

Grenadines Seabird Project: Nesting Productivity Report

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GRENADINES SEABIRD PROJECT: NESTING PRODUCTIVITY REPORT

Summary

This report illustrates the results of seabird nesting productivity surveys. We surveyed during 16 May 2014 to 25 July 2014 on four islands in the Grenada Grenadines. Six species were recorded nesting including, Red-Footed Booby (*Sula sula sula*), Brown Booby (*Sula leucogaster leucogaster*), Red-Billed Tropicbird (*Phaethon aethereus mesonauta*), Laughing Gull (*Leucophaeus atricilla*), Bridled Tern (*Onychoprion anaethetus melanopters*), and Brown Noddy (*Anous stolidus*). A major population decline was observed compared to the most recent surveys. Of nests followed, 27% produced chicks which reached fledging age.

Background

Previous research done on Caribbean seabirds has shown decreasing trends in populations. Human poaching, invasive species, inadequate food supply, and habitat destruction and disturbance have all been identified as major threats faced by seabird colonies (Haynes 1987). Studies predict the extinction of seabird colonies within 40 years if these issues are not addressed (Lopez-Darias, et al. 2011).

Since seabirds were afforded protection under the “Birds and Other Wildlife Protection Act” (26th January 1957), harvesting levels have progressively lessened with irregular activity occurring within St. Vincent, Grenada, and the Grenadines (Lowrie et al. 2012). Furthermore, Grenada is residence to at least one globally important colony of seabirds. With insufficient enforcement of this act, colonies remain at risk.

Seabird research in the Lesser Antilles is necessary and often overlooked when considering conservation of biodiversity in islands. EPIC (Environmental Protection in the Caribbean), contributes to environmental protection, while focusing on the Lesser Antilles, through research and community-based action. Grenadines Seabird Projects such as this one, titled Assessing Annual Nest Productivity and Survivorship, aim to address the issue of seabird harvest in the Grenadines.

Historically, seabirds have been exploited for their eggs, feathers, and meat (Lyver 2000). Until the governments with jurisdiction over the Grenadines pass legislation and enforcement specifically protecting seabird colonies, community-based stewardship is a promising alternative.

Project Objectives:

1. To assess the annual nest productivity and survivorship of seabirds in the southern Grenadines for selected islands: Frigate, Les Tantes, Diamond, Sisters.
2. To perform a seabird (incubating and roosting) census throughout selected islands of known breeding activity using point counts.

Methodologies

Site Description:

Six sites were visited within Grenada's Grenadines islands (Fig. 1). From these, five sites were monitored, as seen in table 1. Both Frigate and Sandy were excluded from the data set, due to lack of nest activity and late visitation respectively.



Figure 1. Sites visited for Grenadine Seabird Project surveys during expected nesting season 16th May 2014 to 25th July 2014.

Les Tantes 'north' [12°19'12.67"N, 61°33'14.85"W] and Les Tantes 'east' [12°18'55.66"N, 61°33'14.85"W]: Les Tantes 'north' is characterized by sandy shores on the leeward face, with an igneous-rocky interior and slightly elevated grass plain on its windward face. Its northern side is cliff and boulder deposits where eggs were found. It is uninhabited and frequently visited by fishermen, with camps seen on the southern coast. Les Tantes 'east' is characterized by a mountainous interior and cliffy coast with cobbled shores in the southwest. Eggs and nests were found within crevices on the southwestern peninsula and in tree tops throughout the western coast. This island is uninhabited with no refuse or camps to indicate frequent visitation by people.

Diamond Rock [12°19'34.84"N, 61°34'56.46"W]: Its interior is mountainous with thick vegetation. Shores on its leeward face are cobbled, and cliffy boulder structures cover its

windward face where eggs and nests were found. This island is uninhabited but visited by fishermen.

Frigate [12°24'51.83"N, 61°28'46.65"W]: Its leeward face has a sandy shore while cliffy boulder structures dominate its windward face. Interior slightly elevates proceeding eastward with loose vegetation throughout. A plateau where seabirds could typically nest was seen at the northern end; however, no activity was seen this year. Frigate is uninhabited, but dilapidated structures indicate previous inhabitation. A simple tent made with bamboo and tarp was seen on the southeastern shore.

Sandy [12°13'16.66"N, 61°35'10.91"W]: Its leeward face has long sandy shores. Boulder structures on its windward face harbored nests. Its interior is slightly hilly with a combination of grass plains and dense tree growth. It is uninhabited, but dilapidated structures indicate previous inhabitation.

The Sisters [12°18'0.03"N, 61°36'36.21"W]: It consists of three islets connected by shallow reef structures. Its coast had a cliffy boulder structure with dense tree growth seen southward. Northward on the island was a plateau with shrub growth where nests were found. It is currently uninhabited but visited by fishermen.

Grenadines Seabird Nest Productivity Survey

Fishing boats were used to access islands of known breeding sites. We were accompanied by a guide, resident of Rhonde Island, for the first and second trips to gather local knowledge of nesting locations and activity. Visual surveys were done weekly on selected Grenada Grenadine islands, during the expected breeding season of 16th May to 25th July 2014. We marked accessible nests that could be found throughout the island. On subsequent visits, I evaluated the status of previously marked eggs. A final search was then conducted until confident that all accessible nests had been found. See Table 1 one for survey dates.

Invasive Predator Surveys

Evidence of predators was also recorded. Data was collected using baited indicators (chew blocks and tracking tunnels) and local ecological knowledge of fishermen who visit the islands. Procedures for this method were adopted from “Invasive Predator Surveys of Important Bird Areas and Protected Areas in the Grenadines” (Collier 2014). Indicators were left out for approximately one week and assessed upon return. See Table 1 for survey effort and dates.

Grenadines Seabird Census

A visual census, using binoculars and spotting scopes, was carried out at all sites visited on 18th July 2014. Conditions were generally cloudy/ overcast and surveying began at 09:00 h. Counts were done from fishing boats while in transit approximately 30 meters offshore. Approximately ten minutes were spent circling islands completely. Flush counts were also made during weekly seabird nest productivity surveys. We chose a suitable vantage point for maximum view of colonies and possible flyovers during counts.

.	16-May	23-May	30-May	6-Jun	13-Jun	21-Jun	27-Jun	6-Jul	12-Jul	18-Jul	25-Jul
Les Tantes 'east'	1	1*	1	1	1	1	1	1	1	1	1
Les Tantes 'north'	1	1	1	1*	1	1	1	1	1	1	1
The Sisters	0	1	1	1	1*	1	1	1	1	1	1
Diamond Rock	1	1	1	1	1	1	1*	1	1	1	1
Frigate Island	0	0	0	0	0	1	0	0	0	0	0
Sandy Island	0	0	0	0	0	0	0	0	0	1*	1

Table1. Recorded days of surveys done for each island. 1 = visited, 0 = not visited.

All baited indicators were left out for approximately one hundred and sixty eight hours (one week). () = baited*

Results

Breeding Success

See Table 2 for a summary of nesting productivity results. Sixty eggs were monitored throughout the nesting season starting 16 May 2014 to 25 July 2014. From these we observed 18 successful hatches of which 16 survived to fledging for the studied species. Of sites visited, Laughing Gull eggs were most frequently encountered with 15 eggs observed altogether.

On Les Tantes 'east', 100% (n=5) of monitored Bridled Tern eggs were recorded missing before expected hatch by 12st July 2014. On Les Tantes 'north', approximately 67% (n=5) of Bridled Tern eggs were recorded missing before expected hatch by 12th July 2014. A similar scenario occurred with monitored Brown Noddy eggs, where on Les Tantes 'east' 100% (n=4) of eggs were recorded missing before expected hatch by 12th July 2014. A single Red-Billed Tropicbird adult pair was observed on Les Tantes 'east' with young on 13 June 2014. On 12 July 2014, another adult was seen within a rocky crevice about six meters from the nesting pair observed on Les Tantes 'east', but was not present on subsequent visits. Observed lays for Red-footed Booby eggs occurred during the final weeks of the survey period, beginning on 12th July 2014.

Diamond showed signs of early nesting activity for Brown Booby. Chicks were seen for this species on our first visit. Laughing Gull eggs and then chicks were observed on subsequent visits but with low abundance. A Brown Noddy egg was recorded with an adult pair on 12th July 2014. This egg was recorded missing before hatch on the next visit, following stormy weather.

Laughing Gull colonies seemed to thrive well on The Sisters. We observed a relatively high survival rate of 73% (n= 11 chicks) compared to other sites. A single chick was found dead on 12th July 2014 following stormy weather.

Frigate showed no significant sign of nesting activity and no eggs or chicks were recorded. The first visit was during April, when early signs of breeding activity would manifest. The second was during the expected peak of the nesting season on 21 June 2014. Conspicuous signs of nesting activity (nest material, white wash, egg shells) were absent. There were flyovers made by Laughing Gulls and Bridled Terns.

There was visual evidence of roosting and possible nesting activity of terns and boobies on Saline Island [12°25'44.97"N, 61°28'19.18"W] north of Frigate. However, no nests were confirmed for this site.

	No. of eggs laid	No. of eggs hatched	No. of chicks fledged	Survivorship
Les Tantes 'east'				
Red-Footed Booby	3	1	0	0%
Red-Billed Tropicbird	1	1	1	100%
Bridled Terns	5	0	0	0%
Brown Noddy	4	0	0	0%
Les Tantes 'north'				
Brown Noddy	3	0	0	0%
Bridled Terns	7	2	0	0%
Diamond Rock				
Laughing Gull	4	0	2	50%
Brown Noddy	1	0	0	0%
Brown Booby	3	2	2	67%
The Sisters				
Brown Noddy	3	1	0	0%
Bridled Terns	2	0	0	0%
Brown Booby	1	0	0	0%
Laughing Gull	15	12	11	73%
No. of Species observed	6			
No. of nests observed	47			
No. of eggs observed	60			
No. of eggs successfully hatched	19			
No. of chicks successfully fledged	16			

Table2. Summary of Grenadine seabird nesting productivity from 16th May 2014 to 25th July 2014.

Sandy was visited during the last two survey weeks (Table 1). Although it was not initially planned, Rhonde Island fishermen indicated that eggs were collected from a Sandy Laughing Gull colony during the season. Seven nests and seven chicks were seen on the island, with two eggs being incubated on 18th July 2014. A subsequent visit on 25th July 2014 showed a similar

result with two eggs seen, and chicks heard within thick vegetation. This data was not included due to late visitation and inaccuracy of Laughing Gull chick counts within thick vegetation.

Audubon's Shearwater (*Puffinus lherminieri*) and Sooty Terns (*Onychoprion fuscatus*) were not observed during this study. Detection of Audubon's Shearwater was limited by their nocturnal and subterranean habits.

Invasive Predator Surveys

Chew blocks and tracking tunnels showed no evidence of invasive predators on islands surveyed. Baits were already eaten by ants or compromised due to rainy/ stormy weather while set. The presence of goat on Diamond was confirmed through scat observations.

Frequent visitors to the islands indicated sightings of rats on Diamond and The Sisters. One fisherman described rats seen on The Sisters as being old, near hairless with an approximate snout to tail length of ten inches. Goats were not seen during surveys, but seen by fishermen on previous visits to Diamond.

Population Census

The census result table below is a reflection of individual adults recorded during point counts on 18th July 2014.

.	Diamond	Frigate	Le Rock	Les Tantes	Sandy
Bridled Terns	32	0	6	21	30
Brown Booby	60	0	2	0	0
Brown Noddy	26	0	10	32	0
Laughing Gull	14	4	84	6	102
Red-Billed Tropicbird	0	0	0	15	0
Red-Footed Booby	0	0	0	352	0
Sooty Tern	0	0	0	0	0

Table3. Grenadine seabird point count on 18th July 2014 showing number of individuals.

Other Notes

The following consists of field notes and information gathered by informants during the survey period 16 May 2014 to 25 July 2014. Informants, in this case, were seven individuals; three residents of Rhonde Island and four residents or Sauteurs. All were fishermen who were either

present in the Grenada Grenadines weekly or know people who are in the Grenada Grenadines weekly.

Game Utilization

Bird eggs and meat are among the some of the resources gathered by hunters. Iguana (*Iguana sp*), goat (*Capra aegagrus hircus*), and opossum (order *Didelphimorphia*) are also collected. Informants stated that approximately four seabird eggs were collected from Sandy during the 2014 nest period. When visited, a pile of plucked Laughing Gull feathers were found within a dilapidated structure. One Rhonde Island resident reported population declines of game historically taken from the islands. These include Laughing Gulls on Les Tantes and Diamond while goats had declined on Diamond and Rhonde Island. Populations of opossum are believed to be plentiful on Rhonde Island.

Informants were concerned about the number of nesting seabirds this season. One stated that these islands normally would be white-washed with flocks of laughing gulls and eggs would be in abundance. Elders readily equate the productivity of their fisheries catch to low numbers of birds seen this period.

Reptiles: Iguana (*Iguana sp*), Tree Lizards (*Anole sp*), Tree Boa (*Corralus sp*), Ground Lizard (*Ameiva sp*)

Sightings of reptiles were noted throughout the study period on all islands. Informants stated that Ground Lizard and Iguana adults prey on eggs of ground nesting seabird species. Iguanas were frequently seen on Les Tantes 'east', Sisters, and Frigate. Tree Boa is believed to do the same and was reported by fishermen to be present on Les Tantes. Detection of Tree Boa was difficult due to their nocturnal and arboreal nature.

Vegetation:

Accessibility of observable active nests was limited by dense vegetative growth. A Rhonde Island resident believed that overgrowth interferes with available nesting space for seabirds. This was seen where thick vegetation occupied a known breeding area for Laughing Gulls on Diamond. Another informant believed that goat populations kept vegetation in check. He then assumed that present overgrown areas are a result of decreased goat populations following the 1960's. Manmade fires have been used curtail rampant growth, making island interiors accessible.

Samples Collected

Sample feathers were collected for toxin analysis. Feathers were found at the base of trees, assumed preened/ molted, and others from dead birds. A laughing gull skin sample was collected on Diamond, 30 May 2014. Cause of death is unknown but was recent since there were no signs of rigor mortis.

Other Bird Species: Oystercatcher (*Haematopus palliatus*), Yellow-Crowned Night Heron (*Nyctanassa violacea*), Scaly-Naped Pigeon (*Patagioenas squamosa*), Carib Grackle (*Quiscalus lugubris*)

An adult pair of Oystercatchers was seen on Les Tantes ‘north’. Their fidelity to the site and alarm calls suggests the possibility of a nest present nearby. Yellow-crowned Night Herons were observed flying over and perched on the windward face of Les Tantes and coastal tree lines of Sandy.

Possible daily migrations of Scaly-naped Pigeons were seen heading to Grenada from the Grenadines. These were encountered during voyages to the Grenadines shortly after 07:00 h. Nests of this species were seen in nesting areas appropriate for seabird species. This was encountered especially at Les Tantes ‘north’ and The Sisters.

Carib Grackle nesting activity was observed on Les Tantes ‘east’ near the edge of the Red-footed Booby nesting colony. Grackles were seen pecking at unknown contents of one Red-footed Booby nest and at another where an egg was documented. Upon approach, an adult booby stooped in causing the Carib Grackle to flee.

Discussion

We recorded a substantial decline in the number of breeding seabirds when compared to surveys conducted in 2009 (Lowrie et. al. 2012). For example, Diamond Rock, which previously had 1,200 nesting pairs of Laughing Gulls, had 1 gull nest this year. On Frigate Island, which was reported to harbor over 100 pairs of nesting terns and noddies, 1,900 pairs of Laughing Gulls, and 50 Red-billed Tropicbirds, this year had no nesting at all. Some seabird species such as Laughing Gulls lack strong site fidelity and will change nesting locations based on factors such as prey availability and habitat disturbance (Florida Fish and Wildlife 2003). While no nearby islands had significant increases to compensate for the loss of breeding birds, it is possible they nested at other locations.

A loss of primary productivity may have been a factor. Orinoco River flows were likely low due to drought in 2014, thereby reducing productivity in the southern Caribbean Sea and resulting in reduced forage and breeding attempts (Rueda 2014; Bidigare et. al. 1993). Comparing results

from other seabird monitoring sites could provide a better understanding of regional breeding phenomenon in 2014.

The impact of predators was not conclusive. While no invasive predators were observed by surveyors or detected by bait stations, informants indicate that the detection methods may not be a reliable indicator of presence or absence.

Given the small sample size of nests observed during this first year of study, it is difficult to draw definitive conclusions about the status of seabirds in the Grenada Grenadines. However, the average seabird fledging success rate of 27% observed during this study coupled with the dramatic decline in overall breeding population are cause for concern.

Future surveys could endeavor to begin 15 April to facilitate an increased sample size and enable in-depth statistical analysis. Additional study in 2015 will provide further insights into the population dynamics of seabird breeding populations in the Grenada Grenadines.

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