

Reintroduction of the critically endangered Antigua racer *Alsophis antiguae* to Green Island, Antigua

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SUMMARY

Between 2002 and 2005, a total of 46 Antigua racers *Alsophis antiguae* were introduced to Green Island. A radio-telemetry study undertaken in 2003 of four of the founding females, confirmed the racers were adjusting well to their new environment. Young snakes were first observed in 2005.

BACKGROUND

The Antigua racer *Alsophis antiguae* is a harmless colubrid snake which used to be abundant throughout the Lesser Antillean islands of Antigua (and its satellite islands) and Barbuda (total area of 440 sq km). It is an ambush predator, feeding mainly on Watts' anole *Anolis wattsi*, spotted anole *Anolis leachi*, and Antigua ground lizards *Ameiva griswoldi*. It is a diurnal, ground dwelling species with a preference for habitat with a dense canopy cover, undergrowth and an accumulation of leaf litter.

In the late nineteenth century the Asian mongoose *Herpestes javanicus* was introduced to Antigua in order to control the non-native, invasive black rat *Rattus rattus* which was destroying European settlers' sugar cane *Saccharum officinale* crops. The mongooses had negligible impact on the rats, instead preying on the more easily captured endemic species and decimated the population of Antigua racers. Antigua racers persisted for a few more decades on some mongoose-free offshore islands, but by the 1980s, they were confined to a single islet, Great Bird Island (9.9 ha in area) 2.5 km off the north-east coast of Antigua. This islet represented less than 0.1% of the species' original range. Awareness of the plight of the Antigua racer was raised in 1991 in an article in the journal *Oryx*, and the species was listed by IUCN as Critically Endangered in 1996.

In 1995, a survey was undertaken on Great Bird Island to assess the status of the Antigua racer. The survey estimated the population size to be approximately 51 adult and sub-adult

racers. Non-native black rats were common and identified as a serious threat to the racer population. As a result, the Antigua Racer Conservation Project (ARCP) was created and the decision made to eradicate rats from Great Bird Island (see Daltry 2006a for rat eradication, and Daltry 2006b for the resulting racer population increase).

To avoid having the racer population confined to one small islet and the associated risks of extinction that this posed, and to allow the population to increase, it was considered important to establish more populations on suitable islands within the species' historical range. A reintroduction plan was developed by ARCP in 1999, and officially endorsed by the IUCN/SSC Reintroduction Specialist Group in the same year. The goal of plan (still under implementation) was to reintroduce Antigua racers to at least four islands in order to establish a population of at least 500 breeding adults. The first reintroduction took place in November 1999, when Antigua racers were translocated from Great Bird Island to neighbouring Rabbit Island (see Daltry 2006c). This case study outlines the second reintroduction of racers, this time to Green Island.

ACTION

Reintroduction site: Building on the success of the first Antigua racer translocation to Rabbit Island, Green Island was selected as the second reintroduction site, in accordance with the ARCP Antigua Racer Reintroduction Plan (1999). Green Island is one of the largest and most diverse of Antigua's offshore islands,

situated of the east coast. This 43 ha (106 acres) island contains the largest surviving fragments of coastal forest in Antigua. The Antiguan racer was extirpated from the island approximately 30 years ago.

Green Island was selected as a reintroduction site for a number of reasons:

- 1) Many areas are over 5 m above sea level, therefore less susceptible to flooding during hurricanes compared to other lower-lying islets.
- 2) There is a diversity of suitable habitats, including littoral forest, sandy beaches and rocky cliffs (similar to Great Bird Island). The dense tangle of thorn bushes and agaves that cover most of the island is also a deterrent to people.
- 3) There is a high diversity and density of prey species.
- 4) The island is uninhabited and, though privately owned, is protected from development by a 99-year covenant.
- 5) It is relatively large in size, therefore has the potential to support several hundred racers.

However, black rats were abundant on Green Island, and may have contributed to the racer's extinction in the 1970s through direct predation and competition for prey. The ARCP therefore conducted a rat eradication in 2002. At 43 hectares, this is the largest island to have been cleared of rats in the Caribbean.

Reintroduction and monitoring: In 2002, nine wild Antiguan racers were selected from Great Bird Island and one from Rabbit Island, to found the new Green Island population. There were seven females and three males, ranging in size from 510 to 732 mm snout-vent length and 52 to 240 g in weight. The racers were put into cotton bags for transport to Green Island. A 2 mm tissue sample was cut from the tail tip of each and stored in 75% ethanol for DNA studies. The racers were then taken by boat to Green Island and released in suitable looking habitat.

Four of the female racers from Great Bird Island were surgically implanted with epoxy-coated miniature radio-transmitters (SB-2 model, Holohil Systems Inc), and were subject to a radio-telemetry study throughout 2003. Technological advances have increased the lifespan of the transmitters used to more than

one year. Local researchers and volunteers regularly located the snakes and mapped their movements and habitat use across the island using GIS. Where possible without disturbing the racers, researchers attempted to see the snakes to ascertain if they were still healthy. Towards the end of the telemetry study, two of the radio-tagged females were re-captured and found to have increased significantly in weight and length.

Subsequent releases: In 2003 and 2004, a further 20 Antiguan racers from Great Bird Island (11 individuals) and Rabbit Island (9 individuals) were released on Green Island. All racers selected were adults, ranging in size from 485 to 880 mm snout-vent length and 52 to 278 g in weight. A variety of size classes was desirable in order to establish a population that had something resembling a natural demographic structure and to minimise the competition for food between individuals (snakes of different sizes eat lizards of different sizes). Individuals that were injured, underweight or suspiciously easy to catch were rejected from selection.

To boost the population further, 16 racers were translocated from Great Bird Island to Green Island in 2005. Additional releases are planned in 2007.

CONSEQUENCES

Reintroduction success: The radio-telemetry study undertaken in 2003 of four of the founding females, confirmed the racers were adjusting well to their new home. This study was considered sufficient to demonstrate that Antiguan racers could survive and thrive on Green Island.

In 2005, young racers were sighted on Green Island for the first time, proving that the new population had bred successfully. Population studies of lizards (i.e. racer prey) on Green Island suggests that it could hold a similar density of racers as on Great Bird Island – i.e. at least 10/ha, equivalent to a population of around 430 racers. The current population size is unknown and it could be several years until numbers have increased sufficiently to allow for reliable estimates, through mark-recapture studies, to be made.

A set back: In 2006, rats reappeared on Green Island, the first time since the eradication in 2002 that they had been recorded. It is likely that they arrived as stowaways on recreational

vessels. A second eradication is therefore scheduled for June 2006, coupled with the establishment of additional permanent bait stations around the island and an education campaign among local boat owners highlighting the need to keep their boats and the islands rat-free.

REFERENCES

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