Short Articles

A Report on a New Geographic Location of Red Uakaris (*Cacajao calvus ucayalii*) on the Quebrada Tahuaillo in Northeastern Peru

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The distribution of the red uakari (*Cacajao calvus ucayalii*) lies entirely in Peru, delimited by the Río Amazonas to the north, the Río Ucayali to the west, and the Río Yavari to the east (Hershkovitz, 1987; Heymann, 1992). Although the southern limit of the subspecies' range is believed to have once extended to the Río Urubamba (Hershkovitz, 1987), the evidence indicates that it is now limited to the Río Sheshea due to overhunting (Aquino, 1988). The red uakari's survival is seriously threatened throughout its range primarily due to hunting and loss of habitat (Aquino, 1988; Bartecki and Heymann, 1987), and *C. c. ucayalii* is listed as vulnerable on the *2002 IUCN Red List of Threatened Species* (Hilton-Taylor, 2002; Rylands *et al*., 1997).

Although the red uakari's distribution has been tentatively established, its current status remains undetermined. In recent years, several published sightings have begun to provide better information about local population numbers. The majority were along the Quebrada Blanco and the Río Yavari corridor, within and to the east of the Reserva Comunal Tamshiyacu-Tahuayo (RCTT) in northeastern Peru (Aquino, 1998; Bartecki and Heymann, 1987; Heymann, 1990; Leonard and Bennett, 1995, 1996; Puertas and Bodmer, 1993). Others are from the Río Tapiche and its tributaries, approximately 300 km south of the RCTT (Aquino, 1988; Bennett *et al*., 2001; Fontaine, 1979). Aquino (1988) reported an additional two troops in the area between the reserve and Río Tapiche (Fig. 1). Because most sightings are confined to these two main areas, documented encounters with wild troops of *C. c. ucayalii* elsewhere are important for a better indication of the actual numbers of wild *C. c. ucayalii*. With human intrusion slowly eradicating local populations of *C. c. ucayalii* (Aquino, 1988; Soini, 1982), it is imperative to assess existing populations before they decline further.

We conducted a preliminary survey of wild troops of *C. c. ucayalii* in and around the Reserva Comunal Tamshiyacu-Tahuayo over 13 days between 30 May and 23 June, 2001.

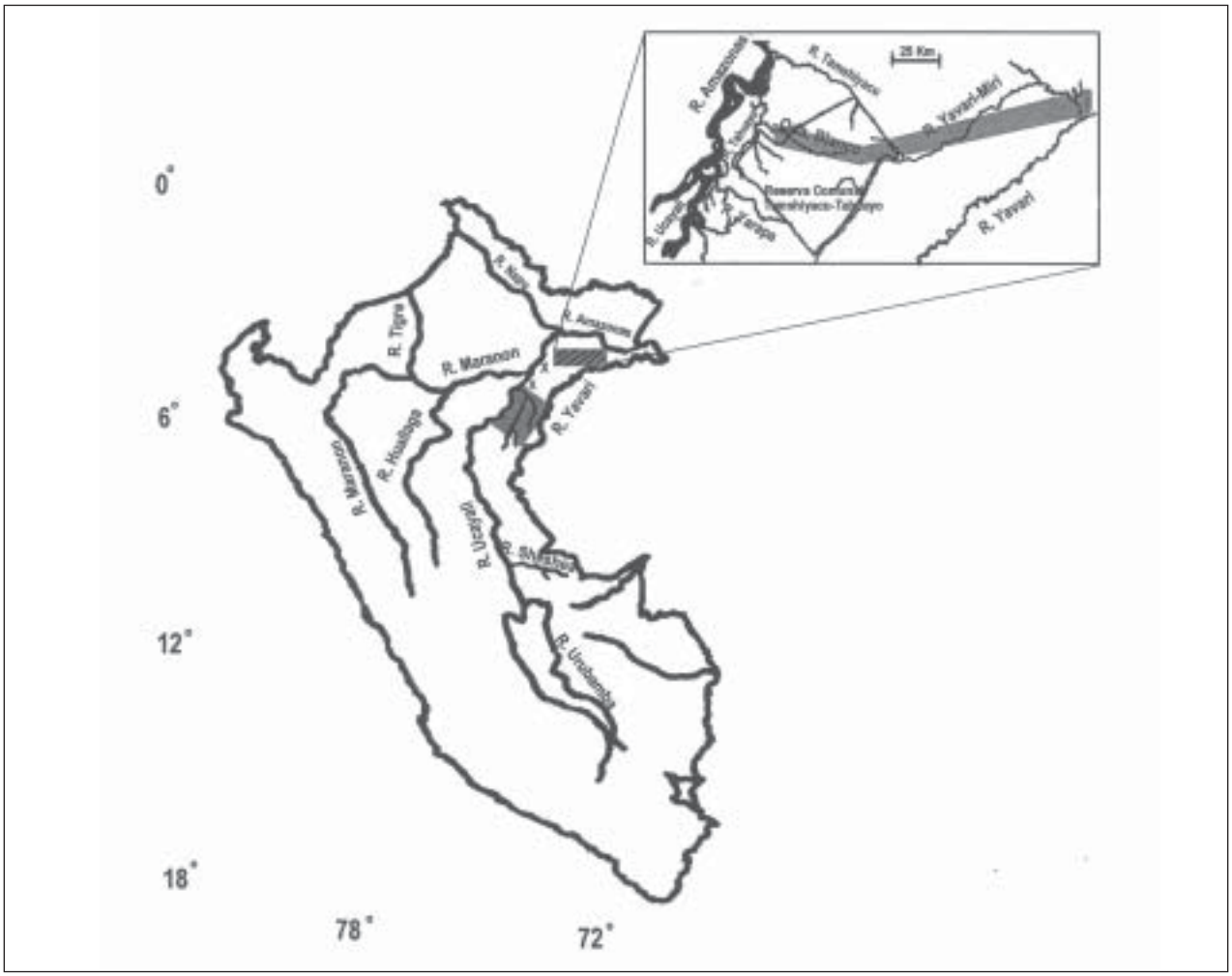

Figure 1. Location of documented sightings of *C. c. ucayalii* – Quebrada Blanco/Río Yavari corridor, and the Río Tapiche area. Two additional sightings between the two main locales are indicated by an "x". (Inset map modified from Bodmer *et al*., 1997.)

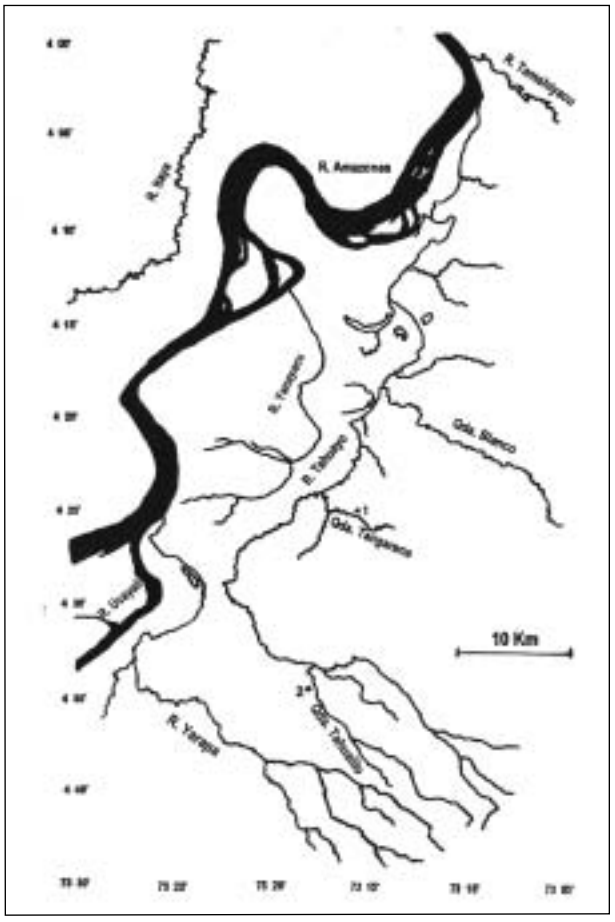

Figure 2. Area of our sightings of *C. c. ucayalii* during our survey. 1. Quebrada Tangarana, 2. Quebrada Tahuaillo.

The primary aim was to identify an area for a long-term study. We searched for *C. c. ucayalii* at various sites along the Quebrada Tangarana, Quebrada Blanco and Quebrada Tahuaillo, tributaries of the Río Tahuayo. Quebrada Tangarana and Quebrada Tahuaillo are black-water streams, while Quebrada Blanco is classified as a white-water stream. We traveled by motorboat and canoe 1-2 days up these tributaries to each destination, and hiked 6-10 hours per day into the forest with two experienced guides. Only the Quebrada Blanco site had trails. Once we encountered a uakari troop, we followed it and recorded *ad libitum* (Altmann, 1974) information on group size, group composition, location, time of day, vocalizations, and as much behavioral data as possible. Geographical coordinates were obtained using a Garmin GPS 12 global positioning system. Terms used for vocalizations are based on Fontaine's terminology (1981).

We located two troops in the course of the survey. We encountered a troop of *C. c. ucayalii* on 3 June 2001 at 04° 24'S, 73° 17'W on the Quebrada Tangarana (Fig. 2). The terrain there consists of undulating hills with primary terra firme forests. At 0957 h, our tracker heard distant contact calls of the uakaris, and we located the troop by following their vocalizations. These were mostly 'hic', with intermittent 'chick' contact calls. We observed the monkeys traveling rapidly in the mid- to upper-level of the canopy. Troop size was estimated at 70 individuals of mixed age/sex classes including both adults and immatures. Three different bouts of screeching 'wa' vocalizations were heard. This call, emitted by the recipient of aggression (Fontaine, 1981), is usually associated with fights. Immediately after hearing one set of these calls, we saw an adult male displaying aggressively by jumping back and forth at the top of a tree and branch-shaking. After three seconds he stopped and looked in our direction.

At 1044 h, while we watched from 50-75 m away, the troop stopped to rest. Most individuals were hidden among the leaves so we could not accurately estimate group spread. All vocalizations ceased except for an occasional contact call. At 1112 h, we tried to move closer, but the troop dispersed. As the monkeys were moving away, they resumed contact calling, but in a more urgent manner (rapid, staccato 'hic' calls, interspersed with an increased frequency of 'chick' and loud 'chyook' calls). At one point, the troop briefly split into two contingents. As the front subgroup moved away, individuals in the rear subgroup stopped and vocalized. Loud and urgent 'chyook' calls were given by individuals which hesitated before jumping across to the next tree, while individuals behind them emitted 'hic' and 'chick' calls. Eventually, some individuals jumped into adjacent trees and the rest followed. We heard three more bouts of the screaming 'wa' vocalizations but again did not see any altercations. At 1400 h, we saw 10 woolly monkeys (*Lagothrix lagothricha*) traveling in the same direction as the uakaris. Previous field researchers have reported *C. c. ucayalii* in frequent associations with this species (Aquino, 1998; Leonard and Bennett, 1996).

The second encounter occurred on the Quebrada Tahuaillo on 22 June 2001 (04º 33'S, 73º 19'W) (Fig. 2) in swamp forest containing many *aguaje* palm trees (*Mauritia flexuosa*). The nearest settlement is Nuevo Jerusalem, a small Jivaro Indian village about 15 km downstream on the Río Tahuayo. At 1544 h, we heard a uakari troop moving through the canopy in the distance. When detected this troop was very quiet, with few contact calls as it traveled slowly towards us in the mid- to upper-level of the canopy. The troop numbered approximately 80 individuals spread over some 100 m, foraging as a single unit. It contained a mix of age/sex classes, including at least two infants each clinging dorsally to adult females.

We saw three individuals feed on *aguaje* fruits by clinging to the side of a strand of hanging fruits, one individual at a time. When one climbed away, another would take its place, plucking a fruit, eating it for a second or two, then dropping it. As the uakaris traveled and fed in the middle and upper canopy, they dropped so many fruits from several different species of trees that it sounded like heavy rainfall. As the troop eventually became aware of us, it moved off at a faster pace—but not as hurriedly, or noisily, as the troop encountered earlier on the Quebrada Tangarana. The Tahuaillo troop seemed more tolerant of our presence, possibly because it was headed towards its sleeping trees. We followed it in a wide loop until it stopped moving at 1750 h, when the area suddenly became quiet. We waited until 1800 h (almost dark), when they were settled, before

approaching them. One individual was in a *machimango* tree (*Eschweilera* sp.), and a female with a juvenile was in a mimosa tree (*Mimosa* sp.), all three at approximately 25 m high. The uakaris covered a distance of approximately 2 km during our observations. Fruits they consumed during this time (identified by the guide) included those of *aguaje* (*Mauritia flexuosa*), *pashaco* (*Parkia* sp.), *naranjo podrido* (*Parahancornia* sp.), *machimango* (*Eschweilera* sp.) and *shimbillo* (*Inga* sp.).

These are the first documented sightings of *C. c. ucayalii* on the Quebradas Tangarana and Tahuaillo. The Quebradas Blanco and Tangarana run parallel to each other in an easterly direction into the reserve and are about 10 km apart (Fig. 2). Although based on a very small sample (n = 4), Leonard and Bennett (1996) estimated an average daily travel path of 7.3 km and a home range of 3,000 ha. Thus, it is possible that the Tangarana troop was the same one that others have seen in the Reserva Comunal Tamshiyacu-Tahuayo on the Quebrada Blanco. The Quebrada Tahuaillo troop, on the other hand, was southwest and outside of the RCTT, and so represents the first documentation of *C. c. ucayalii* between the black-water Río Tahuayo (west side) and white-water Río Yarapa.

The local *C. c. ucayalii* populations are hunted. On the Quebrada Blanco, we met a local hunter carrying a dead female that he had shot an hour's walk from our camp. The next day we searched unsuccessfully for the group. Later, two tourists informed us that they met a hunter carrying two dead red uakaris at the same campsite a few days after we left. As we returned from our surveying trip to Quebrada Tahuaillo we encountered a Jivaro Indian at Nuevo Jerusalem who told us he had shot three (a male and two females, one with an infant) while hunting the previous week. Infant red uakaris are kept as pets in this area. An employee at Tahuayo Lodge and a villager at Jaldar Village on the Río Yarapa each possessed a female infant. Four male *C. c. ucayalii*, two subadults and two juveniles housed at a lodge on the Río Yarapa, were all obtained as infants when their mothers were killed by Jivaro Indian hunters on the Río Tahuayo.

Subsistence hunting is important for indigenous peoples in Amazonia (Peres, 1990), and the larger cebids are especially vulnerable. They are preferred because the quality and quantity of their meat makes hunting them cost-effective. Their populations are the first to be depleted and, in some cases, locally extirpated, and the slow reproductive rates of many cebids may hinder their chances of recovery (Mittermeier, 1987; Peres, 1990). Populations of the larger primates in the Río Tapiche basin and the Quebrada Blanco-Río Yavari corridor have declined dramatically. Puertas and Bodmer (1993) reported that the biomass of cebids in the more populated Tahuayo-Blanco area was only about half that of the less populated Río Yavari-Miri area, while that of callitrichids was similar. Over an 18-year period, populations of the larger primates in the Tapiche basin have also declined, while those of smaller primates stayed constant (Bennett *et al.*, 2001). Red uakaris may now be experiencing the same fate as the larger primates, due to being 'next in line' in terms of body mass after the woolly (*Lagothrix* sp.), spider (*Ateles* sp.), and howler (*Alouatta* sp.) monkeys. Based on our observations and verbal accounts of hunted red uakaris around the Reserva Comunal Tamshiyacu-Tahuayo area, and our encounter with only one troop of woolly monkeys and no howler or spider monkeys, we believe that this is exactly what is happening. The *C. c. ucayalii* population in this area may be seriously threatened.

A management plan developed in the early 1990s as part of the conservation program for the Reserva Comunal Tamshiyacu-Tahuayo proposed that local market-hunters harvest only male artiodactyls and large rodents. Primates are apparently hunted mainly for subsistence rather than for sale in the market, and the model depended on substituting them with female artiodactyls and large rodents. It was hoped that this strategy would limit hunting of primates (Puertas and Bodmer, 1993), but from our observations this is not evident.

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Chest Circumference Differs by Habitat in Costa Rican Mantled Howler Monkeys: Implications for Resource Allocation and Conservation

Clara B. Jones

Introduction

Primates exhibit a significant degree of morphological variability within species (Fleagle, 1999); however, few studies have quantified this variation in relation to habitat differences, or examined its consequences. With the exceptions of human beings (*Homo sapiens*: e.g. Sundaram *et al.*, 1995) and, arguably, the genus *Pan* (Boesch *et al.*, 2002) and howlers (*Alouatta* spp.: e.g. Crockett, 1998; Jones, 1997), the functional ecology underlying phenotypic plasticity has received little attention by primatologists (but see Kappeler and Pereira, 2003; Jones and Agoramoorthy, 2003). In this brief communication, I present data showing that chest circumference is significantly smaller in adult male and female Costa Rican mantled howler monkeys (*Alouatta palliata*) in severely degraded habitat. These results have important implications for the conservation of threatened primates. Moreover, they may indicate the existence of developmental tradeoffs between energetic investment in cardiopulmonary structures on the one hand, and survival, growth, and/or reproduction on the other.

Methods

Morphometric data (weight, tail-to-crown length, length of tail, length of pubis, length of arm, circumference of chest, in addition to age) were collected in the mid-1970s at Hacienda La Pacifica, Cañas, Guanacaste, Costa Rica (10º18'N, 85º07'W) by Dr. Norman J. Scott, Jr. and his assistants, including the present author (Scott *et al.*, 1976). Marked animals (120 adult females, 36 adult males) were censused and measured in three habitats of tropical dry forest (Frankie *et al.*, 1974): riparian (canopy cover estimated at 65-100%), deciduous (canopy cover 40-75%), and a degraded secondary habitat contiguous to irrigation ditches (canopy cover 10-45%), which were constructed consequent to anthropogenic perturbation for the purposes of farming and cattle ranching. Some of the numbers (n) reported below are smaller than the total numbers of individuals for each sex measured because some data sheets were incomplete. *Alouatta palliata*, which has been classified as a "diurnal arboreal folivore", is wholly herbivorous (primary consumer), preferring new leaves, flowers, and fruit (Crockett and Eisenberg, 1987; Glander, 1975; Jones, 1996). All tests are two-tailed.

Results

For the sample as a whole, there was no significant difference between habitats in the proportion of each of four age classes represented in the sample (Chi Square test of independence: $\chi^2 = 6.6985$, df = 6, p = 0.350). There was a highly significant correlation between weight (g) and habitat for males (r = -0.5424, p < 0.003, n = 21) but not for females, possibly consistent with the view that females are "energy maximizers" (Schoener, 1971), working to obtain some threshold level of nutritional requirements despite variations in habitat quality. Males in the (presumably) poorest habitat (irrigation) weighed, on average, less than (5333.13 g, n = 15) males in riparian (5912.00 g, n = 10) or deciduous (5755.45 g, n = 11) habitat, a comparison approaching significance ($F_{2,33} = 3.1413$, p = 0.056), supporting the view that males are not investing a significant portion of their "fitness budget" in feeding (Schoener, 1971; also see Trivers, 1972). On average, female weight did not differ by habitat (irrigation: