

## **THE PARANA PINE FOREST PROJECT: ARGENTINA**

### **Second Rufford Small Grant For Nature Conservation Final Report - May 2007**

Kristina Cockle (RSG 31.02.06, received in June 2006)

#### **SUMMARY**

In Argentina's Parana Pine forest, some 30 globally threatened bird species coexist with one of the poorest farming communities in the country. Many of these birds are threatened by habitat loss and nest-robbing, both of which can be reduced through applied research and environmental education. In 2006-2007, we began to determine nest site requirements for threatened cavity-nesting birds, involved farmers and local students as participants, continued to study the natural history of rare and threatened Parana Pine forest birds, and evaluated nest-boxes as a conservation and outreach tool.

#### **MAJOR ACTIVITIES AND RESULTS**

##### **Are cavity-nesting birds limited by the number of cavities available?**

Nearly all remaining Atlantic forest has been subject to selective logging of its large trees, with potentially severe consequences for cavity-nesting birds. Logging may affect cavity availability directly, by removing potential nest sites. It may also have indirect effects, analogous to trophic cascades, if, by reducing population size of excavators, logging reduces the number of cavities created.

We examined the availability of potential nest sites for cavity-nesting birds in the Parana Pine Forest. (1) We installed eight 1-ha experimental plots in primary and logged forest, and found all potential cavities inside the plots. (2) We searched for cavity nests in three parks and on five farms, and confirmed a total of 32 active nests and two active roost holes of 19 species of birds. (3) We installed 26 nest-boxes in a pilot experiment in Araucaria Provincial Park. Thirteen of these boxes were used by three species of birds and one species of marsupial.

We found very low occupancy of natural cavities in primary and logged forest, overall, but relatively high occupancy of (1) deep natural cavities with small entrances, and (2) deep nest boxes with small entrances. These characteristics may help birds avoid nest predation. Selectively logged forest supported significantly fewer cavities than primary forest. Relatively few (20-30%) natural cavities were created by woodpeckers; the rest were created by damage or decay processes, suggesting little potential for cascading effects if excavators decline. However, although excavators may be less important than in North American systems, cavities may be limiting for birds requiring deep holes with small entrances, particularly in logged forest, and further studies should examine the importance of cavity quality, and non-avian agents of cavity creation.

I presented these first results on cavity-availability at a symposium on nest-site limitation in neotropical cavity-nesting birds. I co-organized the symposium with Cintia Cornelius, as part of the VIII Neotropical Ornithological Congress (May 2007, Venezuela). Two scientific papers reporting this work will be published in 2008, in the Proceedings of the VIII Neotropical Ornithological Congress (see below). We are now installing 15 nest boxes on each of four of our experimental plots, to determine whether adding nest boxes increases the breeding density of cavity-nesting birds.

### **Natural History and Distribution of Rare and Threatened Birds**

We searched for rare and threatened Parana Pine forest birds at several new sites in the Yabotí Biosphere Reserve. A local collaborator, ranger Claudio Maders, re-discovered the Black-capped Piprites (*Piprites pileata*) in Argentina after 47 years without records. We helped to document the discovery with a tape-recording and photo, and to disseminate the news in the local and national media. We also found the first nest for this species, an exciting discovery because its nest architecture (ball of moss) has important implications for its taxonomy. With Claudio, we recently observed and tape-recorded a juvenile, and we are searching for the species at other sites, in similar habitat (*Ocotea pulchella* forest). We also discovered the Brown-breasted Bamboo-Tyrant (*Hemitriccus obsoletus*), previously undocumented in Argentina, at several sites in the Yabotí Biosphere Reserve.

### **Status of Vinaceous Amazon Populations**

We conducted a second census of the Vinaceous Amazon population in this species' key area in Argentina: the rural area from San Pedro to Tobuna. From 19 to 22 March, every day from 6:00-9:00 AM and 6:00-7:30 PM, 18 volunteers counted all Vinaceous Amazons, from strategic points (telephone tower, water towers, hilltops), in a repetition of our 2005 census. This year, we counted 203 Vinaceous Amazons in three flocks: Tobuna (98), San Pedro (80), and Paraje Alegría (25). This is an increase from the 163 amazons counted in the same area, using the same technique, in 2005. This year, the census was organized by a local park ranger student, Mariana Welter.

### **Education and Outreach**

We included farmers and other local volunteers in all aspects of our field work. Four farm families (Juarez & Elsa Da Silva, Valdemar Barboza, Abilio Rodriguez, and Getulio Gonzalez) helped count Vinaceous Amazons this year during the census. Farmers also showed us cavity-nests that they found on their farms, and helped monitor the nests with binoculars and the pole-mounted video camera. Volunteers in the field included ten local farmers and their children, 26 park ranger students, six park rangers, and two teachers. These volunteers helped install plots, search for cavities, monitor nests, record data, install and monitor nest boxes, and measure chicks and eggs from nest boxes. Two elementary school classes (Grade 4), led by park ranger student volunteers, helped monitor nest boxes in Araucaria Provincial Park.

We continue working closely with the Park Ranger School in San Pedro. Volunteer work with our project is now included as an optional part of the curriculum for the courses 'Environmental Education' and 'Wildlife Management'. We co-presented a course 'Introduction to Observation of Birds' with the NGO Aves Argentinas (October 2006). Three

park ranger students (Mariana Welter, Carlos Carrió, and Nestor Fariña) are developing thesis projects within the framework of our research on Parana Pine forest birds.

We gave out two new numbers of our bulletin 'Boletín Macuco'. One explains our study of cavity-nesting birds, and the other gives results of the 2007 Vinaceous Amazon census.

Another organization, Fundacion Temaiken is now delivering teachers' workshops about conserving the Parana Pine forest. But it takes time and several examples before the teachers incorporate Parana Pine forest conservation into their regular curriculum. Thus, we are now putting together a group of volunteers from the park ranger school in San Pedro, to visit schools and work with students and teachers. So far, we have made a very successful visit to Tobuna Elementary School, organized by volunteers from the Park Ranger School. We also printed 200 copies of our teachers' manual, which we are giving to elementary school teachers and principals from San Pedro to Santa Rosa.

With help from local farmers, and at their request, we are developing a poster that shows how to help Vinaceous Amazons by leaving chicks in their nests and helping to protect nests on farms.

We are presenting a bi-weekly program on Radio María Reina, about conserving different animals of the Parana Pine forest.

All of our activities and results are reported to the Ministry of Ecology, every six months.

## SCIENTIFIC ARTICLES (THIS PHASE OF OUR PROJECT)

### 2007

Cockle, K., G. Capuzzi, A. Bodrati, R. Clay, H. del Castillo, M. Velázquez, J. I. Areta, N. Fariña, and R. Fariña. 2007. Distribution, abundance, and conservation of Vinaceous Amazons (*Amazona vinacea*) in Argentina and Paraguay. *Journal of Field Ornithology* 78: 21-39.

The Vinaceous Amazon (*Amazona vinacea*) is endemic to the Atlantic forest of southeastern Brazil, eastern Paraguay, and the province of Misiones in Argentina. We searched for this species throughout the western part of its range in Argentina and Paraguay during 1639 days of fieldwork from 1997-2006. Vinaceous Amazons have disappeared from most of the areas where they were historically recorded in these countries, and are now limited to a few sites in northeastern Paraguay and central Misiones (Argentina). We estimate the minimum remaining populations at 220 individuals in Paraguay and 203 individuals in Argentina. Important sites for the species are (1) the farming area from San Pedro to Tobuna (Misiones, Argentina), and (2) the Itaipú reserves complex and Reserva Natural Privada Itabó (Paraguay). In our surveys, Vinaceous Amazons were absent from the largest tracts of forest in Misiones. They were most often observed feeding, roosting, and nesting in small forest remnants and anthropogenic habitat. Threats in this habitat include nest poaching, forest clearing, and shooting as a crop pest. We confirmed 40 Vinaceous Amazons kept as pets in 35 homes between San Pedro and Tobuna. Environmental education and law enforcement are urgently needed to reduce threats in populated areas. Subsistence farmers need technical and logistical support to reduce clearing of forest for new crops. Finally, future studies should address the amazon's habitat preferences, its nest site requirements, and its demography in different habitats.

Maders, C., N. Fariña, and A. Bodrati. 2007. Rediscovery of the Black-capped Piprites (*Piprites pileata*) in Argentina. *Ornitologia Neotropical* 18: 127-131.

### 2006

Bodrati, A., K. Cockle, J. I. Areta, G. Capuzzi, and R. Fariña. 2006. The Blue-winged Macaw (*Primolius maracana*) in Argentina: from pest to extinction in 50 years?. *El Hornero* 21: 37-43.

Parrots are often considered crop pests; however, they differ from most pest species because they are K strategists (long lifespan, low fecundity). Such species are unlikely to recover easily from lethal control, which is often used to reduce their damage to crops. The Blue-winged Macaw (*Primolius maracana*) is virtually extinct in Argentina, and, although habitat loss has been cited as the principal cause of its disappearance, this is not a sufficient explanation. Based on 779 days of field work, interviews with local farmers, and the biology of the Blue-winged Macaw, we conclude that one of the fundamental causes of its disappearance from Argentina may have been lethal control by farmers.

Bodrati, A., and J. I. Areta. 2006. The Brown-breasted Bamboo-Tyrant (*Hemitriccus obsoletus*) in Argentina and comments on its habitat and distribution. *Ornitologia Neotropical* 17: 597-600.

## **In Review**

Cockle, K., C. Maders, G. Di Santo, and A. Bodrati. The Black-capped Piprites (*Piprites pileata*) builds a spherical moss nest. In Review, *Cotinga*.

The Black-capped Piprites (*Piprites pileata*) is traditionally included among the Manakins (Pipridae), but has recently been proposed as a Tyrant Flycatcher (Tyrannidae). We describe the first known nest for this species. It was a loosely woven sphere, composed of two species of moss (*Neckeropsis undulata* and *Orthostichella versicolor*), and carpeted, on the inside, with hyphae of *Marasmius* sp. fungus. The nest was placed 8 m high in a fork in the main trunk of a 'layana laurel' (*Ocotea pulchella*), in the riparian forest of the Arroyo Paraíso, in the projected Caá Yari Provincial Park, Misiones, Argentina. Only the female participated in the construction; the male always accompanied her, fluttering his wings in a display. The nest of *P. pileata* is very different from the typical cup nests built by members of the Pipridae, reinforcing the removal of the genus *Piprites* from this family. This nest is also very different from the cavity-nest mentioned for the Wing-barred Piprites (*P. chloris*), raising important questions about the relationship between these two species.

Cockle, K., K. Martin, and K. Wiebe. 2008. Availability of cavities for nesting birds in the Atlantic forest, Argentina. In Review, *Proceedings of the VIII Neotropical Ornithological Congress*.

In cavity-nesting birds, reproduction depends on a key resource – tree cavities – that may limit populations and structure communities. We test the hypothesis that selective logging reduces nest site availability and nest density for cavity-nesting birds in the Atlantic forest by determining (1) whether suitable cavities are as abundant in logged as in primary Atlantic forest, and (2) the proportion of these cavities occupied by nesting birds. From September to December 2006 (breeding season) we found all potential cavities with  $\geq 2$  cm entrance diameter, in four 1-ha plots in each of primary and selectively logged forest in San Pedro Department, Misiones, Argentina. Potential cavities in the understory and midstory (below 15 m) were inspected using a pole-mounted video camera to determine suitability and use by nesting birds. For each suitable cavity, we determined the cavity-making agent, entrance diameter, and internal depth. Potential cavities in the canopy (above 15 m) were watched to detect signs of nesting. We also placed 26 nest boxes in logged forest at a nearby site, and measured 23 active cavity nests outside our plots. Overall, primary forest contained significantly more potential cavities/ha than logged forest. Suitable understory and midstory cavities did not differ statistically in density between forest types (overall mean  $4.6 \pm 3.0$  /ha), but potential cavities in the canopy were significantly more abundant in primary forest than in logged forest. In primary forest plots, only one (5 %) of the suitable understory and midstory cavities and two (8 %) of the potential canopy cavities were occupied by nesting birds. In

logged forest plots, no natural cavities were occupied. However, 13 of the 26 nest boxes were occupied in logged forest. Natural cavities with characteristics similar to our nest boxes ( $\geq 20$  cm deep and  $\leq 14$  cm entrance diameter) accounted for nine (36%) of the 25 natural nests measured; however, cavities conforming to these characteristics were rare on plots in primary forest ( $1.3 \pm 1.0$  cavities/ha) and rarer still in logged forest ( $0.5 \pm 0.6$  cavities/ha). Thus, although low occupancy might seem to suggest that cavities are not limiting, high quality cavities, with particular characteristics, may indeed be rare, and may limit populations of some cavity-nesting birds in the Atlantic forest of Argentina.

Bodrati, A., C. Maders, and G. Di Santo. Current knowledge of the Black-capped Piprites (*Piprites pileata*) in Argentina. In Review, Nuestras Aves.

Bodrati, A. New localities for the Brown-breasted Bamboo-Tyrant (*Hemitriccus obsoletus*) in Argentina. In Review, Nuestras Aves.

Maders, C., A. Bodrati, K. Cockle, G. Pugnali, and G. Di Santo. The Amethyst Woodstar (*Calliphlox amethystina*) in the projected Caá Yará Provincial Park, Province of Misiones, Argentina. In Review, Nuestras Aves.

Cornelius, C., Cockle, K., Politi, N., Berkunsky, I., Sandoval, L., and K. Martin. 2008. Cavity-nesting birds of Neotropical forests: Are they limited by nest-sites? In Review, Proceedings of the VIII Neotropical Ornithological Congress.

## EXPENSES

Exchange rates averaged over the project: US\$ 1 = £ 0.525; ARG\$ 1 = £ 0.170.

	<b>Budgeted from RSG</b>	<b>Spent (RSG)</b>	<b>Spent (other sources*)</b>	<b>To Spend (RSG, May-June 2007)</b>
minor equipment and tools (e.g. ladder, paint brushes)	£42	£142	£262	-
food and accomodation in Misiones	£2249	£1801	£392	£548
vehicle and fuel: £0.11/km x 8197 km	-	£532	£370	£50
bus (Buenos Aires-San Pedro for part-time volunteers): £23/ return trip x 15 trips.	£777	£345	-	£69
educational materials (art materials, props, etc.)	£207	£73	-	£20

field supplies (batteries, paint, first aid, string, tape, etc.)	£156	£76	£10	£15
nest-boxes (materials and labour from local carpenter): £10/box x 40 boxes	£400	£400	-	-
Macuco Bulletin (local dissemination of results): £0.05/bulletin x 2 numbers x 200 copies/number	£25	£20	-	-
teachers' manual	£700	£178		
communication, report production and computer supplies	£331	£335	£35	£92
accident insurance	£113	-	-	-
posters	-	-	-	£304
<b>Total</b>	<b>£5000</b>	<b>£3902</b>	<b>£1069</b>	<b>£1098</b>

\*additional funding sources were British Ornithologists' Union, Cleveland Metroparks Zoo, Columbus Zoo, and Oregon Zoo Future for Wildlife Program.