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Conservation opportunities for tern species at two Ramsar sites on Bonaire, Caribbean Netherlands

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Abstract The island of Bonaire is a nesting location for at least four tern species: a subspecies of the Least Tern (*Sternula antillarum antillarum*), the Common Tern (*Sterna hirundo*), the Royal Tern (*Thalasseus maximus*), and a subspecies of the Sandwich Tern (*Thalasseus sandvicensis eurygnathus*). The island is also a significant nesting site for the Caribbean Least Tern (*Sternula antillarum*) population. Our main objectives were to: a) measure and compare breeding success at five known nesting sites on northern Bonaire, b) document and compare the impact of natural and introduced predators on each site, and c) give management recommendations for increasing breeding success based on our results. Our nest counts from 2014 indicate a significant decline in nest abundance compared to historical observations from the 1950s, matching previous studies and observations from the last two decades. Among the five nesting sites in our study, terns at the two island sites had the largest number of breeding pairs and achieved the greatest success, fledging a maximum of ~0.8 chicks per nest, compared to all other sites which were connected to the shoreline. We recorded rats and cats as predators at the peninsula site and field observations suggested that predation by Laughing Gulls (*Leucophaeus atricilla*) might also be occurring at two sites. Both natural and artificial islands on hypersaline lagoons provide good nesting sites for terns on Bonaire as they are protected from mammalian predators. However, recreational disturbance remains the single most serious and pervasive threat to the future of seabird nesting on Bonaire and requires concerted action. We propose a list of management actions to increase the numbers of nesting terns throughout the sites studied. Increasing protection from predators and human disturbance by making artificial nesting islands will provide the potential for Bonaire, and its sister islands, to become major refuges for southern Caribbean metapopulations of these four tern species.

Keywords Bonaire, breeding success, Caribbean Netherlands, Cayenne Tern, Dutch Caribbean, Least Tern, Ramsar, *Sternula antillarum*, terns, *Thalasseus sandvicensis eurygnathus*

Resumen Oportunidades de conservación para especies de charranes en dos sitios Ramsar de Bonaire, Caribe Neerlandés • La isla de Bonaire es un lugar de nidificación para al menos cuatro especies de charranes: la subespecie *Sternula antillarum antillarum*, *Sterna hirundo*, *Thalasseus maximus* y la subespecie *Thalasseus sandvicensis eurygnathus*. También es un importante lugar de nidificación para la población caribeña de *Sternula antillarum*. Nuestros objetivos principales fueron: a) medir y comparar el éxito reproductivo en cinco sitios de nidificación conocidos en el norte de Bonaire, b) documentar y comparar el impacto de los depredadores naturales e introducidos en cada sitio, y c) dar recomendaciones de manejo para aumentar el éxito reproductivo en base a nuestros resultados. Nuestros conteos de nidos en 2014 indican una disminución significativa de su abundancia en comparación con las observaciones históricas de la década de 1950, lo que coincide con los estudios y observaciones de las últimas dos décadas. Entre los cinco sitios de anidación de nuestro estudio, los dos en las islas albergaron la mayor número de parejas reproductoras y tuvieron el mayor éxito reproductivo, con un máximo de ~0.8 polluelos por nido, en comparación con todos los sitios conectados a la costa. Registramos ratas y gatos como depredadores en el sitio de la península y las observaciones de campo sugirieron que la de-predación por parte de *Leucophaeus atricilla* también podría estar ocurriendo en dos de los sitios. Tanto las islas naturales como las artificiales en las lagunas hipersalinas proporcionan buenos lugares de nidificación para los charranes en Bonaire, ya que están protegidos de los mamíferos depredadores. Sin embargo, los disturbios por actividades recreativas sigue siendo la amenaza más grave y generalizada para el futuro de la nidificación de las aves marinas en Bonaire y requiere una acción de conjunto. Proponemos una lista de acciones de manejo para incrementar el número de charranes que nidifican en los sitios estudiados. El aumento de la protección contra los depredadores y los disturbios humanos mediante la creación de islas artificiales para la nidificación, proporcionará el potencial para que Bonaire, y sus islas hermanas, se conviertan en importantes refugios para las metapoblaciones del sur del Caribe de estas cuatro especies de charranes.

Palabras clave Bonaire, Caribe neerlandés, charranes, éxito reproductivo, Ramsar, *Sternula antillarum*, *Thalasseus sandvicensis eurygnathus*

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Résumé Possibilités de conservation des sternes sur deux sites Ramsar à Bonaire, dans les Antilles néerlandaises • Bonaire est un lieu de nidification pour au moins quatre espèces de sternes : une sous-espèce de la Petite Sterne (*Sternula antillarum antillarum*), la Sterne pierregarin (*Sterna hirundo*), la Sterne royale (*Thalasseus maximus*), et une sous-espèce de la Sterne caugek (*Thalasseus sandvicensis eurygnathus*). Cette île est particulièrement importante pour la reproduction de la population caribéenne de Petite Sterne (*Sternula antillarum*). Les principaux objectifs de nos travaux étaient de : a) mesurer et comparer le succès de la reproduction sur cinq sites de nidification connus au nord de Bonaire ; b) documenter et comparer l'impact des prédateurs naturels et introduits sur chaque site ; et c) formuler des recommandations pour une gestion favorisant l'augmentation du succès de reproduction. Nos comptages de nids de 2014 indiquent un déclin significatif de leur abondance par rapport aux observations des années 1950, comme le constataient les études et observations réalisées au cours des deux dernières décennies. Parmi les cinq sites de nidification de notre étude, les deux sites insulaires accueillaient le plus grand nombre de couples reproducteurs et ont obtenu le meilleur succès de reproduction, avec un maximum de ~0,8 poussin par nid, par rapport à tous les autres sites reliés au littoral. Nous avons noté la présence de rats et de chats comme prédateurs sur la péninsule, et des observations sur le terrain ont laissé supposer que la prédation par la Mouette atricille (*Leucophaeus atricilla*) pourrait également se produire sur deux sites. Les îles naturelles et artificielles des lagunes hypersalées constituent de bons sites de nidification pour les sternes à Bonaire, car elles sont protégées des mammifères prédateurs. Toutefois, les perturbations liées aux activités de loisir constituent la menace la plus répandue et la plus forte pour l'avenir de la nidification des oiseaux marins à Bonaire et nécessitent une action concertée. Nous proposons une liste de mesures de gestion pour favoriser l'augmentation du nombre de sternes nicheuses sur l'ensemble des sites étudiés. En renforçant la protection contre les prédateurs et les perturbations humaines par la création d'îlots de nidification artificiels, Bonaire et ses îles sœurs pourront devenir des refuges majeurs pour les métapopulations de ces quatre espèces de sternes dans le sud de la Caraïbe.

Mots clés Antilles néerlandaises, Bonaire, Petite Sterne, Ramsar, sternes, Sterne caugek, *Sternula antillarum*, succès de reproduction, *Thalasseus sandvicensis eurygnathus*

The island of Bonaire is a nesting location for the following four tern species: a subspecies of the Least Tern (*Sternula antillarum antillarum*; hereafter "Eastern Least Tern"), the Common Tern (*Sterna hirundo*), the Royal Tern (*Thalasseus maximus*), and a subspecies of the Sandwich Tern (*Thalasseus sandvicensis eurygnathus*; hereafter "Cayenne Tern") (Voous 1955, Olsen and Larsson 1995, Debrot *et al.* 2009, Wells and Wells 2017). All four species are currently listed under the category of "Least Concern" in the IUCN Red List, which assesses species risk at a global level (IUCN 2019). However locally, on Bonaire, numbers of nesting pairs of these four species have declined since the 1950s (Voous 1983, Wells and Wells 2006, Debrot *et al.* 2009). At the regional level, the subspecies and populations that breed on Bonaire and other southern Caribbean islands are known to be significant (Schreiber and Lee 2000, Wells and Wells 2006). The Cayenne Tern is Critically Endangered in the West Indies (Schreiber and Lee 2000). The Eastern Least Tern breeds only in the Caribbean region, reaching its southern range limit on Bonaire, Curaçao, Aruba, and nearby Venezuelan islands (Lee and Mackin 2008, Wells and Wells 2017), and previous studies indicate that Bonaire is also a nesting site of significance for this subspecies (Wells and Wells 2006). Caribbean nesting populations of both Common and Royal terns are small and scattered, so nesting colonies on Bonaire and other islands in the southern Caribbean are important for the current breeding ranges of these species, especially as these colonies occupy the southernmost extent of both species' distributions (Olsen and Larsson 1995, Buckley and Buckley 2000, Bradley and Norton 2009, Arnold *et al.* 2020).

Human egg consumption was historically common on Bonaire, but legal protection for birds and eggs was initiated in the former Netherlands Antilles in 1926, updated in 1931, and once again in 1955 to include the Cayenne Tern. By 1960, all tern species breeding in the modern-day Dutch Caribbean were included in the legislation (Debrot *et al.* 2009). Wells and Wells (2006) noted that with increased protection from predators and human disturbances, Bonaire, Aruba, and Curaçao have the potential to become a major source for Caribbean metapopulations of terns. Previous studies of tern nesting sites on Bonaire have been limited to irregular and short visits to nesting colonies and did not always correspond with the peak of nesting activity. These efforts were intended only to record nesting activities and estimate nesting pairs (Voous 1983, Wells and Wells 2006, Debrot *et al.* 2009, A. del Nevo pers. comm.), and never provided coverage of nesting sites for the entire season.

In this study, our main objectives were to: a) measure and compare nesting success at five known nesting sites on northern Bonaire, b) document and compare the impact of natural and introduced predators at each site, and c) recommend management strategies to increase nesting success based on our results. For this, we monitored five nesting locations for the entire 2014 season, collecting data on nesting terns twice per week by entering the colonies, flushing birds, and visually inspecting nests, and by using camera traps to record potential predators. As Laughing Gulls (*Leucophaeus atricilla*) pose a significant predation threat to tern eggs and chicks (Donehower *et al.* 2007, Burger 2020), we took measures to avoid flushing tern colonies at sites where Laughing Gulls were present.

Methods

Area of Study

The island of Bonaire lies between 12°19'N, 68°25'W and 12°01'N, 68°12'W and covers 28,800 ha. Washington-Slaagbai National Park is a terrestrial nature reserve that covers ~6,900 ha on the northern part of the island, an area that is characterized

by limestone terraces and steep hills (De Freitas *et al.* 2005, Wells and Debrot, 2008). There are five hypersaline lagoons inside the nature reserve. Physical and chemical conditions of these lagoons vary considerably depending on precipitation and ocean tides (Buitrago *et al.* 2010). Water level is an important factor for the success of the nesting colonies within these lagoons, due to potential flooding.

Of the 48 tern nesting sites identified on Bonaire by Debrot *et al.* (2009), we selected the islands at Salina Slagbaai and Gotomeer, as well as three other nearby nesting sites, for our study. These sites were chosen because: a) they provided the best opportunity for comparing nesting sites surrounded by water to nearby sites that were easily accessible to non-flying predators, b) their location inside a managed natural area would facilitate any future management actions, and c) they were representative of other nesting sites on the island. Both Salina Slagbaai and Gotomeer are designated as wetlands of international importance under the Ramsar Convention (Ramsar Convention 2019).

Three of the nesting sites were in Salina Slagbaai, a ~75 ha hypersaline lagoon located inside the Washington-Slagbaai National Park. During the early 20th century, evaporation platforms and connecting pathways were built inside this lagoon for the purpose of salt production (Hartog 1978). Approximately 15 pairs of Least Tern nested annually on these platforms during the salt production times; however, when the platforms were abandoned in the early 1960s, the number of breeding pairs rapidly increased to ~100 pairs (G. Thodé pers. comm.). For this study, we designated the three nesting sites in Salina Slagbaai as "A," "B," and "C" (Fig. 1). Site A is an abandoned salt evaporation platform of ~1,200 m^2 that is usually completely surrounded by water and can become partially or completely submerged during heavy rainfall. Site B is another abandoned salt evaporation platform of ~1,200 m^2 but is usually not wholly surrounded by water. However, depending on precipitation, this artificial peninsula sometimes becomes an island and can also become partially or completely submerged. Site C is a ~700-m^2 section of shoreline at the mouth of the lagoon that also varies in size depending on water level.

Gotomeer is a 209-ha hypersaline lagoon located just south of Washington-Slagbaai National Park. We monitored two nesting sites in this lagoon, "D" and "E" (Fig. 1). Site D is a ~500 m^2 triangular natural island with an elevation of 1.5 m in the center and is the only site in this study where vegetation is present. The island is mostly covered with grass on its elevated portion, while sea purslane (*Sesuvium maritimum*) covers the lower areas. Most of the nesting at site D occurs on the leeward side of the island. The most important Cayenne Tern colony on Bonaire is at site D, which, despite not being officially part of any protected area, is most easily accessed from within the national park and thus less prone to human disturbance. Up to the late 1980s, this Cayenne Tern colony consisted of ~800 breeding pairs, and eggs were regularly harvested from the island (G. Thodé pers. obs.). Site E is similar to site C: a 250-m^2 section of shoreline at the mouth of the Gotomeer lagoon that varies in size with changing water levels.

Fig. 1. Location of the five nesting sites in northwest Bonaire. Sites A–C are within Salina Slagbaai; D and E are within Gotomeer ("Salina Goto"). Map credit: Alison Ollivierre.

Data Collection

We visited sites A, B, and C at least twice per week between 23 April and 3 August 2014, and Site E at least twice per week between 23 April and 3 July 2014. Since there were very few or no Laughing Gulls (*Leucophaeus atricilla*) present during the time of the study, we entered the colony on every visit, causing all adult birds to flush, and visually inspected the nests. We are confident that we did not cause any egg loss to predation either directly or indirectly. To avoid potential damage to eggs by exposure, we performed each visit during the early morning, between 0830 and 0930, for a maximum duration of 20 min after the first birds flushed from their nests. We marked each nest with an individually numbered, 5-cm wide round tag, anchored to the ground at exactly 20 cm west from the nest, and recorded the number of eggs and chicks present. We recorded missing eggs—eggs that were recorded at least once but were never seen again before completion of the incubation period (20 days after first sighting)—as "disappeared eggs." We collected any dead chicks we encountered at the nesting sites and visually inspected them for marks of predation or other potential causes of death. To avoid causing more disturbance than was necessary for the purpose of this study, we did not handle live chicks. We estimated the number of hatched eggs at sites A, B, C, and E by adding the number of live and dead chicks observed with the number of eggs that disappeared after the incubation period (21 days). Although Royal Terns have longer incubation periods, this species did not successfully hatch any eggs. We estimated the number of chicks fledged from these sites by subtracting the number of dead chicks found from the number of hatched eggs, assuming that chicks that were not found dead were successfully fledged. We also conducted chick counts at sites A and B when possible. At sites C and E, we did not observe chicks on any of our visits.

We visited site D at least twice per week between 23 April and

3 August 2014. A relatively high number (11–55) of Laughing Gulls were continuously present at site D, sitting very close to incubating tern adults and apparently waiting for a chance to depredate eggs or chicks. Thus, to avoid partially or completely flushing the nesting colony, we approached the island on foot within the water, with only our heads emerged and made observations lying on the ground at a safe distance (35–45 m) using range finder binoculars (Bushnell Fusion 12 × 60, Overland Park, KS, USA). We caused a partial flush of the colony on 6 May while trying to install a camera that resulted in the predation of two tern eggs by Laughing Gulls. We aborted the installation that day and successfully completed it during the next visit. We are confident we did not cause or facilitate further egg losses during the rest of the season. We recorded counts of aggregations (or crèches) of both tern and gull fledged chicks during field visits and from photographs taken at these times. For each species, we estimated the number of fledged chicks at Site D by subtracting the number of dead chicks found on the island after all capable chicks fledged from the number of individuals counted in the aggregations of chicks.

We used camera traps (Reconyx 800 and 900, Holmes, WI, USA) to record visual observations during the nesting season. We installed two cameras each at nesting sites A and D and one camera each at sites B and C; we did not install cameras at Site E due to theft concerns. We installed cameras either directly on the ground or on iron rods ~50 cm above the ground, obtaining both a detailed view of nearby nests and a general view of the colony in the background. We programmed cameras to take a single picture every 2 min, and to take 10 pictures over a 1-min period whenever the motion trigger was activated. The field of view of the cameras covered about 70% of the colony at site A and about 90% at sites B, C, and D. The camera coverage schedule varied by month and by site. Site A had camera coverage for a total of 55 days from May through August, site B had coverage for 11 days in June, site C had coverage for 11 days in May, and site D had coverage for 37 days from May through July.

Results

We present nest-related data from sites A–E in Table 1. Least Terns bred in largest numbers at site A, where they were the only tern species nesting. The largest tern breeding site was site D (n = 204), which was a single-species colony of Cayenne Terns. Sites C and E had few nests (n = 2 and *n* = 7, respectively) and only five Common Terns were recorded throughout the study. Only the two largest sites (A and D) were productive, fledging a maximum of ~0.8 chicks per nest (Table 1).

In total, we collected 65,208 photographs from the camera traps: 23,369 from site A, 27,693 from site B, 7,279 from site C, and 6,867 from site D. Despite these images and our frequent checks, we could not determine the cause of failure or disappearance of 43 Least Tern eggs (25.3 %) and 24 Least Tern chick deaths at site A. We did not observe predation by rats (*Rattus* spp.) or feral cats (*Felis catus*) on > 50,000 pictures taken at the two island sites (A and D); however, we did record both of these

Table 1. Breeding statistics of four tern species and Laughing Gulls monitored at five sites in northwest Bonaire in 2014.

Site	Species	Pairs*	Nests	1st egg	Eggs	Clutch	Failed	Hatched	Dead	Fledged	Cause
A (Island)	*Sternula antillarum antillarum*	110	138	8 May	175	1.77	43 (24.6%)	132 (75.4%)	24	0.78	Unknown
B (Peninsula)	*Sternula antillarum antillarum*	11	11	22 May	18	1.45	9 (50%)	9 (50%)	0	0	Rats, cats
C (Shoreline)	*Sternula antillarum antillarum*	2	2	15 May	2	1.00	2 (100%)	0 (0%)	0	0	Unknown
	Sterna hirundo	1	1	17 May	1	1.00	1 (100%)	0 (0%)	0	0	Unknown
D (Island)	*Thalasseus sandvicensis eurygnathus*	204	204	n/a	224	1.10	n/a	173 (77.2%)	5	0.82	Laughing Gulls
	Leucophaeus atricilla	6	6	24 Apr	n/a	n/a	n/a	n/a	1	1.83	n/a
E (Shoreline)	[*Sternula antillarum antillarum, Thalasseus maximus, Sterna hirundo*]**	7	7	15 May	7	1.00	7 (100%)	0 (0%)	0	0	Laughing Gulls

*Pairs=Estimated number of nesting pairs; Nests=Number of nests monitored; 1st egg=Date first egg observed; Eggs=Total number of eggs; Clutch=Average size of clutch; Failed=Number of eggs disappeared before hatching time and failed eggs; Hatched=Number of eggs hatched; Dead=Number of dead chicks collected; Fledged=Productivity estimate (number of chicks fledged per nest monitored); Cause = Causes of egg and chick losses. **These three species were observed sitting, but species for the nests could not be determined.

predators during the night at site B (an abandoned salt evaporation platform partially connected to the mainland; Table 1). At this site, we obtained pictures of a cat predating a chick for a period of about 20 min on 21 June. We also obtained pictures of at least one rat taking eggs on 23 June. The rat(s) remained in the colony for a period of about 2 hr. We did not record any predation with the camera traps at sites C and D. Finally, we did not record any predation by natural or exotic avian predators, but field observations suggested that Laughing Gulls may have caused tern egg or chick losses at sites C and E (Table 1).

Discussion

The presence and nesting success of breeding terns at two of our selected sites (sites A and D) indicate that, although breeding terns on Bonaire have declined compared to the 1950s (Voous 1955), these colonies are still resilient to threats reported by previous studies (Voous 1983, Wells and Debrot 2008, Debrot *et al.* 2009) and current staff of protected areas (G. Thodé and FS pers. obs.). Therefore, these colonies would benefit from management actions aimed at increasing the number of breeding pairs as well as hatching and fledging success.

Productivity, measured as the estimated number of fledged chicks per nest monitored, was relatively high at the two island sites: 0.78 at site A and 0.82 at site D. These are likely among the highest tern breeding success rates on all of Bonaire, although we note that these were maximum estimates, as chicks not recaptured were assumed to have fledged, and despite twice-weekly colony checks, we may have occasionally missed dead chicks. Conversely, the non-island sites (B, C, and E) had zero nesting success. Although similar in size and habitat compared to A and D, these sites provided easy access for introduced predators, like rats and cats, as well as people. Our results show that both natural and artificial islands on hypersaline lagoons can provide good nesting habitat for terns on Bonaire, and predation of eggs and chicks at sites that are accessible to cats and rats can have devastating effects on nesting success, at least in small colonies such as those at sites B, C, and E.

Our results suggest that the main challenges for restoring tern nesting populations to historical levels are the limited number of safe nesting areas (e.g., areas protected from invasive predators) and the small size of these nesting areas. We did not record any human disturbance at our study sites (except for the observer visits); therefore, we cannot estimate the impact of human disturbance. However, previous studies along the east coast of the island, where the majority of the historical nesting sites are located, found recreational disturbance to be the single, most serious, and pervasive threat to the future of seabird nesting on Bonaire (Debrot *et al.* 2009) and to require management action. Almost two decades after Debrot's data collection, recreational pressure has increased dramatically on Bonaire, with the number of visitors more than doubling and the number of nature tours offered more than quadrupling. The number of residents also increased from 12,000 to 20,000. These changes increase the number of people who wander into nature areas, frequently with their dogs, and have detrimental effects on ground nesting birds. Additionally, the tradition of consuming tern eggs has not completely disappeared on Bonaire (G. Thodé pers. obs.) and the significantly increased nesting aggregation of Laughing Gull on Bonaire (Debrot *et al.* 2009) provide other possible threats to breeding terns. Adult gulls harass tern colonies, kleptoparasitizing terns (Hatch 1970), and have been known to eat tern eggs and chicks, especially when raising their own young (Donehower *et al.* 2007, Burger 2020, A. del Nevo pers. obs.).

We believe these challenges for nesting terns on Bonaire can be significantly mitigated by taking relatively simple management actions inside the Ramsar sites; Salina Slagbaai and Gotomeer. These areas already provide safe nesting grounds in the form of natural and artificial islands, legal protection, and management by an experienced nature management organization. Conditions inside these Ramsar sites are ideal to improve and enlarge existing artificial islands as well as to create new islands on areas where a foundation is already available in the form of abandoned (island-like) evaporation platforms used for salt production. Locating tern nesting grounds inside existing protected areas with active management (e.g., ranger surveillance, controlled access, and exotic species control programs) is also important to avoid other types of threats to these colonies (National Audubon Society 2018). If management strategies include controlling the nesting populations of Laughing Gulls, it would be logistically easier to do so within these Ramsar sites.

In our view, nesting sites A and B provide ideal locations to increase the size of the tern colonies and their nesting success, both of which have a high probability of realization. We propose a two-phase plan for expanding the tern nesting populations inside the Washington-Slagbaai National Park: Phase 1 involves optimizing and enlarging existing nesting sites within the park; Phase 2 entails creating new and larger islands using the abandoned salt production evaporation platforms (and paths), and attracting more individuals and other species of terns with decoys (Kress 1998, Jones and Kress 2011, Kress and Jackson 2015).

Although not a problem during our study, nesting sites A and B have been partially or completely flooded in the past, causing significant losses of eggs and chicks (G. Thodé pers. comm.). To avoid this flooding and to prevent access by predators, we propose removing the land connection to site B and using the material to raise the ground of both sites. These actions alone could improve nesting success significantly, especially for nesting site B, where cats and rats caused breeding failure during our study. If these measures prove successful, the next step would be to create more islands and attract other tern species, such as Royal Tern and Common Tern. In addition to using decoys to attract tern breeding pairs, we recommend using sound (voice calls), as Arnold *et al.* (2011) demonstrated the importance of sound use for attracting some species. Ultimately, we believe these management strategies could turn Slagbaai into a highly productive nesting area for several species of terns.

The island site within Gotomeer (site D) does not appear to need any physical adjustments; however, we suggest attempting to increase nesting success at this site by managing predation by Laughing Gulls and other species that compete for the nesting area—a measure that has increased reproductive success of other tern populations near gull colonies (Jones and Kress 2011, Kress and Jackson 2015).

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Title Page Illustration

Both Cayenne Tern (*Thalasseus sandvicensis eurygnathus*) parents and researchers are more relaxed late in the nesting season, when tern chicks start to show crèche behavior and are large enough not to be predated by Laughing Gulls (*Leucophaeus atricilla*), even when the colony is left unguarded by the adults. This allows for larger amounts of much needed food to be flown in, increasing the chances of higher productivity for the colony. Photo taken by Elisabeth Albers on 23 June 2014 at Site D, Saliña Goto, Bonaire, Caribbean Netherlands.

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