Manu-□ O-Kū (G*ygis alba*) Nest Failure Per Annum - Wind, Precipitation, or Predation?

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Introduction

Manu-O-Ku, or white tern, is a small seabird that breeds throughout the tropical and subtropical regions, exclusively in the Pacific. Incubation lasts for over a month and occurs in shifts between the parents. These birds do not create nests but rely on depressions, cups or three-contact-point 'tripods' on the branches to cradle their speckled eggs. Due to this lack of security, the eggs are more susceptible to high wind, rain, and mammalian and insect predation.

KCC campus chick blown out of nest during mid-February gale

Methods

We observe these birds at various locations throughout the KCC Campus, using binoculars and the naked eye. To locate these birds we look for tracks such as 'white wash', which is the white colored fecal matter these birds drop. After using the white wash to narrow down the area of search, we then look in the trees above the 'white wash' to identify the White terns.The information that has been observed includes but is not limited to the following: possible nesting sites and pairs, number of individuals that appear in sites, what individuals are doing during observation periods. We located active nests on campus and recorded adult activity near nest site. For each nest we recorded the nest fate and calculated nest failure rate for the 2018-19 breeding season and compared to previous years data.

Results

Nest failure rate has increased from last year by 20% but has not surpassed the failure rates from 2016 and 2017. This year we had 6 failed nests out of 15. Currently the nest failure rate is 8% higher than the average of the last 5 years.

Nest Heatmap, Timelines and Breeding Phases

Objective

Our primary objective is to protect white tern nests and monitor nest success rate on campus. Secondary objective is to collect and append current data to historical data, establish and compare current trends with historical trends. Our tertiary objective is to identify factor(s) which may correlate quantitatively with a trend of increasing nest failure on campus.

Makeshift egg carton 'nest' for a chick after an August gale

Discussion

Continuing nest research and evaluation will help us to better understand the nest failure rates and possible causes for an increase. Most of our nest failures coincided with wind storm events. Due to these coincidences we have considered the possibility of a negative impact on nest success rates by climate change. Although, more historical data would be helpful on better determining a historical average nest success rate and whether or not it has been decreasing over the past 10 years. Future research on nest success/failure rate and the correlation with weather events and predator density is required.

Authors, Mentor, References and Acknowledgments

James Lee, Nolan Black, Giovanni Herrera II of Kapi‘olani Community College; Faculty Mentor Dr. Wendy Kuntz;
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