



HOME RANGE SIZE AND POST - RELEASE MOVEMENTS OF REINTRODUCED RED - BILLED CURASSOWS *CRAX BLUMENBACHII* AT RESERVA ECOLÓGICA DE GUAPIAÇU (CACHOEIRAS DE MACACU, RJ, BRASIL)

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INTRODUÇÃO

The red - billed curassow *Crax blumenbachii* is a cracid, endemic form the eastern Atlantic Rain Forest. Originally it was distributed in the lowland forests of Rio de Janeiro, Minas Gerais, Espírito Santo and south Bahia. Today they are only found in 6 areas of Bahia and 2 in Espírito Santo (IBAMA 2004), in no more than a total of 250 individuals. It is considered an endangered species by IUCN/ Birdlife because it was vanished from its habitat mainly due to hunting and deforestation.

In the 70's a captive breeding program started at Crax Brasil breeding center (Contagem, MG, Brasil), and nowadays reintroduction is possible. In May 27th 2003, the species was officially considered threatened by extinction in Brazil. In 2004, the Action Plan for the red - billed curassow listed the most important actions to recover the species from its endangered conservation status, including reintroduction programs and long - term monitoring of the released birds. During the 1990's, three reintroduction programs occurred in Minas Gerais state, Brasil, but post - release monitoring were done only by eventual direct observations of the released individuals.

In 2006 a reintroduction program started at the private area 'Reserva Ecológica de Guapiaçu' (hereafter REGUA, RJ, Brasil), with all the individuals tagged with backpack design (which weighted 46g each). Until 2008, 48 tagged birds were reintroduced in the Atlantic Rain Forest at REGUA. All the reintroduced birds were monitored with telemetry to describe their fates and movements, once the success or failure of reintroductions is dependent upon the process acting during the establishment phase immediately following release, as well as population dynamics processes such as long - term survival rates and breeding success (Armstrong *et al.*, 999). Home range size and movements after release was

considered in this study to evaluate spatial use of the reintroduced red - billed curassows and to gain insight into the animal's cognitive map of its habitat (White & Garrot 1990, Kenward 2000). No consensus exists for a single and precise definition of 'home range'. In this study, the home range was defined as in Burt (1943), e.g. the area traversed by an animal in its activities; the core area was defined as the areas used more frequently than any other areas within the home range, which probably contain the homesites, refuges and most dependable food sources (Samuel *et al.*, 1985). The home ranges were quantified over biologically meaningful periods of time, which corresponded to periods of time after their release in the wild. The results improve our understanding of how animals conceive and perceive where they live and basic biological information about the species will be relevant for future reintroductions of the species.

OBJETIVOS

We assessed home range size and movement patterns of the reintroduced red - billed curassows at REGUA, in relation to 4 periods after release (1 to 6 months, 7 to 12 months, 13 to 18 months and 19 - 24 months after release).

MATERIAL E MÉTODOS

REGUA is a private land with almost 8,000 ha inside Atlantic Rain Forest, which ranges from 100 to 2,000 m a.s.l. It is regularly patrolled by 8 park rangers, who inhibit the action of poachers. In the Action Plan of the red - billed curassows (IBAMA 2004), REGUA is indicated as a suitable habitat for the reintroduction of the cracid. It is adjacent

to Três Picos state Park, which covers an area of 46,000 ha in the Atlantic Forest(RJ, Brasil)

The triangulation protocol method was used to assess locations of the reintroduced red - billed curassows. Every curassow had radio transmitter, which battery lasts 2.5 years. They were quickly located in a standardized order, starting with a different bird each day. The schedule avoided repeated locations of birds at the same time of day and allowed to monitor all the birds that were interacting with each other in the same region.

From August 2006 to July 2008, we considered data from 22 birds which were monitored from 6 to 24 months after release at REGUA (RJ, Brasil).

Our sample data is the number of individuals, and in each period an average of 50 locations per individual were considered. We did not consider data from birds that died or the signal was lost in less than 6 months after release. The released groups ranged from 2 to 10 individuals, and each group was released prevalently during the spring seasons of 2006 and 2007.

The home range size was calculated by Cluster Analysis, choosing single inclusive convex polygons(Ranges VII software)(White & Garrot, 1990; Kenward, 2000). A home range including 95% of the locations was considered a total home range size; a home range including 50% of the locations was considered a core area and this was defined through the analysis of utilization plots. The center of each polygon and the distances were calculated by using ArcGis 9 software. We used hand - held Yagi antennas and receivers (Sika, Biotrack®), UK) during 24 consecutive months (August 2006 to July 2008).

RESULTADOS

Until 6 months post - release the birds moved near the site where they were released: the mean home range size was 279.5 ha (n=22), the core area size was 52.8 ha, and the mean center of the core area was located 573.7 m in relation to the release site (ranging from 29.5 m to 1.7 km). From 7 to 12 months post - release, the birds used a larger area in relation to the other periods (n= 16, mean home range size = 750.7 ha, core area = 212.8 ha). The center of the core area was 1.8 km distant from the release site (ranging from 968 m to 3 km).

After 1 year (13 - 18 months post - release) the birds reached the breeding age (>2.5 years - old), once they were released with 1.5 years - old. In this period the mean home range size was 495.5 ha and the core area size was 71.5 ha. The mean center of the core area in this period was located 2.7 km apart the release site (ranging from 1.3 to 7.2 km). From 19 to 24 months the mean home range size was 287.1 ha (n=5), the core area size was 112 ha, and the mean center of the core area was located 2.6km in relation to the release site. The birds predominantly moved to southwest and southeast, by using lowland forest. They also used highland forest (between 700 - 1000m) to deslocate to other plain areas.

These kind of information is crucial for planning other reintroductions and projects about conservation of red - billed curassows. There are no published information about home range size of other cracids,

CONCLUSÃO

The majority of the reintroduced red - billed curassows stayed relatively near the release site for half a year post - release. After 7 to 12 months in the wild, the birds presented the biggest home range size, suggesting excursive movements to explore the area. After 1.5 - 2 years in the wild, the red - billed curassows reduced their home range sizes but a set of factors must be investigated to mention territory establishment.

It is fundamental to monitor animals post - release to evaluate the characteristics which will determine success or failure in the long - term. The home range size of reintroduced animals and its variation over time and space is one of the data which allows evaluation of the process acting during the establishment phase immediately following release, as well as long term - processes such as territory establishment and pair bonds (Armstrong *et al.*, 1999).

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