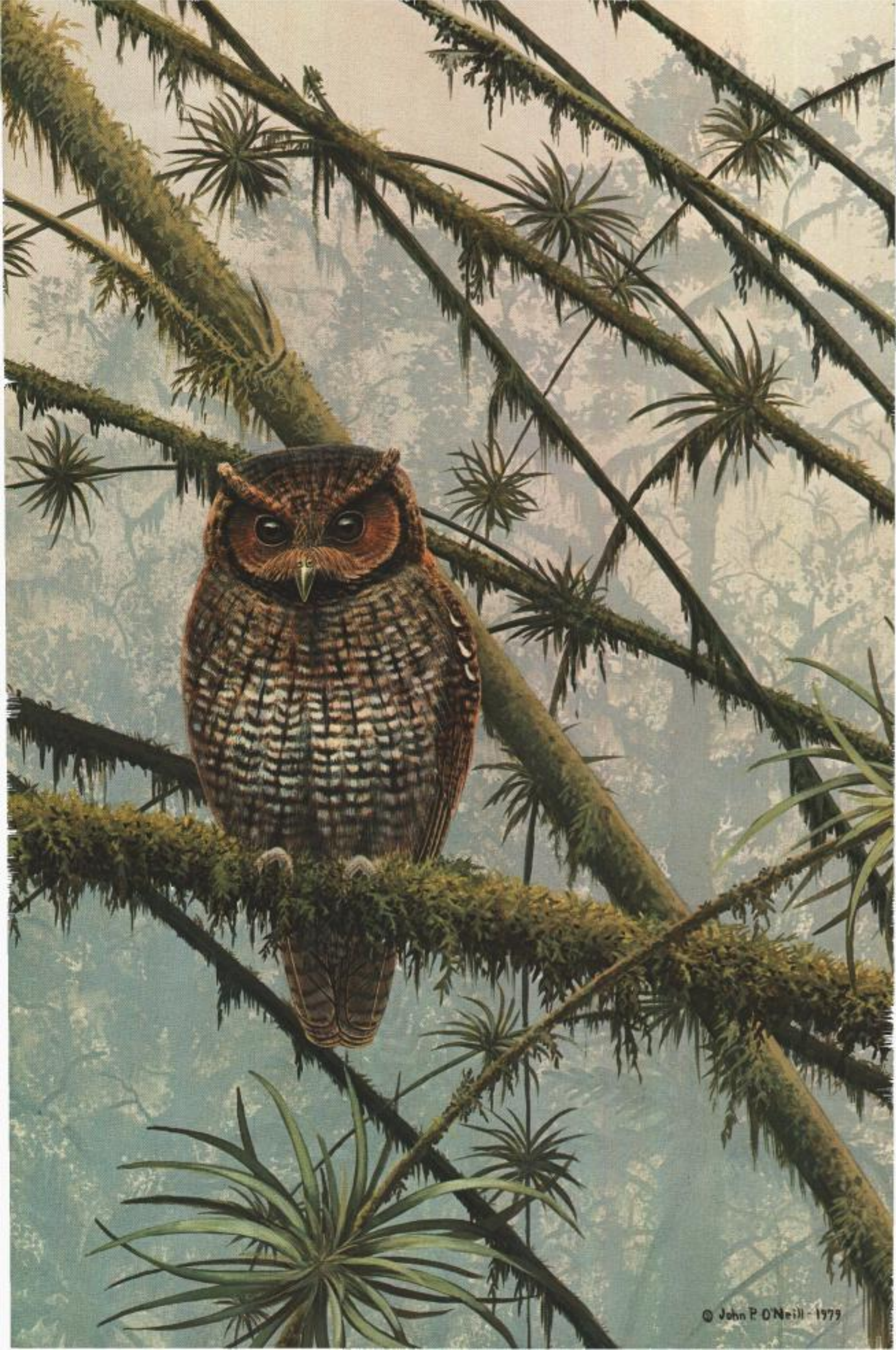
Otus marshalli sp. nov.

Cloud-forest Screech-Owl

HOLOTYPE: American Museum of Natural History No. 824160; adult male from the Cordillera Vilcabamba, 12°38'S, 73°36'W, elevation 2,180 m, Provincia de La Convención, Departamento de Cuzco, Perú, 30 June 1967; collected by John S. Weske and John W. Terborgh; prepared by Weske; original number 1221.

DIAGNOSIS: A medium-sized, rufescent *Otus* with facial discs broadly rimmed with black, a rather prominent whitish coronal band, and short ear tufts. Differs from all other Neotropical *Otus* (except *O. barbarus* Sclater and Salvin and *O. clarkii* Kelso and Kelso) in belly pattern, which is "not of normal *Otus* style" (Marshall 1967: 4) and consists of transverse white spots separated by bold black and rufous bars and streaks. Differs from *O. barbarus* in being much larger, having more extensively feathered tarsi and dark brown (vs. yellow) irides, and having a dorsal pattern of black transverse markings on rich chestnut ground color (not streaked or spotted). Differs from *O. clarkii* by being smaller, by having more extensively feathered (not largely bare) tarsi and dark brown (vs. yellow) irides, and

Frontispiece. The Cloud-forest Screech-Owl, *Otus marshalli*, a new species from the Cordillera Vilcabamba of Perú. From an acrylic-watercolor painting by John P. O'Neill.



by having facial discs solidly rufescent and rimmed with black (vs. vermiculated and without black rims).

DISTRIBUTION: At elevations from about 1,920 to 2,240 m on the slopes of the northern Cordillera Vilcabamba in the Departamento de Cuzco, Perú. The type locality lies on the south side of the watershed of the Río Mapitunari, a tributary of the Río Apurímac.

DESCRIPTION OF THE HOLOTYPE: Dorsal coloration rich chestnut-brown irregularly barred and mottled with blackish; typical feathers of central back have four wavy, blackish cross-bars (each ca. 3 mm wide) on a chestnut background, with the distal bar often scattered and reduced to mottling; feathers of anterior back have broken and mottled black-on-chestnut barring limited to the terminal 6–9 mm and are unmarked buffy rufous basally, forming a concealed buffy nuchal band. Crown like dorsum, but more extensively black, especially anteriorly, where feathers are black centrally with rufescent and black barring (ca. 2 mm wide) laterally. Hind crown with a whitish band, the individual feathers white with narrow rufescent and dusky tipping and one fine cross-bar (dusky with rufescent border). Short ear tufts, the feathers buffy and whitish with rufous and blackish tips. Outer scapulars each with a white or buffy white spot covering much of outer web and with a blackish area (ca. 5 mm wide) at web's tip. Tertiaries and most wing coverts like back, but outermost secondary coverts with buffy whitish spot on outer web. Outer webs of secondaries and primaries banded with dusky and tawny; inner web of primaries dusky for most of its length, but with two rather dimly defined pale bands distally and with tip (ca. 12 mm) dull tawny, mottled with dusky. Tail with rufous and blackish bands (eight of each), the blackish bands less distinct and narrower toward the tip. Facial bristles well-developed. Facial discs richly rufous with a broad blackish border posteriorly; just anterior to the lower end of this border, in the malar area, is a small whitish spot; eye bordered anteriorly by a narrow dusky line that widens to a dusky patch above the eye; superciliary and loreal feathers whitish basally and tipped with rufous. Throat feathers rufous with dusky shaft-streaks (ca. 2 mm wide); sides of neck like the back; anterior breast dull rufous obscurely barred with dusky; posterior breast whitish with a scattering of blotchy black spots, the individual feathers rufescent white with a narrow blackish cross-bar and a narrow blackish shaft-streak that widens distally making the tip (ca. 6 mm) entirely black. Abdomen whitish with a pattern of longitudinal and transverse markings giving the area an irregularly white-spotted appearance; each abdominal feather has a blackish shaft-streak and two blackish cross-bars bordered with rufous, forming three pairs of white spots. Thighs tawny rufous, tarsus nearly completely feathered (all but the distal 2 mm) and tawny, toes unfeathered and slender. Crissum whitish, with several feathers having a narrow brownish tip and a brownish cross-bar. Soft part colors (in life): iris dark brown, toes flesh-colored, bill grayish-yellow.

MEASUREMENTS OF THE HOLOTYPE (mm): Chord of wing 164.0, tail (from insertion of the two central rectrices to the tip of the longest rectrix) 91.0, tarsus 28.9, bill (from anterior edge of nostril to tip of maxilla) 10.7.

ETYMOLOGY: We are pleased to name this species for Joe T. Marshall, Jr., in recognition of his long-standing interest in the genus *Otus* and night birds generally and of his contributions to the knowledge of these elusive and fascinating creatures.

REMARKS

Variation among paratypes.—Although variable in their details, the eight specimens at hand form a fairly uniform series, especially when one considers the great variation found in many other species of *Otus*. All specimens are of the "normal" phase (Marshall 1967); a true red phase, in which upperparts are bright rufous with blackish transverse markings much reduced or lacking, is not known to exist.

Individual variation in color occurs within a rather narrow range. Among the seven males, one is more richly rufescent than the others, both above and below. Another is less rufescent than the rest, especially on the dorsum, which is warm brown in ground color. On this bird the blackish dorsal vermiculations are finer and more regular than the average. The clarity and alignment of the ventral pattern vary within the series, with the transversely elongate white spotting showing more distinctly in some individuals than in others. One has an unmarked whitish area on the central abdomen. The holotype is not one of the birds in which the belly pattern is especially well-defined, but it was judged to be the specimen showing most typically the other color characteristics of the series.

The female specimen agrees well with the series of males in dorsal coloration. Ventrally it is somewhat less richly colored, and, in particular, the abdominal markings are narrower and more brownish (less blackish) than in males. The pattern on the abdomen, however, is essentially the same as in the males, although less boldly defined. Measurements of the female are larger than the male average, falling within the upper part of the male range of variation for wing and tail and slightly exceeding it for tarsus and bill. A small degree of sexual dimorphism in size may exist. (In the related *Otus clarkii*, however, the difference in wing length of males and females is not statistically significant.) For the entire series, including the holotype, the measurements (in mm; $\bar{x} \pm SD$, range) are—7 males: chord of wing 157.6 ± 5.2 (151.5–164.0), tail 87.7 ± 3.0 (84.6–91.5), tarsus 27.5 ± 1.0 (26.0–28.9), bill 10.3 ± 0.3 (9.9–10.7); 1 female: wing 162.0, tail 91.2, tarsus 29.9, bill 11.2.

Two of the male owls are immature and retain their juvenal flight feathers. The dark barring of their rectrices is narrower than in the adult, with 10 bars present instead of eight. The markings on the tips of the primaries are reduced, and the ground color of the remiges is paler than that of the dorsum, which is in basic plumage. The contrast between rich dorsal coloration and pale remiges is particularly strong in the bird mentioned above as more rufescent than others in the series. This individual seems to have ended its first prebasic molt, but the other immature still has among its mainly basic body plumage a few retained juvenal feathers of lax, "decomposed" texture in the scapulars and elsewhere. This bird shows more wear than others in the series and is paler and less boldly marked about the face. The juvenal scapulars have buffy ground color (nearly whitish on one feather) with four brownish cross-bars (ca. 2 mm wide). Thus, they have the pattern of the adjacent dorsal feathers but not the chestnut and black color of those. Two Costa Rican juveniles of *Otus clarkii* were available for comparison, one in first prebasic molt and the other in complete juvenal plumage. The juvenal scapulars in *O. clarkii* are similar to those in the *O. marshalli* specimen, but the cross-bars are wider (ca. 4.5 mm), and coloration is less contrasting (i.e. ground color darker buff and bars a less dark brown).

Habitat.—*Otus marshalli* occurs in cloud forest, a vegetational formation that is richly developed in the Cordillera Vilcabamba. The tallest trees reach 40 m in height, forming an irregular and broken canopy. Wide spaces between the crowns admit a great deal of light into the understory, which consequently assumes an almost impenetrable luxuriance. Climbing bamboo (*Chusquea* sp.) grows in profusion, forming scattered "breaks" in more open spots. Shrubby Rubiaceae, Ericaceae, and Melastomaceae are abundant, as are several species of tree ferns. Emergent trees are massively festooned with mosses, ferns, orchids, and other epiphytes, their trunks garbed in thick, soggy cloaks of mosses and bryophytes. Our expeditions were all made in the dry-season months, but rain occurred frequently even then, and the slopes were shrouded much of the time in mists so heavy that they often obscured the taller crowns. Downslope currents, beginning in late afternoon or early evening, reversed the upward convective flow of midday, resulting in clear skies until the cycle was reinitiated the next morning by the rising sun.

Habits and ecological relationships.—All of our encounters with the new screech-owl were by means of mist-nets left open overnight. On occasion we did hear vocalizations in the night that probably were given by these birds—a monotone series of notes similar to that given by other species of *Otus*. Unfortunately, we never were able to link the call to the owl, nor do we have a tape-recording of it. Within its range, the new owl seems to be common. It was more frequently captured than any other species of *Otus* at any locality we have visited in Perú. Usually one is fortunate to catch even a single individual of this genus. The owl reached peak abundance at 2,130–2,190 m in elevation, where it was the 29th most commonly netted bird species among a total of 53. Species most frequent in this sample were the hummingbirds *Coeligena coeligena* and *C. torquata*, the antbird *Drymophila caudata*, the tyrant-flycatchers *Ochthoeca pulchella* and *Mionectes striaticollis*, and the wood-warbler *Basileuterus coronatus*. The only other owl that we found sympatric in elevation and habitat with *Otus marshalli* was the pygmy-owl *Glaucidium jardinii*.

We made a visit of 1–3 weeks' duration to the habitat of *Otus marshalli* in 3 different years, netting a total of 12 individuals. Four of these were released, including three that we banded. None of the three was recaptured. All 12 were obtained within 3 km of one another along a transect that extended about 25 km from the Río Apurímac to the crest of the Cordillera Vilcabamba. Ten were netted in a 500-m-long net-line from 2,070 to 2,260 m in elevation, and the other two at the upper end of a 400-m-long net-line transecting 1,700–1,930 m. The trail connecting the two net-lines passed through appropriate habitat for the owl, and similar undisturbed cloud forest appeared to cover the slopes of the cordillera at this elevation for many kilometers in both directions. Availability of habitat and frequency of capture suggest that a substantial population of the new owl exists.

On the heavily forested eastern Andean slope of Perú, congeneric species are often distributed in elevationally replacing series (Terborgh 1971, Weske 1972, Terborgh and Weske 1975). The genus *Otus* provides a good example of such a distribution pattern, because the elevational series comprises at least four species. In the lowlands of the Apurímac/Ene Valley, *Otus watsonii* inhabits primary rain forest between 340 and 600 m. No screech-owl was encountered in the humid lower montane forest along our Cordillera Vilcabamba transect. *Otus ingens* occurs in cloud forest from 1,370 to 1,790 m, its range approaching but apparently not overlapping that of *Otus marshalli*, which covers the cloud forest belt from 1,920 to 2,240 m. Humid upper

montane vegetation, including elfin forest, is inhabited by *Otus albugularis*, which we recorded from 2,650 m to the crest of the Cordillera Vilcabamba at 3,520 m.

It is likely that two other *Otus* are present in the area at lower elevations but were overlooked by us. *Otus guatemalae* is to be expected in humid lower montane forest. Chapman (1921) reported as *Otus choliba* a screech-owl from 4,000 ft (1,220 m) on the Río Comerciato, a river in the Río Urubamba drainage that flows out of the Cordillera Vilcabamba only about 60 km east-northeast of our transect. Kelso (1940) correctly reidentified the specimen (USNM 273069) as *O. vermiculatus*, which is now treated as conspecific with *O. guatemalae*. Furthermore, we netted *O. guatemalae* in appropriate habitat at similar elevations (860–1,300 m) in the Cerros del Sira in the Departamento de Huánuco in central Perú. On the Vilcabamba transect, we kept our mist-nets furled overnight at our 930-m study site because of an abundance of bats, thus greatly reducing the chance of capturing an *Otus* there.

If *Otus guatemalae* is indeed present, the elevational series of screech-owls comprises five species, all with non-overlapping ranges. The sixth species to be expected in the region is *Otus choliba*, a lowland form that occurs widely in western Amazonia at the same elevations as the forest-dwelling *Otus watsonii* but in different habitat. *Otus choliba* inhabits *matorral*, the distinctive successional vegetation that is characteristic of riparian flood plains (Terborgh and Weske 1969). Chapman (1921) correctly reported *O. choliba* from the valley of the Río Urubamba, the next major river east of the Apurímac (AMNH specimens examined by JSW).

Breeding information.—The gonadal condition of *Otus marshalli* specimens indicates that breeding was in progress during the period from late June to mid-August. The female on 4 July 1967 had the ovary and oviduct much enlarged, with the largest ovum 4 mm in diameter. The testes of 5 males in fully adult plumage measured as follows: 7 mm on 27 June 1967, 7 mm (left) and 6 mm (right) on 7 July 1967, 8 mm on 14 July 1967, 8 mm on 16 August 1966, and 5 mm on 18 August 1967. The preponderance of males in our collected sample suggests that females were incubating. On the other hand, evidence from the two immature specimens indicates that breeding may also occur well before June. The owl that was still young enough to retain some juvenal body feathers must nevertheless have been several months old, because its plumage already had become rather worn. This bird was not in breeding condition (testes 2.5 mm on 2 July 1967). The other immature, whose partial prebasic molt had finished, could have been anywhere from several months to about 1 yr old. It was in breeding condition (testes 6 × 3 mm on 2 August 1968). In this species, apparently, the young attain sexual maturity at least by the end of their first year, and the breeding season may be quite extended.

Systematic relationships.—The closest relatives of *Otus marshalli* appear to be *Otus barbarus*, of southern México (Chiapas) and Guatemala, and *Otus clarkii*, of Costa Rica and Panamá (barely extending over the border into adjacent Colombia). These three species comprise a group within *Otus*, as suggested by Marshall (1978 and in litt.). Besides having a distinctive white-spotted pattern on the abdomen, they are alike in possessing unusually long, profuse facial bristles and in inhabiting cool, moist, montane forests. We have considered whether the new form might be a well-differentiated geographic representative of *O. barbarus* or *O. clarkii*, but we conclude that it is specifically distinct. In appearance it most resembles *O. barbarus*, which in our opinion is its nearest ally. Both have a white coronal band and the same bold belly pattern. But besides the differences in plumage and iris color already mentioned in the diagnosis, the two species are dissimilar in a number of other

respects. *Otus barbarus* has two conspicuously different color phases, one dark brown with buff, black, and white markings, and the other rich rufous marked with blackish and white. Polymorphism is not known to exist in *O. marshalli*, whose rich chestnut dorsal ground coloration matches neither phase of *O. barbarus*. The dorsal pattern in *O. barbarus* consists, in the brown phase, of many sharply defined whitish and tan spots and, in the red phase, of broad blackish shaft-streaks with a suggestion of blurry, pale spotting. The back of *O. marshalli* is entirely different—never streaked or spotted and with a much more uniform appearance overall because of the blackish vermiculations. The facial disks of *O. marshalli* are solidly rufous and broadly outlined in black; those of brown-phase *O. barbarus* are spotted, and in both phases the black border is narrow or lacking. The outer webs of the primaries are banded with tawny and dusky in *O. marshalli* and with whitish and dusky in *O. barbarus*. These markings in *O. barbarus* (and also in most *O. clarkii*) form a conspicuous pattern on the closed wing of white and dark bars. In *O. marshalli* the similar pattern is much less contrasting, partly because tawny replaces white and partly because the dusky bars become paler as they reach the edge of the vane. But perhaps the most significant difference between *O. marshalli* and *O. barbarus* is in size. We have no weight data for *O. marshalli*, but the bird is very close in measurements to *O. guatemalae* and *O. watsonii*. Our field data for these two species, sexes combined and mostly unknown, yield these averages and ranges: wing chord—9 *guatemalae* 158 mm (153–168), 5 *watsonii* 163 (158–166); weight—9 *guatemalae* 107 g (91–123), 5 *watsonii* 121 (114–130). Because the average wing chord (157.6) of our seven *O. marshalli* male specimens virtually matches that of the *O. guatemalae* sample, the average weight of *O. marshalli* males is probably about 107 g. Allowing for possibly larger size in females, we estimate an average weight of 115 g for *O. marshalli*, sexes combined. By comparison, a specimen of *O. barbarus* from Chiapas weighed 69 g (♀, AMNH 808831), and wing chords of the four *O. barbarus* examined by us averaged 134.7 mm (range 126.6–140.0).

We believe *O. marshalli* is more distantly related to *O. clarkii* than to *O. barbarus*. Several characters in which *O. marshalli* and *O. clarkii* differ conspicuously were mentioned earlier, including iris color, tarsal feathering, and markings about the head. In addition, the abdominal pattern of *O. clarkii* is less boldly spotted than in *O. marshalli* and *O. barbarus*, because the cross-bars on the feathers are broader and less contrastingly outlined (see Marshall 1967: 43). The dorsal pattern in *O. clarkii* includes buffy spotting and is coarser than in *O. marshalli*, and *O. clarkii* is no darker on the crown than on the back. The size difference between the two, while less great than for *O. marshalli* vs. *O. barbarus*, is considerable. Wetmore (1968) provided data on wing chord average and range in *O. clarkii*: 9 males, 179.8 mm (177–182); 10 females, 182.8 (176–184). For males, therefore, *O. clarkii* averages 14% longer-winged than *O. marshalli*. The former's larger size is likewise reflected in weight: two Costa Rican males weighed 149.7 g and 132.7 g (MVZ 161921, –22) and a female from Costa Rica weighed 186 g (specimen, Western Found. Vert. Zool., *vide* Marshall). In the extent of individual color variation, *O. clarkii* and *O. marshalli* are fairly similar. Despite the recognition of two phases by Wetmore (1968), we do not find *O. clarkii* to be polymorphic, judging from the ample series of specimens at hand. Ground coloration is more rufescent in some individuals, more brownish in others, and intermediate in yet others, but the overlying pattern of black and buff is consistent. Such a situation is not true of strongly polymorphic

species like *O. barbarus* and *O. watsonii*, in which the blackish markings are simplified, reduced, or obsolete in the red phase.

The distributional pattern of *O. marshalli*, *O. clarkii*, and *O. barbarus* lends additional support to recognition of *O. marshalli* as a distinct species. The range of *O. marshalli* is 2,500 km distant from that of *O. clarkii*, and more from *O. barbarus*. No screech-owl of this group is known from the northern Andes, a region that has been much more thoroughly investigated than Perú.

SPECIMENS EXAMINED

Otus marshalli. The type series: 7 ♂♂, 1 ♀ (AMNH).

Otus barbarus. Guatemala—Baja Verapas [*sic* = Verapaz]: 1 unsexed (AMNH); Uspantán, Quiche: 1 ♀ (USNM); between Cobán and Chisec: 1 unsexed (USNM). México—San José, above San Cristobal de las Casas, Chiapas: 1 ♀ (AMNH).

Otus clarkii. Series of 37 from Costa Rica and Panamá (AMNH and USNM).

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