

of marked oryx (collared) present in the protected area and increasing the proportion of marked animals in the population have been two important management / monitoring activities during the previous months. The population estimate we provide is derived from a number of marked animals recorded for the 12 months prior to the count, a reasonably accurate estimation of the total number of marked oryx present in the surveyed area during the census. Although 149 oryx have been re-introduced into the protected area, a number of them have died due to inefficient adjustment to the new environment, starvation during the 1999-2000 drought period, poaching, and intra-specific fights. We estimate that 75 (50%) of them have survived. The oryx population at 'Uruq Bani Ma'arid is therefore composed of 60% wild-born individuals, a great asset to the population if one assumes that wild-born individuals are better adjusted to the environment than captive-bred oryx and that their capacity to survive harsh conditions is presumably optimized. Population estimates were consistent with results of routine monitoring carried out throughout 2003. When comparing with previous population estimates carried out respectively in July 2001 and August 2002, the present estimate was slightly higher than in 2002 and similar to results of 2001. However, the relatively large 95%CI (i.e. 169 - 237) observed in 2003 compared to 2001 (i.e. 182 - 216) and 2002 (i.e. 164 - 202) limits our predications of population trends.

To the best of our knowledge the population has not suffered a significant decrease or increase since August

2002. The reasons for a lack of increase of the population could be several, ranging from an underestimation of death rate (undetected poaching or environmental stress deaths), the existence of an emigration trend, the presence of wild-born oryx in non surveyed areas, a population that has already reached a demographic equilibrium with the environment, a positive but slow growth rate difficult to demonstrate on the short term. Many more years of monitoring might be necessary to clarify this demographic issue.

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## Re-introduction of black rhino to Zambia

**F**ive black rhino (*Diceros bicornis minor*) were re-introduced into Zambia's North Luangwa National Park (NLNP) on 28<sup>th</sup> May 2003. The status of black rhino in Zambia prior to this re-introduction was 'Presumed Extinct', with the last confirmed sighting of an animal in the early 1990's. In historical times Zambia was one of the black rhino's most important range states, and the Luangwa Valley, with an estimated population of up to 12,000 animals in the early 1970's, one of its strongholds in the country. The Frankfurt Zoological Society (FZS) has been supporting the Zambia Wildlife Authority (ZAWA), in the management and conservation of North Luangwa National Park since 1986, through its North Luangwa Conservation Program (NLCP). This long-term partnership has resulted in effective security and management systems being in place and the re-introduction of black rhino was a logical next step in conservation activities in the park. A positive evaluation of the habitat and security of NLNP by the Southern African Development Community (SADC) Regional Program for Rhino Conservation in 2001 set the stage and a formal proposal by ZAWA and NLCP was presented at the IUCN/SSC Rhino Specialist Group meeting in May 2002.

#### Release site

An area in the central area of the park, straddling the Lubonga River, was chosen as the site for the sanctuary in which the re-introduced rhinos would be released. The site's location was based on historical distribution data for black rhino in NLNP, as well as security considerations. A low-impact, 4-strand electrified fence was erected to contain the rhino in this 55 km<sup>2</sup> area, while allowing for relative freedom of movement for other animals. Additional ZAWA wildlife police officers were seconded to the area, and received extra

training to deal with rhino security.

#### Release

In an agreement mediated by FZS, South African National Parks donated 5 animals to the Zambia Wildlife Authority in exchange for two zoo-born black rhino calves from Frankfurt Zoo. The animals destined for Zambia were captured in Marakele National Park and Kruger National Park in March of this year, and the two males and three females were flown to North Luangwa National Park just over two months later. During their time in the bomas in NLNP, they were outfitted with radio transmitters in their horns, and received a trypanosomiasis inoculation, active for three months, to ease their introduction into a tsetse fly area. Tsetse targets and traps were also deployed at a low density throughout the sanctuary area, and at a high density around the boma site to initially reduce the tsetse population to allow the animals time to develop resistance to the tryps parasite.

#### Post-release monitoring

The animals were released into the wider sanctuary area from their bomas after a period ranging from 2 ½ to 4 weeks, and have settled down well and none have broken through the perimeter fence. Their movements were predominantly monitored by plane for the first 6 weeks after release to keep disturbance to a minimum, although monitoring by foot patrol will become more important in the coming months. Data on the animals and their movements are being entered into the WildB database, developed by the SADC RPRC program. This re-introduction of 5 animals is just the 1<sup>st</sup> phase of the project, which aims to achieve a

minimum of 20 founder animals within NLNP within 3 years. The project has been a big step forward for conservation in Zambia, as well as being a success for regional cooperation in black rhino conservation.

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## Ecology of re-introduced Andean bears in the Maquipucuna Biological Reserve, Ecuador: conservation implications

One of the many gaps that still exist in the knowledge of Neotropical mammals is the Andean bear which is better known as the spectacled bear (*Tremarctos ornatus*). The few studies that have been carried out have been based on evidence of bear activity e.g. tracks, excrement, foot prints, scratches, etc. Although such evidence can certainly add to our understanding, records of visual observation are the most reliable data for interpreting spatial patterns and factors in habitat selection. The objective of the present study was to increase the limited knowledge that exists about the ecology of this species and to acquire experience in re-introducing the Andean bear. To fulfill this objective it was decided to rehabilitate and release three individuals in the Biological Reserve Maquipucuna and then track them after release by means of ground radio telemetry.

#### Methodology

This study was carried out in the Maquipucuna Biological Reserve, in the cloud forests of the western slope of the Andes, in northwestern Ecuador. The Reserve covers 45 km<sup>2</sup>, surrounded by a protective forest of 140 km<sup>2</sup> and the altitude ranges from 1200 to 2800 m. Annual temperatures vary between 10 and 20°C. In 1995, three juvenile bears were selected, two females and a male named Chiquita, Tuta and Paddington respectively. The bears were born wild but their origins were unknown. At 4 to 5 months of age, the authorities confiscated them from people who had kept them as pets in southern Ecuador. The bears entered the program when they were approximately 17 months of age and following the procedures recommended by IUCN (1987) for re-introduction programs, and after 8 months of rehabilitation, the bears were released. Each released bear wore a radio-collar with a movement sensor and the primary purpose of the telemetry was to allow researchers to approach the animal.

During eight months of monitoring each bear was tracked 8 days per month for 12 hours a day, generally from 06:00-18:00 hrs. Only two bears were successfully tracked because Tuta took off her radio collar after release. When an animal was sighted the trackers kept a distance of approximately 30 m and watched through binoculars, although in some instances we surprised the bear at distances as close as 5 m. Each activity the animal carried out was recorded and with

the exact time where it happened. The behavior was only documented when the bear did not notice our presence and we assumed that the animal had discovered the investigator's presence when it began to smell and scrutinize the area in search of intruders. We opted not to bother the animal and did not record this possibly slanted data of their behavior.

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#### Results

The study bears were followed for eight months which resulted in 127 sightings between 5 and 30 m, for a total of 1,440 minutes of direct observation, the study bears used 70.2% of their time eating, 19.7% walking and 9.1% resting. Paddington had a home range of 61 Km<sup>2</sup> and a core range of 24.9 km<sup>2</sup>. These ranges are 15 and 7 times bigger, respectively, than those of Chiquita at 4.1 km<sup>2</sup> and 3.5 km<sup>2</sup>. The olfaction of these animals is extremely sensitive and they can perceive from ground level when a tree is loaded with ripe fruits. Their hearing is moderate and vision is not good and on several occasions we observed them from the top of a 3 m high tree and they appeared restless, constantly sniffing in search of intruders, but they were never able to locate the observer. When threatened or surprised on the ground, the bears stood erect on their back paws or they stopped to look for the intruder. Once the danger was located, and if it was close, they ran away or climbed the nearest tree. The bears crossed torrential rivers with very little effort and this was recorded on four occasions for Paddington and two for Tuta. Six different types of sounds were also detected. Eight terrestrial nests and two arboreal nests were built by the study bears and were