Waterbird Conservation for the Americas
Conservación de las Aves Acuáticas para las Américas

FINAL REPORT
WATERBIRDS IN SABA

Red-billed Tropicbird.
(PHOTO: BRENDA AND DUNCAN KIRKBY)

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Figure 1. Location of Saba in the northern Netherlands Antilles.

1. Introduction

The island of Saba (17.38 ° N 63.13 ° W) is part of the northern Netherlands Antilles, located about 23 miles south of Sint Maarten. Saba is a dormant volcano which comprises an area of 13 km² (5 mi²). Its highest elevation is in Mount Scenery at 887 meters (2877 ft) above sea level.

The Island's topographical origins resulted in a coastline dominated by agglomerate cliffs. Several valleys or ravines run down the slopes of the mountain. There are no inland wetlands. The valleys of Bottom and Flat Point are the largest level plateaus in the Island. The vegetation in the interior of the island is scrub, and grassland. Transitioning to secondary rainforest, where tree ferns brake at middle elevations, and elfin woodland at its peak (Stoffers, 1956; Augustinus, 1985). Saba is recognized also for its healthy coral reefs and aquatic fauna, which surrounds most of the island.

The average annual rainfall is about 1,000 mm (40 inch), and falls primarily between August and November. The climate is generally dry with an average temperature of 27°C (81°F). The human population of the island is 1,560 individuals.. The Government is politically autonomous in internal affairs, while the Netherlands is responsible for its international relations, the judicial system, and military defense.

2. Protected Areas and Conservation Systems

Saba established the Marine Park in 1987 to preserve and manage its marine resources. The Marine Park circles the entire island from the high-water mark to a depth of 60 m (200 feet), including the seabed and overlying waters. A zoning plan divides the Marine Park for various recreational and commercial uses. A system of permanent mooring buoys facilitates diving and prevents damage to corals. One of the few self-sustaining marine parks anywhere in the world, the Marine Park raises revenue through visitor fees, souvenir sales, and donations. These revenues are an important contribution to the island's economy.

The Saba National Protected Area is a 43 hectare (ha) pie-shaped tract of land on the north coast of Saba, formerly owned by the Sulphur Mining Company. The area has important biological, geological and historical values. It encompasses all vegetation zones present on Saba, an abandoned sulfur mine, hot springs, and it is an important nesting area for Red-billed tropicbirds and several other species of seabirds. The property was donated by the Sulphur Mining Company to "Friends of Saba Conservation Foundation, Inc.", a US-based non profit corporation that supports conservation projects on Saba. In 1999, the property was officially turned over to the Saba Conservation Foundation. The establishment of the Land Park began in January 1998 with grants from the DOEN Foundation and WWF-Netherlands. A management plan was prepared with support from the Dutch Government. Legislation to formally

designate the area as a national Protected Area will be submitted to the Island Government as soon as the Island Ordinance Nature Conservation has been prepared.

The Elfin Forest is a proposed Reserve of 8.6 ha. It is composed of montane cloud forest, located at the top of Mount Scenery. The area is supposed to be public land, and the Island Government intends to claim its by prescriptive rights. However, this procedure has been delayed because of the protest of certain private landowners. As soon as these problems are resolved the prescriptive rights procedure can take place and the Island Government can obtain official title to the land. Legislation to formally designate the area as a strict nature reserve can then be submitted to the Island Government as soon as the Island Ordinance Nature Conservation has been prepared. The Saba's Government has agreed to delegate management of the reserve to the Saba Conservation Foundation.

3. Waterbirds species occurring within Saba

Saba harbors 26 resident breeding bird species and 36 regular migratory bird species. Thirteen waterbird families such as Anatidae, Podicipedidae, Procellariidae, Hydrobatidae, Phaethontidae, Sulidae, Pelecaniidae, Fregatidae, Ardeidae, Rallidae, Charadriidae, Scolopacidae and Laridae (Table 1) are represented in the island. The only population estimates presented in this report are for seabirds. The eight seabirds represented are: White-tailed Tropicbird (*Phaethon lepturus*), Brown Booby (*Sula leucogaster)*, Bridled Tern (*Onychoprion anaethetus),* Sooty Tern (*Onychoprion fuscatus)* and Brown Noddy (*Anous stolidus) (*Walsh-McGehee, 2000) (Table 1). Saba is a globally important breeding area for Red-billed Tropicbirds (*Phaethon aethereus)* with 750-1,000 breeding pairs and Audubon's Shearwater (*Puffinus lherminieri)* with a 1,000 breeding pairs (Lee, 2000).

4. Distribution and habitat

The habitat includes coastal cliffs, xeric and rocky hills around the entire perimeter of the island. The coastal cliff topography provides suitable pockets of rainforest ravine habitat, found over 100 meters of elevation. The rainforest ravine habitat is interspersed with grass and scrub. These pockets of rainforest vegetation provide habitat for regionally limited species such as hummingbirds, thrashers and bullfinches.

Waterbirds (Table 1) can be found in the coastline, cliffs, and surrounding ocean waters. Cliffs around the entire island provide an ideal breeding area for Tropicbirds and the Audubon's Shearwater. For the researcher, the accessibility to this area is very difficult due to its topography. Bridled terns, Sooty terns, and Brown noddies, use Green Island and Diamond Rock, which are small cays off the north coast, as breeding grounds (Table 1). Roosting boobies roosting on Green Island, have been observed flushing as planes land at the airport (Collier and Brown, pers. obs.).

Another habitat for migratory waterbirds species is the swimming pools in Saba's houses backyards. These are the only fresh water sources in the island for migratory waterbirds such as Anatidae, Podicipedidae and Ardeidae. It is possible that these pools are chosen by birds as the last opportunity to rest on this island. This phenomenon should be evaluated while doing conservation activities for waterbirds on Saba.

5 and 6. Species of special concern and population estimates

A. Audubon's Shearwater *(Puffinus lherminierii)*

The Audubon's Shearwater is the national bird of Saba, locally called "Wedrego". Its population is difficult to estimate accurately due to inconspicuous nesting habits, and inadequate data. The coastal cliff areas constitutes a tremendously important breeding habitat for the shearwater. The peak breeding period on Saba is unknown. The species is considered of Least Concern by The International Union for the Conservation of Nature and Natural Resources (IUCN).

Current population estimate: Lee (2000) has placed the population at 1,000 breeding pairs based on available habitat.

Population tendency: Anecdotal information suggests that the species population could be drastically declining, but it is hard to estimate because there is no data to effectively confirm their numbers. Environmental Protection in the Caribbean (EPIC) has made the following observations on the Audubon's Shearwater:

1. Specimens have been collected from Saba during December and January (Voous, 1955).
2. One shearwater was found incubating an egg near Sulpher Mine in February 2002. No calls were heard during 10 hours of nocturnal observations in February.
3. In April 2004, two hours of nocturnal playback recordings resulted in one response by a shearwater near The Bottom.
4. In May 2004, four hours of nocturnal playback recordings resulted in three responses near The Bottom and 15-20 responses at Sulpher Mine.

Based on the previous observation it is possible there is no peak in breeding season activity, resulting in a protracted nesting period, which would further hinder population estimates. Numbers of flying or calling adults may be used, when steep topography limits, to estimate nest counts. Although these are the only known estimates, there is sufficient evidence to conclude that Saba meets the globally important criteria for Audubon's Shearwater.

B. Red-billed Tropicbird (*Phaethon aethereus)*

Phaethon aethereus is considered Least Concern by the IUCN. They can be found nesting around the entire perimeter of the island in coastal cliffs, xeric, and rocky hills (Collier and Adam, pers. obs). Colonies of *Phaethon aethereus* from a number of sites in the Lesser Antilles are declining or disappearing.

Current population estimate: The population of Red-billed Tropicbirds has been estimated at 750-1,000 breeding pairs (Walsh-McGehee, 2000).

Population tendency: A national tendency can not be provided at this moment due to scarce previous information. A multi-year nest productivity and site/mate fidelity study has recently been completed at a colony near the landfill. EPIC will continue periodic checks on the colony and banded individuals.

7. Locations and descriptions of key sites used by aquatic species

A. Saba Coastline

- Saba Coastline (17^{o} 38.00 N, 63^{o} 13.00 W) includes all areas from 1 km off shore to 400 meters inland around the perimeter of this small island. It includes also the Green Island and the Diamond Rock.
- The estimated area is 2000 ha, which includes Rainforest Ravine which is part of the proposed Saba National Land Park.
- The proposed Saba National Land Park encompasses the coastal area around Sulpher Mine, a key Red-billed Tropicbird nesting site. It also includes the adjacent crevices, which are nesting areas for Audubon's Shearwater.
- The proposed National Land Park extends up the north slope of the island, to the elfin forest near the peak of Mount Scenery.
- The habitat is primarily rocky cliffs, many of them over 100 meters high, interspersed with grass and scrub.

- The land use is limited to grazing by free roaming goats, and quarry work around Fort Bay.
- The only human settlements along the coast are at Fort Bay, where a dock, several buildings, a rock quarry, and a landfill, exist.

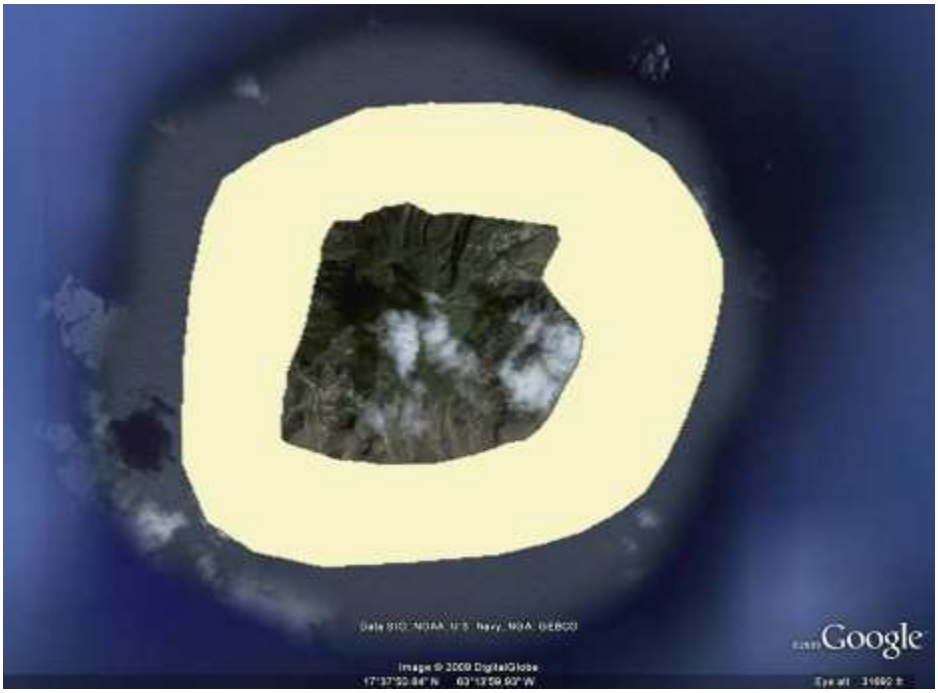

Figure 2. Saba Coastline includes all areas from 1 km off shore to 400 meters inland around the perimeter of this small island. It includes Green Island and Diamond Rock.

8. Issues and threats to waterbirds and their habitats/sites

a. Shearwaters and Tropicbirds are threatened by introduced predators, including dogs, cats, rats, and mice, and trampling of burrows cause by goats. Rat feces were ubiquitous in areas reported to be Shearwater nesting sites, although no nests were found. Feral cats are a serious concern as well. Goats roam unaccompanied, trampling nests, and possibly consuming unattended eggs. However, current eradication efforts are too limited to reduce introduce predator populations.
b. Human disturbance may be of concern, as outdoor tourism activities such as hiking and rock climbing expand.
c. Tropicbirds nest near the entrance to the island garbage burning site as well as a quarry and a harbor/coastal fortification project.
d. Birds in Green Island are disturbed by airplanes landing in the airport.

9. Ongoing aquatic bird conservation programs and participants

a. Non-regulatory programs: A feral cat sterilization program has sterilized at least 200 cats this far, and a government sponsored rodent control program is in effect in localized areas. However, it is not clear if either of these efforts is having a positive effect. Some have argued against the reported dumping of sterilized cats near tropicbird nesting areas. Saba is small enough that complete eradication of some invasive species may be feasible, given sufficient funding, time, and local support.
b. Legislation:
   1) No specific legislation for bird protection exists for Saba

Local environmental protection ordinances include:

- *Exotic Species Ordinance.* Saba prohibits importation of any exotic species without a written permit issued by the Executive Council, and allows authorized officers to remove illegally imported and introduced species, which pose a threat to native flora and fauna.
- *Ordinance on the Identification and Registration of Livestock and Domestic Animals* (passed in 2004). This law requires livestock to be registered and fenced or contained under penalty of fine and confiscation.
- *Nature Protection Ordinance.* The Netherlands Antilles have a draft of Nature Protection Ordinance which must be approved by each island's government. Once it is approved, Saba can create an island.
  specific conservation legislation under that Ordinance.
- *Marine Environmental Ordinance* (1987). The Saba Marine Park was designated under this ordinance, establishing its zoning and regulations.
- *Saba National Marine Park Boating Etiquette*
- *Fisheries Legislation of Saba*

c. Formal and informal international instruments for aquatic bird conservation:

As part of the Netherlands, Saba is party to the following international agreements:

- Convention on Biological Diversity
- Convention on Fishing and Conservation of Living Resources of the High Seas
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar)
- Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES)
- Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (London Convention)
- International Convention for the Regulation of Whaling
- International Tropical Timber Agreement, 1994
- Kyoto Protocol to the United Nations Framework Convention on Climate Change
- Montreal Protocol on Substances That Deplete the Ozone Layer
- Protocol of 1978 relating to the International Convention for the Prevention of Pollution From Ships, 1973 (MARPOL)
- Protocol on Environmental Protection to the Antarctic Treaty
- United Nations Convention on the Law of the Sea (LOS)

d. Funding sources and organizations/programs/individuals relevant to waterbird and/or wetland conservation:

- Ecotourism is a significant part of Saba's economy. Diving in the Marine Park and hiking up Mt. Scenery are among the primary reasons tourists visit the island. The Marine Park is able to generate enough revenue to be self-sustaining through mooring and dive fees. Other income is through donations and government funding and is used to maintain trails, conduct education programs, and establish research initiatives. Despite this, the Saba Conservation Foundation still relies on external funding sources for its day-to-day expenses.
- The Saba Conservation Foundation is a non governmental organization established in 1987, with a mission to preserve and manage Saba's natural and cultural heritage.
- Mrs. Martha "Mandy" Walsh Mc-Gehee – who lived many years in Saba, is very knowledgeable about the avifauna of the island. Her book *A Guide to the Birds of Saba* is in progress.
- DOEN Foundation fund strives to make the world a livable place. To this end, it provides funding to organizations and projects in the fields of Sustainable Development, Welfare and Culture. DOEN

Foundation achieves its objective through the revenues it receives from the Dutch National Postcode Lottery, the Sponsor Lottery and the BankGiro Lottery. http://www.doen.nl/web/show/id=44928

e. Research activities

- The non-profit Island Conservation Effort, headed by Martha Walsh Mc-Gehee, (not longer active in Saba) has recently concluded a multi-year, Red-billed Tropicbird nest productivity, and site/mate fidelity study at a colony near the Fort Bay landfill.
- The non-profit organization EPIC has continued to observe the study area when possible and has also conducted searches for Audubon's Shearwater.
- EPIC and the Society for the Conservation and Study of Caribbean Birds (SCSCB) are collaborating in a Seabird Atlas of the Lesser Antilles. The atlas will be a valuable tool to conserve seabird population.
- Dr. Ethan J. Temeles of Amherst College, Amherst MA has recently studied the Purple-throated Carib (*Eulampis jugularis*) and its heliconia based diet.
- Dr. Powell of AVILA University published a book titled: *Reptiles and Amphibians of the Dutch Caribbean*; Sint Eustatius, Saba and Sint Maarten. Reference: Powell, R., R.W. Henderson, and J.S. Parmerlee, Jr. 2005. Reptiles and Amphibians of the Dutch Caribbean: St. Eustatius, Saba, and St. Maarten. St. Eustatius National Parks Foundation, Gallows Bay, St. Eustatius, Netherlands Antilles.

f. Monitoring and Indicators

There is no direct bird conservation work underway in Saba. EPIC will continue to study the area when possible.

10. Recommendations (made by EPIC)

1. To encourage research on status of resident and migrant waterbirds, in order to determine health of populations.
2. To search for Audubon's Shearwater (*Puffinus lherminieri*). The use of monitoring technology, such as autonomous audio recorders, may provide more consistent and unbiased data than nest searches or the call/playback method

11. Other related information

Saba is part of the Dutch Caribbean Nature Alliance (DCNA). It is a new non-profit organization created to protect the natural environment and to promote sustainable management of natural resources on the six Dutch Caribbean islands (http://www.dcnanature.org/welcome/index.html).

12. References/experts consulted

a. Natalia Collier and Adam Brown, *Environmental Protection In the Caribbean*, EPIC 200 Dr. M.L. King Jr. Blvd., Riviera Beach, FL 33404 USA. ncollier@epicislands.org – Compiled information of Sint Eustatius, IBA accounts for Boven and Quill and provided pictures. (http://epicislands.org/).

b. Mr. Jan den Dulk, *Saba Conservation Foundation* – Reviewed the information and IBA account of Saba Coastline in Saba. Physical address: Saba Conservation Foundation, PO Box 18, The Bottom Saba, Dutch Caribbean, Netherlands Antilles Phone/ Fax: 599-416-3295/ 3435 Email:info@sabapark.com/website:www.sabapark.org

c. Mandy Walsh-McGehee, Island Conservation Effort – Reviewed information and provided information on species numbers and tendencies for species. Address: Gainesville, Florida and Saba, Netherlands Antilles. tropbird@unspoiledqueen.com.

13. Pictures

Figure 1. Typical nesting habitat of Red-billed Tropicbirds on Saba, near landfill by Fort Bay. © EPIC

Figure 2. View of Saba from water. © EPIC

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Table 1. Waterbirds occurrence, distribution, habitat and population estimates in Saba.

Family **Species** **English name**	**Season Resident**	**Migration**	**Habitat**	**Population Estimates** (Individuals)	**Percent of global population**	**Distribution**	**In-country trends** (Status-IUCN)	**References**
ANATIDAE								
Aix sponsa (Wood Duck)	Transient	Boreal	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
Anas americana (American Wigeon)	Transient	Boreal	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
PODICIPEDIDAE								
Tachybaptus dominicus (Least Grebe)	Transient	Boreal	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
PROCELLARIIDAE								
Puffinus lherminieri (Audubon's Shearwater)	Breeding	Intratropical	Coastline	1000 (750-1000 breeding pairs)	12 %	Saba Coastline	Possible declining	Lee (2000); Collier and Brown (2006)
HYDROBATIDAE								
Oceanites oceanicus (Wilson's Storm-petrel)	Non-breeding	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Oceanodroma leucorhoa (Leach's Storm-petrel)	Non-breeding	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
PHAETHONTIDAE								
Phaethon lepturus (White-tailed Tropicbird)	Breeding	Intratropical	Coastline	50-100 pairs	N/A	Saba Coastline (near Bobby Hill)	Uncommon	Lee (2000); Walsh-McGehee (2004); Collier and Brown (2006)

Family **Species** **English name**	**Season Resident**	**Migration**	**Habitat**	**Population Estimates** (Individuals)	**Percent of global population**	**Distribution**	**In-country trends** (Status-IUCN)	**References**
Phaeton aethereus (Red-billed Tropicbird)	Breeding	Intratropical	Coastline	750 -1000 pairs	6 %	Saba Coastline (near the landfill)	Common	Walsh-McGehee (2000); Lee (2000); Collier and Brown (2006)
SULIDAE								
Sula dactylatra (Masked Booby)	Transient	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Sula leucogaster (Brown Booby)	Non-breeding	Intratropical	Coastline; Islet	30 pairs	N/A	Saba Coastline (in Green Island)	Uncommon	Collier *et al.* (2002)
Sula sula (Red-footed Booby)	Transient	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
PELECANIDAE								
Pelecanus occidentalis (Brown Pelican)	Non-breeding	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Uncommon	Walsh-McGehee (2004)
FREGATIDAE								
Fregata magnificens (Magnificent Frigatebird)	Non-breeding	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Common	Walsh-McGehee (2004)
ARDEIDAE								
Ardea herodias (Great Blue Heron)	Transient	Boreal	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
Butorides virescens (Green Heron)	Possible breeder	N/A	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)

Family **Species** **English name**	**Season Resident**	**Migration**	**Habitat**	**Population Estimates** (Individuals)	**Percent of global population**	**Distribution**	**In-country trends** (Status-IUCN)	**References**
Bubulcus ibis (Cattle Egret)	Breeding	N/A	Pools	Few (<Aa)	N/A	Saba's houses	Common	Walsh-McGehee (2004)
Ardea alba (Great Egret)	Transient	Boreal and Intratropical	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
Egretta thula (Snowy Egret)	Transient	Intratropical	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
Egretta caerulea (Little Blue Heron)	Non-breeding	Intratropical	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
Nyctanassa violacea (Yellow-crowned Night-heron)	Non-breeding	Intratropical	Pools	Few (<Aa)	N/A	Saba's houses	Uncommon	Walsh-McGehee (2004)
RALLIDAE								
Porphyrio martinica (Purple Gallinule)	Transient	Intratropical	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
Galllinula chloropus (Common Moorhen)	Transient	Intratropical	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
CHARADRIIDAE								
Pluvialis squatarola (Black-bellied Plover)	Transient	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
SCOLOPACIDAE								
Actitis macularius (Spotted Sandpiper)	Transient	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Uncommon	Walsh-McGehee (2004)

Family **Species** **English name**	**Season Resident**	**Migration**	**Habitat**	**Population Estimates** (Individuals)	**Percent of global population**	**Distribution**	**In-country trends** (Status-IUCN)	**References**
Tringa solitaria (Solitary Sandpiper)	Transient	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Tringa flavipes (Lesser Yellowlegs)	Transient	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Calidris minutilla (Least Sandpiper)	Transient	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Limnodromus griseus (Short-billed Dowitcher)	Transient	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Gallinago gallinago (Common Snipe)	Transient	Boreal	Pools	Few (<Aa)	N/A	Saba's houses	Accidental	Walsh-McGehee (2004)
LARIDAE								
Larus atricilla (Laughing Gull)	Non-breeding	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Uncommon	Walsh-McGehee (2004)
Larus argentatus (Herring Gull)	Transient	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Anous stolidus (Brown Noddy)	Breeding	Intratropical	Coastline; islet	30 pairs	N/A	Saba Coastline (in Diamond Rock and Green Island)	Uncommon	Walsh-McGehee (2004)
Onychoprion fuscatus (Sooty Tern)	Breeding	Intratropical	Coastline	30 pairs	N/A	Saba Coastline (in Diamond	Uncommon	Walsh-McGehee (2004)

						Rock)		
Family Species English name	**Season Resident**	**Migration**	**Habitat**	**Population Estimates** (Individuals)	**Percent of global population**	**Distribution**	**In-country trends** (Status-IUCN)	**References**
Onychoprion anaethetus (Bridled Tern)	Breeding	Intratropical	Coastline; Islet	30 pairs	N/A	Saba Coastline (in Green Island and Diamond Rock)	Uncommon	Walsh- Walsh-McGehee (2004)
Sterna dougalli (Roseate Tern)	Non-breeding	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Accidental	Walsh-McGehee (2004)
Sterna hirundo (Common Tern)	Non-breeding	Boreal	Coastline	Few (<Aa)	N/A	Saba Coastline	Uncommon	Walsh-McGehee (2004)
Thalasseus maximus (Royal Tern)	Non-breeding	Intratropical	Coastline	Few (<Aa)	N/A	Saba Coastline	Uncommon	Walsh-McGehee (2004)