New Study on Red-Bellied Racer Populations on St. Eustatius

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In 2018 and 2019, RAVON/CNSI interns conducted a study on St. Eustatius to better understand the red-bellied racer population. Threatened by habitat loss, invasive species and hurricane damage, little is known about this snake, which now only inhabits less than 11% of its historical range. This study will help shape the conservation efforts for this species going forward.

The red-bellied racer (*Alsophis rufiventris*) is a snake species that is only found on Saba and St. Eustatius. This species plays an important role in both islands' ecosystems as it preys on small lizards and frogs, regulating their populations. Previously, the red-bellied racer population was thought to be stable over the last decade, despite the threat of invasive species such as black rats (*Rattus rattus*) and Javan mongooses (*Herpestes javanicus*). However, in September 2017 hurricanes Irma and Maria caused substantial damage to the natural ecosystems of Saba and St. Eustatius. This drastic change in the environment caused concern for many native species, including the racer. Therefore, students from RAVON in the Netherlands, working with the Caribbean Netherlands Science Institute (CNSI), sought to determine whether the population on St. Eustatius was still stable or whether it had declined, and if so, to what extent.

Red-bellied racer

The red-bellied racer is the only commonly found snake species on Saba and St. Eustatius. The species belongs in the genus Alsophis and it is among other species closely related to the Antiguan racer (*Alsophis antiguae*). Not much is known about the species, which makes it interesting to study. It is now only found on Saba and St. Eustatius, which is just 10.9% of its original range. Previously the racer also inhabited St. Kitts and Nevis, however around 100 years ago it was extirpated from both islands. The cause was presumably cats that had been introduced by humans, although other sources claim invasive mongooses were the culprit.

Threats

The red-bellied racer faces many threats, including humans, but the primary threat is from non-native or invasive species. For example, cats, chickens, dogs, mongooses and rats prey on this snake. In addition, goats and cattle cause widespread habitat destruction, further threatening this species. Fortunately, mongooses have not yet been able to establish a population on Saba or St. Eustatius. Dr. Jennifer Daltry of Fauna & Flora International and Dr. Robert Powell predicted that the racer population would remain stable unless mongooses reach Saba and St. Eustatius. They stated this in their 2016 IUCN assessment, causing the racer species to be reclassified as vulnerable instead of endangered. However, they did not account for hurricanes in their prediction.

The hurricanes

In September 2017, category 5 hurricanes Irma and Maria caused extensive damage to the islands' forest ecosystems. Alsophis species can be threatened by the effects of hurricanes through reduced prey abundance and racer mortality in general. Additionally, rat populations decline but quickly recover immediately following a hurricane. Habitat alteration and the effects of storms also increase the vulnerability of Alsophis species to hurricanes. Mongooses, which can take refuge inside shipment containers during hurricanes, have a greater chance of reaching Saba or St. Eustatius thanks to regular shipment traffic from St. Maarten, which has a thriving population of mongooses.

Alsophis Statia , photo by: © Brent Kaboord

This study

To understand the stability and size of the red-bellied racer population, RAVON/CNSI interns Kevin Verdel and Brent Kaboord each conducted a population assessment in 2018 and 2019. They focused on racer populations in the Quill and Boven National Parks on St. Eustatius, conducting close to 3000 transect surveys using distance sampling methodology. Data analysis is ongoing and the post-hurricane data will be compared with pre-hurricane data collected by researchers from the University of Puerto Rico to form a complete picture. Nevertheless, we suspect that there is a significant decline in the racer population as a result of these hurricanes. A third student will continue surveys in 2020 and the results of this work will be presented to local stakeholders such as STENAPA to determine an appropriate conservation strategy for the species.

What now?

If hurricane impacts are truly detrimental for the racer population, this could be cause for concern. For the time being, annual monitoring will help determine the size of the population and whether successful reproduction is occurring. Conservation efforts could focus on invasive species management to protect the racer from further decline. For example, strict border controls could be enacted to prevent mongooses from entering Saba and St. Eustatius. Intensive rodent, goat and feral cat control within the racers' range are also recommended. Once these threats are reduced, the racer population might be able to better cope with hurricane impacts, which are predicted to increase in intensity as a result of human-induced climate change.

Alsophis Statia , photo by: © Adam Mitchell

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