



Unparalleled Migration and Communal Roosting of Northern Rough-winged Swallows (*Stelgidopteryx serripennis*) in the Dominican Republic

Migración y dormideros comunales sin precedentes de la golondrina alirrasposa norteña (*Stelgidopteryx serripennis*) en la República Dominicana

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Resumen

Aunque la Golondrina Alirrasposa Norteña (*Stelgidopteryx serripennis*) suele invernar en México y Centroamérica, observaciones recientes en la República Dominicana destacan a la Cuenca del Caribe como una región de paso potencialmente significativa. Cuantificamos patrones espaciotemporales de esta especie en los humedales costeros de la Península de Samaná a mediados de enero de 2019 y mediados de marzo de 2023. Registramos bandadas máximas de aproximadamente 3,000 individuos en enero de 2019 y 4,000 en marzo de 2023. El evento de enero involucró un gran vuelo hacia el oeste a altitudes de hasta 2,000 m, seguido de un rápido descenso para forrajear sobre humedales de manglares. El evento de marzo de 2023 se caracterizó por congregaciones vespertinas y dormideros comunales. Análisis históricos de eBird revelaron que tan solo estos dos eventos (>7,000 individuos) superaron el total acumulado durante un siglo para esta especie en diez islas del Caribe y el Atlántico Medio. Estas agregaciones excepcionales confirman que República Dominicana puede albergar bandadas transitorias masivas de esta especie, subrayando la importancia regional de los mosaicos de humedales y manglares caribeños para los insectívoros aéreos migratorios.

Palabras claves: Caribe; dormidero comunal; Hirundinidae; La Española; temporada no reproductiva; *Stelgidopteryx serripennis*.

Abstract

Although the Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) typically winters in Mexico and Central America, recent observations in the Dominican Republic highlight the Caribbean Basin as a potentially important migratory stopover region. We quantified the spatiotemporal patterns of this species in the coastal wetlands of the Samaná Peninsula during mid-January 2019 and mid-March 2023. We recorded maximum flock sizes of approximately 3,000 individuals in January 2019, and 4,000 in March 2023. The January event involved a large westward flight at altitudes of up to 2,000 m, followed by a rapid descent to forage over mangrove wetlands. The March 2023 event was characterized by evening aggregations and communal roosting. Historical analysis of eBird records revealed that these two events alone (>7,000 individuals) exceeded the cumulative total reported for this species over a century across ten Caribbean and Mid-Atlantic islands. These exceptional

aggregations confirm that the Dominican Republic may support massive transient flocks of this species, underscoring the regional importance of Caribbean wetland and mangrove mosaics for migratory aerial insectivores.

Keywords: Caribbean; communal roosting; Hispaniola; Hirundinidae; nonbreeding season; *Stelgidopteryx serripennis*.

Introduction

The Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) is broadly distributed from Alaska to Panama and the Caribbean (De Jong, 2020); however, its nonbreeding movements and stopover ecology within the Greater Antilles remain poorly documented. While most of the population overwinters in Mexico and Central America (De Jong, 2020; Billerman et al., 2022), increasing observations from the Caribbean Basin suggest the region may host more significant nonbreeding and transient populations than previously recognized (Hailman, 1962; Bayly et al., 2014).

Recent field observations from Hispaniola indicate unusually large winter and early spring aggregations. Herein, we describe the magnitude, behavior, and timing of two massive aggregations of Northern Rough-winged Swallows in the coastal wetlands of the Samaná Peninsula, Dominican Republic. To contextualize the scale and immediate regional significance of these events, we compare our targeted field counts with historical occurrence records from across the Caribbean.

Methods

Observations were conducted in the northeastern Dominican Republic, adjacent to the northwestern shore of Samaná Bay (Figure 1). The area includes the Yuna River delta, which is characterized by seasonal wetlands, pasturelands, and mangrove forests dominated by *Rhizophora mangle*,

Avicennia germinans, *Laguncularia racemosa*, and *Conocarpus erectus* (Cano et al., 2015). Audiovisual surveys were conducted along a 25-km coastal transect in mid-January 2019 and mid-March 2023, following the Caribbean Waterbird Census Level 2 protocol (Sorenson et al., 2019). Swallows were identified via vocalizations, 10x45 power binoculars, numerous photos, and short videos.

To provide historical context for our observations, we extracted occurrence data for the Northern Rough-winged Swallow from eBird (Sullivan et al., 2009) spanning January 1900 to December 2022 across 10 Caribbean and mid-Atlantic island groups (treating Haiti and the Dominican Republic collectively as Hispaniola).

Results

Mid-January 2019 Migration and Foraging.

On 15 January 2019 at 07:10 h AST, we observed a westward movement of >3000 Northern Rough-winged Swallows 2.2 km west of Sánchez. Prior to their descent for foraging, the birds were observed in flight at estimated altitudes of 1,000 to 2,000 m. Flight elevation was qualitatively approximated using the altostratus cloud deck as a visual reference, given that these formations typically occur at elevations just below 2,000 m (NOAA, 2023). Although this visual approximation precludes exact altitudinal measurement and introduces inherent observational variance, it yields a sufficiently robust

estimate of flight altitude for the purposes of this study.

By 11:23 h, approximately 7.1 km west of Sánchez, >300 swallows rapidly descended to forage over the mangrove-wetland mosaics, exploiting abundant arthropod aeroplankton. Vertical fallout from the migrating flock was apparent, with individuals perching on scattered perennial trees (*Tabebuia* spp., *Bursera simaruba*, *Coccoloba uvifera*) between foraging bouts. During the observation period, winds shifted from the northeast (7.6 km/h) to the south (10.8–13.0 km/h), and temperatures ranged from 19.0°C to 29.0°C.

Mid-March 2023 Staging and Communal Roosting. Between 14 and 17 March 2023, >4,000 Northern Rough-winged Swallows exhibited pre-roosting and communal settlement behavior 3.6 km west of Sánchez. In contrast to the 2019 westward transit, this flock moved west-to-east. On 14 March, between 18:00 h and 18:47 h, swallows flying at high altitudes descended vociferously, forming large aerial spirals before settling into the wetland vegetation. By 19:02 h (shortly after the 18:49 h sunset), all individuals had roosted. Eight Barn Swallows (*Hirundo rustica*) were observed foraging among them, and three Merlins (*Falco columbarius*) were seen preying upon the aggregation.

The evening staging pattern was highly consistent over subsequent days. On 15 March, small flocks began arriving at 18:30 h. By 18:37 h, massive flocks arrived, and all birds had roosted by 19:05 h. On 17 March, roosting behavior terminated; flocks arrived starting at 18:33 h, but rather than settling, they soared at high altitudes and departed the area

entirely by 18:55 h. No swallows were detected during subsequent site visits.

Historical Context. A query of eBird data (1900–2022) for the 10 selected island groups yielded a cumulative historical total of 6,860 individuals, with Cuba accounting for nearly 90% of all historical sightings (Table 1; Figure 2). Remarkably, the >7,000 individuals documented during our two targeted surveys in the Dominican Republic exceeded the cumulative century-long total of Northern Rough-winged Swallows reported across all ten island groups combined.

Discussion

The two massive events documented in Samaná Bay confirm that Hispaniola occasionally hosts extraordinary aggregations of Northern Rough-winged Swallows. The sheer magnitude of these flocks, single events that eclipse a century of cumulative regional eBird records, highlights the immediate regional significance of the Dominican Republic's coastal wetlands for aerial insectivores.

The events demonstrated two distinct behavioral uses of the landscape. The January 2019 event was characterized by high-altitude transit followed by rapid descent to exploit localized prey, indicating the area's utility as a foraging corridor. In contrast, the March 2023 event featured synchronous evening staging and communal roosting, a behavior previously documented in other swallow species consolidating movements at resource-rich stopover sites (Yunick, 1977; Komar, 1997; Gordo, 2006). The presence of both transit foraging and multi-day communal roosting indicates that the Samaná Peninsula provides critical structural and trophic resources

capable of supporting massive transient flocks.

While acknowledging the inherent limitations of citizen-science databases, including variable observer effort and spatial coverage that may bias historical baselines (Sullivan et al., 2009; Fink et al., 2022), the targeted counts recorded in this study transcend potential sampling artifacts. The sheer volume of individuals indicates that while the Greater Antilles are not traditionally viewed as a primary wintering stronghold for this species (De Jong, 2020), localized wetland mosaics on Hispaniola serve as critical nodes during the nonbreeding season.

In conclusion, these descriptive records establish Samaná Bay as a site of major regional importance for aggregating Northern Rough-winged Swallows. Protecting these coastal wetland mosaics is essential for supporting such large transient aggregations. Further localized monitoring and descriptive studies are encouraged to determine the frequency of these massive aggregations and to better understand their immediate regional significance within the Greater Antilles.

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Table 1. Summary statistics for the Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) across 10 distinct Caribbean and Mid-Atlantic landmasses (1900–2022). The Dominican Republic and Haiti treated collectively as Hispaniola. Total detections (N = 6,860) were categorized by island, providing a chronological and quantitative overview of the species’ regional presence. Note: Haiti and the Dominican Republic are treated as distinct geopolitical entities in the tabular entries despite occupying a single island.

Island	Landmass (km ²) *	Total no. of NRWS	Year first reported	Min.	Max.	Avg.	SD	Median	Mode
Cuba	109,820	3,844	1992	1	200	8	18.75	3	1
Dominican Republic	48,320	409	1999	1	100	8	13.66	5	1
Haiti	27,560	87	2012	1	22	7	6.74	5	2
Jamaica	10,831	1,031	1994	1	100	13	18.06	4	1
Bahamas	10,010	115	1978	1	15	4	5.17	1	1
Puerto Rico	8,870	620	2002	1	94	7	14.76	1	1
Guadeloupe	1,780	4	2007	1	1	1	–	–	–
Martinique	1,060	1	2011	1	1	–	–	–	–
Turks & Caicos Islands	948	29	2016	1	20	3	5.73	1	1
U.S. Virgin Islands	346	6	1980	1	2	2	0.58	1.5	1
Cayman Islands	264	714	2012	1	30	3	4.13	2	1

Landmass source: Country Reports (2023).

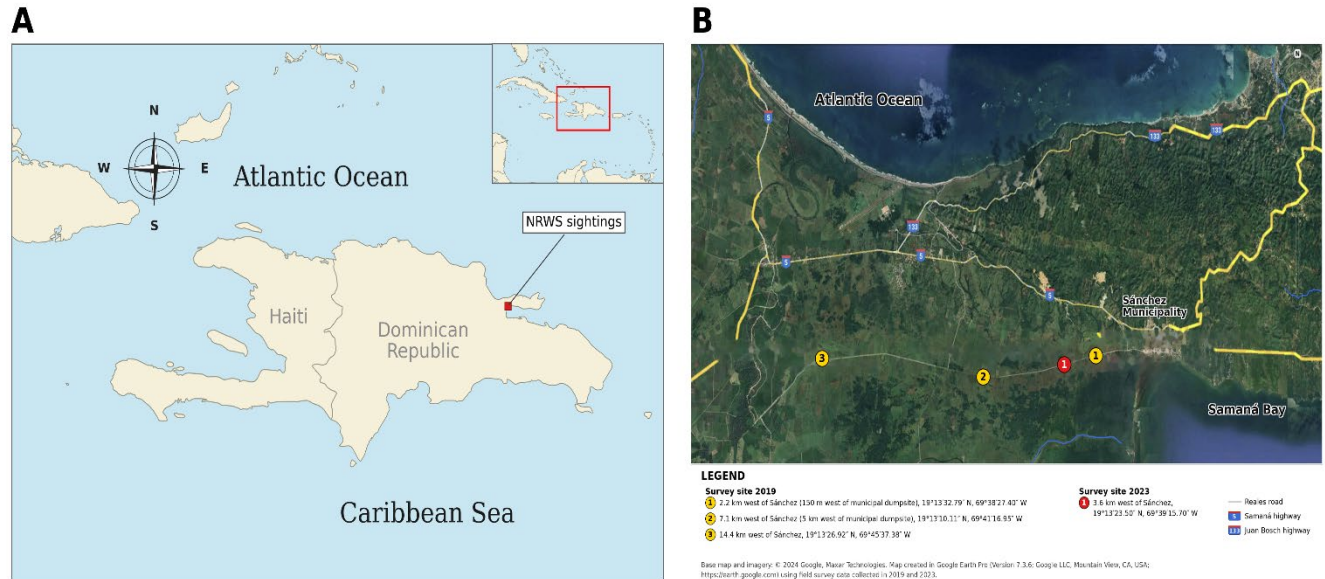


Figure 1. (A) Northern Rough-winged Swallow observation sites west of Sánchez, Samaná Peninsula. Red square indicates the georeferenced sighting location. Map shows Hispaniola (Haiti and the Dominican Republic); inset (upper right) shows Hispaniola's position within the wider Caribbean. (B) Observation sites from targeted surveys in 2019 and 2023. 2019: (1) 2.2 km west of Sánchez (150 m west of municipal dumpsite), 19°13'32.79" N, 69°38'27.40" W; (2) 7.1 km west of Sánchez (5 km west of municipal dumpsite), 19°13'10.11" N, 69°41'16.95" W; (3) 14.4 km west of Sánchez, 19°13'26.92" N, 69°45'37.38" W. 2023: (1) 3.6 km west of Sánchez, 19°13'23.50" N, 69°39'15.70" W. Base map and imagery: © 2024 Google, Maxar Technologies. Map created in Google Earth Pro (Version 7.3.6; Google LLC, Mountain View, CA, USA; <https://earth.google.com>) using field survey data collected in 2019 and 2023.

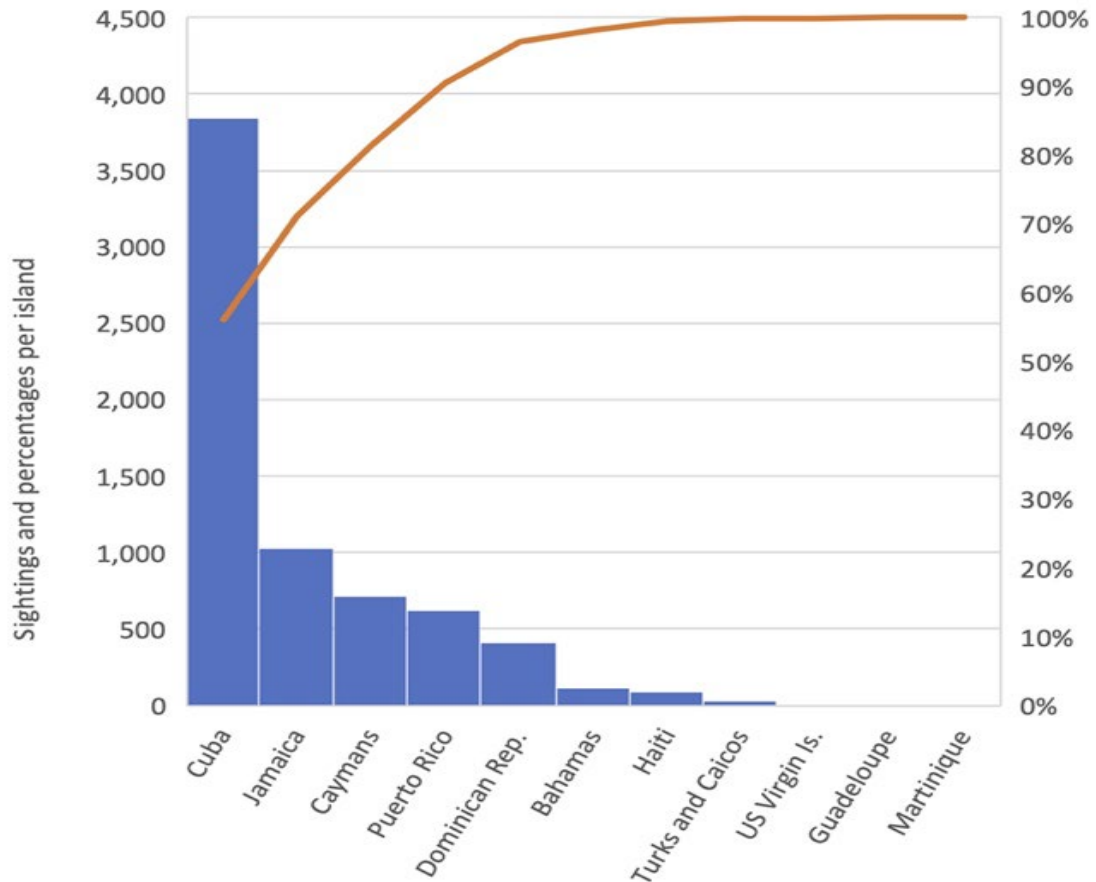


Figure 2. Distribution of Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) sightings across 10 mid-Atlantic and Caribbean landmasses. Data encompass 6,860 individuals recorded between January 1900 and December 2022 (Sullivan et al., 2009), with the Dominican Republic and Haiti treated collectively as Hispaniola. Vertical bars represent the absolute number of sightings per location in descending order (left axis), and the overlaid curve depicts the cumulative percentage of total sightings (right axis). The distribution demonstrates that most detections occurred on a small subset of islands, most notably Cuba and Jamaica.