

Flock sizes of Parrots recorded in a *terra firme* lowland rainforest in Parque Nacional Yasuní, Ecuador

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Gruppengröße bei Papageien im Terra-Firme-Regenwald im Yasuní-Nationalpark in Ecuador

Bei 149 Sichtungen von Papageiengruppen wurden insgesamt 560 Individuen gezählt, die sich auf 12–13 Arten verteilten. Die größten Gruppen bildeten die Schmalschnabelsittiche (*Brotogeris cyanopectera*, *B. sanctithomae*) und die Grünzügelpapageien (*Pionites melanocephala*), andere Arten kamen oft nur paarweise oder in Familiengruppen vor.

Schlagworte: Papageien, Gruppengröße, Yasuní-Nationalpark, Ecuador.

Summary

A total of 149 observations of parrot flocks included 560 parrots distributed in 12–13 species. The largest flocks formed the *Brotogeris* parakeets (*B. cyanopectera*, *B. sanctithomae*) and the Black-headed Caiques (*Pionites melanocephala*). The other species often occurred in pairs or family groups.

Keywords: Parrots, flock size, Yasuní National Park, Ecuador.

1 Introduction

From the literature it is known that parrot flock size tends to vary during time of the day and month of the year (CHAPMAN et al. 1989). To examine variation in flock size on the same time of day, within several species of lowland rainforest parrots, a brief census was conducted in Ecuador.

2 Study area

Field observations were made in a small area of the 900.000 hectare Parque Nacional Yasuní in northern amazonian Ecuador. The National Park is laid out for oil exploitation to MAXUS-PETROECUADOR, and they have provided a good infrastructure within the park, which otherwise would only have been accessible by river (see PEARSON et al. 1978).

Surveys were made by walking along the gravel road, close to the scientific research station Estación Científica Yasuni (00° 38' S, 76° 30' W; 260 m a.s.l.), in sector 16 of the park. The forest was surveyed either on the road in direction toward NPF (Northern Production Facilities) or at the campstation Tivacuno (ROMOLEROUX et al. 1997).

The forest is tropical humid lowland rainforest of the *terra firme* type. *Terra firme* is the higher parts of the rainforest and a very high number of tree species has been found in this kind of habitat (VALENCIA et al. 1994), compared to the flood plains, gallery forest, or *várzea*.

Annual temperatures in Yasuni average 25.2 °C, and precipitation is 2,558 mm, with the driest months from December to February (126-142 mm) (ROMOLEROUX et al. 1997).

According to observations by RIDGELY et al. (1995), 18 species of parrots are found within the park area. The species are listed in table 1, and I have added the habitat preference of the species, according to literature (HILTY & BROWN 1986, FORSHAW 1989).

Table 1: Species found in P. N. Yasuni, Ecuador (RIDGLEY et al. 1995). Subspecies status according to FORSHAW (1989). Papageienarten im Yasuni-Nationalpark, Ecuador (RIDGELY et al. 1995). Unterarten nach FORSHAW (1989).

<i>Amazona farinosa (farinosa)</i>	humid forest, drier ground
<i>Amazona ochrocephala (nattereri)</i>	open or gallery forest
<i>Amazona amazonica (amazonica)</i>	open or gallery forest, swampy forests
<i>Ara ararauna</i>	humid lowland, gallery woodland
<i>Ara macao</i>	gallery forest, river banks, forest openings
<i>Ara severa (castaneifrons)</i>	humid lowland, forest edges, river banks, <i>várzea</i> or swampy forests
<i>Ara manilata</i>	Palm swamps (esp. <i>Mauritia</i>)
<i>Aratinga leucophthalmus (callogenyus)</i>	<i>terra firme</i> and <i>várzea</i> forest borders, river banks
<i>Aratinga weddellii</i>	humid <i>várzea</i> forests and swampy forests, river banks
<i>Forpus xanthopterygius (crassirostris)</i>	drier open woodland, second growth, river banks
<i>Forpus sclateri (sclateri)</i>	humid forest edge, second growth, river banks
<i>Brotogeris cyanoptera (cyanoptera)</i>	humid second growth, forest edges, river banks
<i>Brotogeris sanctithomae (sanctithomae)</i>	second growth, <i>várzea</i> and swampy forests, river banks
<i>Touit huetii (T. purpurata ?)</i>	humid <i>terra firme</i> and <i>várzea</i> forests
<i>Pionites melanocephala (melanocephala)</i>	humid <i>terra firme</i> forests and forest edge
<i>Pionus menstuus (menstruus)</i>	humid and wet lowland, second growth, clearings
<i>Pionopsitta barrabandi</i>	humid <i>terra firme</i> and <i>várzea</i> forests, clearings
<i>Pyrrhura melanura (souancei)</i>	forest borders, wide variety of zones

Some of the species were seen during time spent in the field, in the months before the census walks (e.g. *Aratinga leucophthalmus*), or simply on different times of day than the census walks, and are thus not included in the observations.

3 Results

A total of 149 observations of small flocks of parrots, were conducted from April 19th, 1995 to May 6th, 1995. In this period 14 afternoon census walks were made (starting between 13:15 and 17:15, and ending between 15:15 and 18:15), a daily average of slightly more than 2 hours were spent in the field, with a total of 30 observation hours.

The 149 flocks observed included a total of 560 parrots (table 2), distributed on 12-13 different species. The species of *Brotogeris* were *B. cyanoptera* and *B. sanctithomae*, but they were pooled together as some of the identifications characters during high altitude flight were rather uncertain at the species level.

On three occasions observations on *Amazona* could not be determined to species and they have been left in the *Amazona* spp. group.

The number of individuals corresponds to the total amount of birds seen in the flock, the mean number of individuals in each flock has been calculated with the standard deviation.

Attempts were made to divide the activity displayed. Categories chosen were flight, inactively perched, or actively perched and foraging. One flock could occur both in flight and perched at the same time.

Tab. 2: Table of observations, see text for explanation. – Liste der Beobachtungen (Näheres im Text).

	Number of individuals	Number of flocks	Mean number of individuals pr. flock	Flock observed in flight	Flock observed resting in tree	Flock observed foraging in tree
<i>Amazona farinosa</i>	19	10	1.9 ± 0.3	80 %	10 %	0 %
<i>Amazona ochrocephala</i>	6	4	1.5 ± 0.6	50 %	25 %	0 %
<i>Amazona</i> sp.	8	3	2.7 ± 1.1	67 %	0 %	33 %
<i>Ara ararauna</i>	46	18	2.6 ± 0.8	83 %	22 %	1 %
<i>Ara chloroptera</i>	5	2	2.5 ± 0.7	100 %	100 %	0 %
<i>Ara macao</i>	114	39	2.9 ± 2.0	79 %	36 %	13 %
<i>Ara severa</i>	77	26	3.0 ± 2.6	81 %	58 %	0 %
<i>Brotogeris</i> spp.	194	24	8.1 ± 8.2	79 %	29 %	17 %
<i>Pionites melanocephala</i>	42	8	5.3 ± 3.3	75 %	25 %	38 %
<i>Pionus menstruus</i>	25	8	3.1 ± 1.6	75 %	38 %	13 %
<i>Pionopsitta barrabandi</i>	3	2	1.5 ± 0.7	0 %	0 %	50 %
<i>Pyrrhura melanura</i>	19	5	3.8 ± 2.7	60 %	20 %	20 %
Total	558	149				
Average			3.7 ± 4.2	78 %	34 %	12 %

It is noted that e.g. scarce, but typical birds of the drier *terra firme* forest, like *Amazona farinosa*, were common (19 sights), while *A. amazonica* went unrecorded, a species usually seen in areas avoided by *A. farinosa* (FORSHAW 1989).

The macaws were seen frequently, but *A. chloroptera* with a striking low score, only five seen in two flocks. They were not seen on any other occasion during time spent in the field (from January to May). *Ara manilata* was not recorded from the area due to the lack of palm swamps, *A. ararauna* is also often found co-occurring with the stands of *Mauritia* palm, but were seen roosting in stands of *Iriatea deltoidea*. Both *A. macao* and *A. severa* were observed numerous times in large *Parkia* sp. trees, the later also seen in *Cecropia* sp. trees or in *Astrocaryum* sp. palms feeding on the seeds.

Larger flocks of *Brotogeris* were common crossing the road, feeding in *Dialium* sp. or *Tapira* sp. trees, a small group of *Pyrrhura melanura* was also observed feeding in the *Dialium* sp. tree.

Often *Pionites melanocephala* were observed feeding (38 % of the times observed) from the same *Gutteria* sp. tree species.

The parrots were observed by the end of the daytime in „foraging flocks“ to just before the „roosting flock“ hour. It is demonstrated from this, that flock sizes of all 12 species is significant different (Kruskal-Wallis $P < 0.01$). Within both macaws (*Ara* spp.) and amazon parrots (*Amazona* spp.) the various species, however, persisted of the same consistent flock size (*Ara* $P = 0.98$, *Amazona* $P = 0.08$), respectively for species of *Ara* 2.8 ± 2.0 and for species of *Amazona* 1.9 ± 0.7 .

The macaws were usually seen in single pairs, eventually accompanied by the last seasons offspring, or on a few times a larger number foraging (number of observations for *A. macao*, $N = 11$, and *A. severa*, $N = 14$).

Obviously the largest flock size was found within the species of *Brotogeris* (8.1 ± 8.2) and *Pionites melanocephala* (5.3 ± 3.3). It is also seen, that when these groups are removed from the analysis, flock size of the remaining species is tested significant identical ($P = 0.19$).

Most of the afternoon flocks, would either be seen in flight crossing the road, perched nearby or setting of or landing from nearby trees. In fact a total of 78 % of the observed flocks would be moving after a short while, while only a total of 12 % of the flocks would forage during these afternoon observations.

4 Few notes on nesting

According to FORSHAW (1989), breeding season tends to vary from late November and forth to April, or even later, for the species in question. Though nest activity was

observed for several species, none of the nests under observation and later measured during the census did host nestlings. Along the census route I observed nests of *Amazona farinosa*, *Ara macao*, *Ara severa*, and *Brotogeris* sp., and of these I managed to measure three nests from the route (table 3: *Ara macao* # 1, *A. severa* # 1, *A. severa* # 2) and an additionally two located in other parts of in the surroundings of ECY (*A. macao* # 2, *A. macao* # 3).

Table 3: Data from parrot nest trees in P. N. Yasuní, Ecuador. – Daten von Papageienbrutbäumen im Yasuní-Nationalpark, Ecuador.

	Height from ground	Entrance hole	Status of tree
<i>Ara macao</i> # 1.	48.6 m	22.2 m	Living
<i>A. macao</i> # 2.	55.3 m	31.4 m	Living
<i>A. macao</i> # 3.	25.3 m	25.3 m	Dead
Average	43.1 ± 15.7	26.3 ± 4.7	
<i>Ara severa</i> # 1.	25.3 m	16.8 m	Dead
<i>A. severa</i> # 2.	20.7 m	14.3 m	Dead
Average	23 ± 3.3	15.6 ± 1.8	

The nest tree for *Ara severa* # 2 turned over early march 1995, and made it possibly to measure the depth of the nest from the nest entrance to 0.7 m.

5 Concluding remarks

Yasuni being a fairly unspoilt rainforest with few, but increasing, disturbings for the moment, has a wide range of parrots. Including *Ara chloroptera*, unrecorded in Ecuador for the last many years (RIDGELY et al. 1995), several species otherwise rarely found in large numbers, like *A. macao* and *A. ararauna*, are common and usually found in small flocks, as have been reported for macaws previously (FORSHAW 1989). - Only *Brotogeris* is seen in large flocks, though roosting flocks of *Pionites melanocephala* are seen in numbers.

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