

Hurricane Impacts on Bridled Quail-doves in St. Eustatius

By Hannah Madden

On September 6, 2017, Hurricane Irma, a category 5 hurricane, pummeled the northern Lesser Antilles. While St. Eustatius was spared extensive damage to infrastructure and power was restored to most homes within just a few days, forest cover in the Quill National Park did not fare quite so well. Immediately after the storm, defoliation of the vegetation was clearly visible across the dormant volcano, which rises to a maximum height of 600 meters and suffered the brunt of hurricane force winds of up to 150 mph.

Initial exploration of the Quill on September 9 revealed a shocking sight from the crater rim viewpoint at 400 meters. Areas that were once covered in lush evergreen vegetation were barely recognizable. Gone were the majestic Silk Cotton trees that once dominated the canopy; instead we were confronted with an almost bare crater wall covered in once-towering trees that looked like they had been snapped by an invisible giant. Two weeks later, Hurricane Maria passed to the south of St. Eustatius and brought over 100mm of rain but less severe winds. This rainfall helped stimulate vegetation regrowth in the Quill. However much of the

original canopy was severely damaged, and any fruits, seeds or flowers that normally provided food for wildlife were lost.

There was immediate concern for the plight of the Bridled Quail-dove, a species that forages for fruits and seeds on the forest floor. The Quill is the only habitat on Statia that supports quail-doves. Population assessments were conducted in May 2017 in conjunction with a rodent control project that is being facilitated through the Caribbean Netherlands Science Institute (CNSI). Initial results indicated an estimated number of 1,030 quail-doves (standard error [SE] = 275, 95% confidence interval [CI] = 561-1,621) which were found across its local habitat of 440 hectares. This is possibly the highest known density of quail-doves in the region. Thanks to funds provided by BirdsCaribbean's fundraising appeal, surveys were completed in November 2017 to assess quail-dove populations post-hurricane.

Work was lead by Dr. Frank Rivera-Milan (US Fish & Wildlife Service), Hannah Madden (CNSI) and Kevin Verdel (student from the University of Utrecht). A total of 56 x 100m transect surveys

were conducted, and repeated them 2-4 times. This was less than the original 70 x 100m transects conducted in May 2017 due to decreased accessibility of trails. Playback of the Key West Quail Dove's call was used in an attempt to elicit a response from any Bridled Quail-Doves in the survey area. Unfortunately the quail-doves did not respond to the playback, and therefore all detections during November 2017 surveys were by sight only. The perpendicular distance of the quail-dove from the transect was measured, and the data collected were analyzed to estimate the total population size.

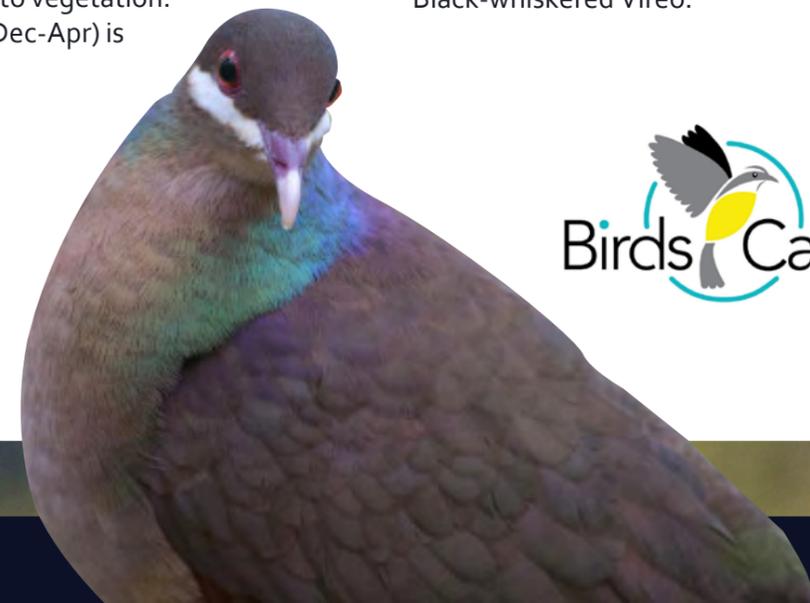
The November 2017 surveys indicated that there had been a decrease in the Bridled Quail-Dove mean population size estimate of around 230 individuals (May 2017 = 1,030; November 2017 = 803; SE = 208, 95% CI = 451-1,229). This corresponds to a population drop of around 22% (SE = 8.2%). Statistical tests indicate that this decrease in the population is not statistically significant (Z score = 0.66, P value = 0.51). Which is good news. The bad news is that there is little food available due to the hurricane damage to vegetation. Since the dry season (Dec-Apr) is

about to commence, already scarce food resources can be expected to be further depleted. These factors will no doubt effect both quail-dove survival and reproductive rates in 2017-2018. The quail-doves, which were observed during the November 2017 surveys looked lethargic and did not flush far or fast during surveys. There is therefore a real risk that the population will decline further due to lack of food. Surveys will be repeated in May 2018, during peak breeding season.

Dry forest vegetation on the outer slopes of the Quill has recovered quickly, however inside the crater approximately 50% of the evergreen seasonal forest that once covered this area has severely impacted and it is estimated that this may take decades before it fully recovers. We expect this will also have a negative effect on the quail-dove and other bird species which rely on this unique habitat for their survival and reproduction. Instead of the usual flocks of Scaly-naped Pigeons (which are now foraging for food in coastal areas), we are now seeing smaller species like Bananaquit, Lesser Antillean Bullfinch, and the migratory Black-whiskered Vireo.



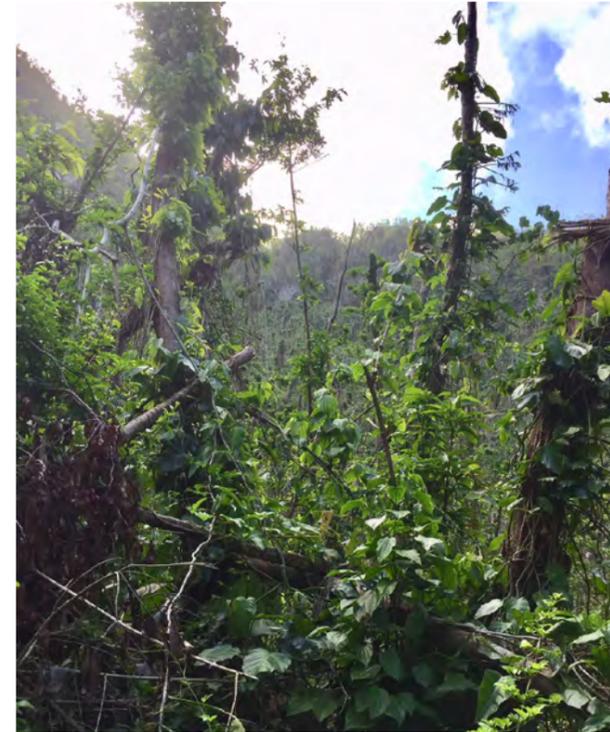
Photos by: © Hannah Madden



Recommendations to help recovery of the bridled quail-dove include removing predators and domestic animals above 250m to help the species recover and enhance its prospects for long-term survival. Rat control is important as rats, together with other invasive predator species, can be expected to increase in density and become more clumped following hurricane-induced changes in foraging resources. Columbidae life-history is typically characterized by low annual survival rate and high annual reproductive rate, and Quail-doves are ground-dwellers that nest near ground level (e.g., on top of bromeliads and other similar substrates providing nest support, relying on their camouflage). Any increase in rat density would threaten Quail-dove survival and reproduction. CNSI's rat control project has great relevance for the Bridled Quail-dove and could produce important conservation results. Baiting will begin in the Quill from January 2018 and the results will be made available later in the year.



Canopy loss in crater.
Photos by: © Hannah Madden



Broken vegetation in crater.
Photos by: © Hannah Madden

Irma provided us with a unique opportunity to study the impacts of hurricanes on avian fauna on St. Eustatius (and elsewhere in the region). It is a bittersweet privilege to be able to contribute our results to the scientific community. Unfortunately, the frequency and intensity of Caribbean hurricanes are predicted to increase under human-induced global warming. It is therefore imperative to protect and enhance the integrity of our natural areas to help our birds and other wildlife survive the next hurricane strike.

Grateful thanks to BirdsCaribbean for funding Dr. Frank Rivera-Milan (US Fish & Wildlife Service), travel expenses, to St. Eustatius National Parks enabling surveys of the Quill National Park, and to CNSI for facilitating this project.

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