

SEABIRD MONITORING IN AN IMPORTANT BIRD AREA OF PUERTO RICO

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Abstract

The White-tailed Tropicbird (*Phaeton lepturus*) is a seabird species distributed along tropical oceans around the world, including the Caribbean region. The population in Puerto Rico has been estimated in less than 300 pairs. In this study we evaluated for the first time the size of the only subpopulation found in the mainland, in the Guajataca cliffs in the north of the island. In 51 biweekly surveys conducted from 2018 to 2020 we found approximately 47 breeding pairs. We did not find significant differences in the abundance of individuals between 2018 and 2019, which started in December and extended until July.

Keywords: abundance, seabirds, population trends, White-tailed Tropicbird

Resumen

El Chirre Coliblanco (*Phaeton lepturus*) es una especie de ave marina distribuida en océanos tropicales alrededor del mundo, incluyendo la región Caribe. En Puerto Rico, esta población se estima en menos de 300 parejas. En este estudio, evaluamos por primera vez el tamaño de la única subpoblación encontrada en Puerto Rico, específicamente en los acantilados de Guajataca en el norte de la Isla. En los 51 censos realizados bisemanalmente durante 2018 a 2020, encontramos aproximadamente 47 parejas reproductoras. No encontramos diferencias

significativas en la abundancia de individuos entre 2018 y 2019, la cual comienza en diciembre y se extiende hasta julio.

Palabras claves: abundancia, aves marinas, tendencias poblacionales, Chirre Coliblanco

Introduction

Seabird populations have drastically decreased over the past century mainly due to mortality caused by pollution, entanglement with fishing gear, and prey scarcity due to overfishing (Paleczny et al., 2015). Also, seabird eggs and chicks are particularly prone to predation by introduced predator species, like rats and feral cats (Leal et al., 2016). These vulnerabilities make pelagic seabirds one of the most threatened groups of birds (Croxall et al., 2012). Paleczny et al. (2015) used a global database from 1950 to 2010 that showed that 2,177 seabird populations have been declining. From these, 812 populations were already endangered.

One of the declining seabird species is the White-tailed Tropicbird (*Phaethon lepturus*). Its population on the western North Atlantic decreased from 10,000 breeding pairs in 1984 to approximately 4,546-5,276 in 1998 (Lee & Walsh-McGehee, 2000). In Puerto Rico the population has been estimated in only 200 to 300 pairs (Lee & Walsh-McGehee, 2000). Breeding colonies are restricted to the offshore islands of Vieques and Culebra, and on the mainland between Isabela and Quebradillas (Van Halewyn & Norton, 1984). A study in Culebra showed that the main factor for the nesting failure of tropicbirds is egg depredation by Black Rats (*Rattus rattus*) (Shaffner et al., 1991).

In this study we evaluated the population status of the White-tailed Tropicbird in the breeding colony of Quebradillas, Puerto Rico from 2018 to 2020. The specific objectives were to determine: (1) the population size, (2) the extension of the breeding season, (3) if the population increased at the end of each breeding season due to the recruitment of juveniles, and (4) if the population size changed among years.

Method

Study area

The Guajataca cliffs (18°29'26.5"N 66°57'02.9"W) are part of an unprotected coastline in northwestern Puerto Rico that covers 4,147 ha from Aguadilla to Camuy. The area includes caves, sand dunes, beaches, and rocky cliffs rising from 5 to 80 m above the sea that are used by seabirds to nest. It has been declared an Important Bird Area by BirdLife International for its rich biodiversity (Anadón et al., 2009).

Seabird surveys

White-tailed Tropicbirds were monitored from a vantage point in the cliff that provided a view of 3 km of coastline in the municipality of Quebradillas (Fig.1).



FIGURE 1: STUDY AREA IN QUEBRADILLAS, PUERTO RICO

Tropicbirds were sampled in biweekly stationary counts from February 2018 to February 2020. Each count was conducted from 0700 to 0905. Observers stood in specific focal points along the cliff and recorded all individuals seen or heard in seven 5-minute counts, separated by 20 minutes. Surveys were only conducted on days with fair weather.

Individuals were classified according to age (adults vs juveniles) based on their plumage and bill characteristics. Adults could be identified by their yellow bills, the

presence of tail streamers, and white body feathers. In comparison, juveniles have yellow-green bills, lack tail streamers, and the body feathers are grayish (Raffaele et al., 2003). All the count data were entered into the eBird project website (eBird, 2020).

Results

The White-tailed Tropicbird population in Quebradillas was surveyed through 51 censuses conducted in two breeding seasons (2018-2019 and 2019-2020). The number of individuals ranged from 0 to 94 (mean = 40 individuals/count) (Fig.2).

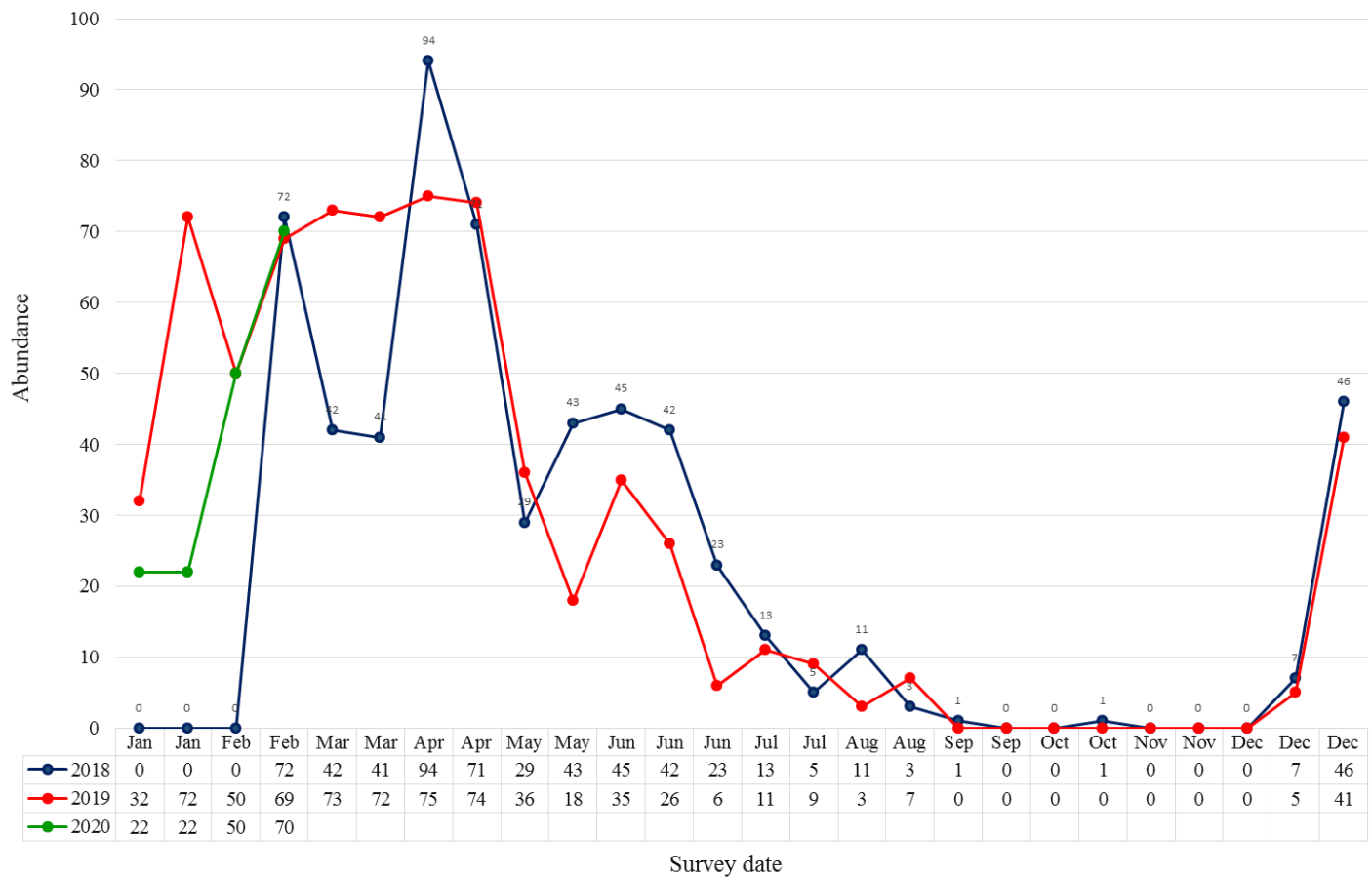


FIGURE 2: COMPARISON OF WHITE-TAILED TROPICBIRD COUNTS FROM FEBRUARY 2018 TO FEBRUARY 2020

Individuals were only found near the cliff during the breeding season, from December to July. No individuals were observed closed to land the rest of the year.

Each year, tropicbirds started arriving to the nesting area in mid-December, with their numbers increasing until February. The mean number of individuals flying in front of the cliff almost halved from February to March with the initiation of the nesting activities (e.g., egg laying and incubation). More individuals were recorded again in May, by the end of the fledgling period, but this time juveniles were observed flying along with adults. Ten juveniles were recorded in the breeding season of 2018 and seven in 2019. The total number of individuals gradually declined toward July when they went offshore.

The highest number of tropicbirds in our surveys ($n = 94$ individuals) was reported on April 7 of 2018 after a helicopter flew close by and flushed birds nesting in the crevices of the cliff. This number suggests that the study area could sustain up to 47 breeding pairs.

Although there were slight differences in the results per month each year, a two-sample T-test demonstrated that there were no significant differences in the mean number of individuals between the two breeding seasons ($p = 0.58$).

Discussion

This work presents the first survey of the mainland population of the White-tailed Tropicbird in Puerto Rico. Our results suggest that this population could be larger than Culebra, the principal population known for Puerto Rico. While almost 50 tropicbird pairs may be breeding in our study site, from 29 to 38 pairs were found nesting in two colonies in Culebra National Wildlife Refuge from 1983 to 1988 (Schaffner 1991). Another study reported that the Culebra population declined to fewer than three pairs by 1987 (Gochfield et al., 1994). The extension of the breeding season, from December to late July, was the same for both populations (Schaffner, 1991).

It is possible that the number of tropicbirds in the northwestern coast of Puerto Rico is larger than what is reported in this work, since the cliffs extend beyond our study area, and, thus, may be providing additional nesting sites. For instance, inventories conducted by volunteers of the Quebradillas Ecological League found individuals nesting in Puerto Hermida, a nearby location in Isabela (E. Estremera, unpubl. data). We recommend that future surveys cover a larger extension of the cliff in order to obtain a more accurate population estimate.

Although we were not able to assess the breeding biology directly due to lack of access to the cliffs, the reproductive success was confirmed by the presence of juveniles. We believe that more juveniles were produced each year than the number reported here, since they are not easily observed when they leave their nests and rapidly leave the nesting area (Buckley & Buckley, 1970).

The evaluation of data from two breeding seasons showed a stable White-tailed Tropicbirds population in Quebradillas. However, a long-term effort is needed to monitor potential fluctuations through time. Also, it is very important that the Guajataca cliffs are protected from development and tourism activities to ensure the sustainability of this restricted-range species.

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