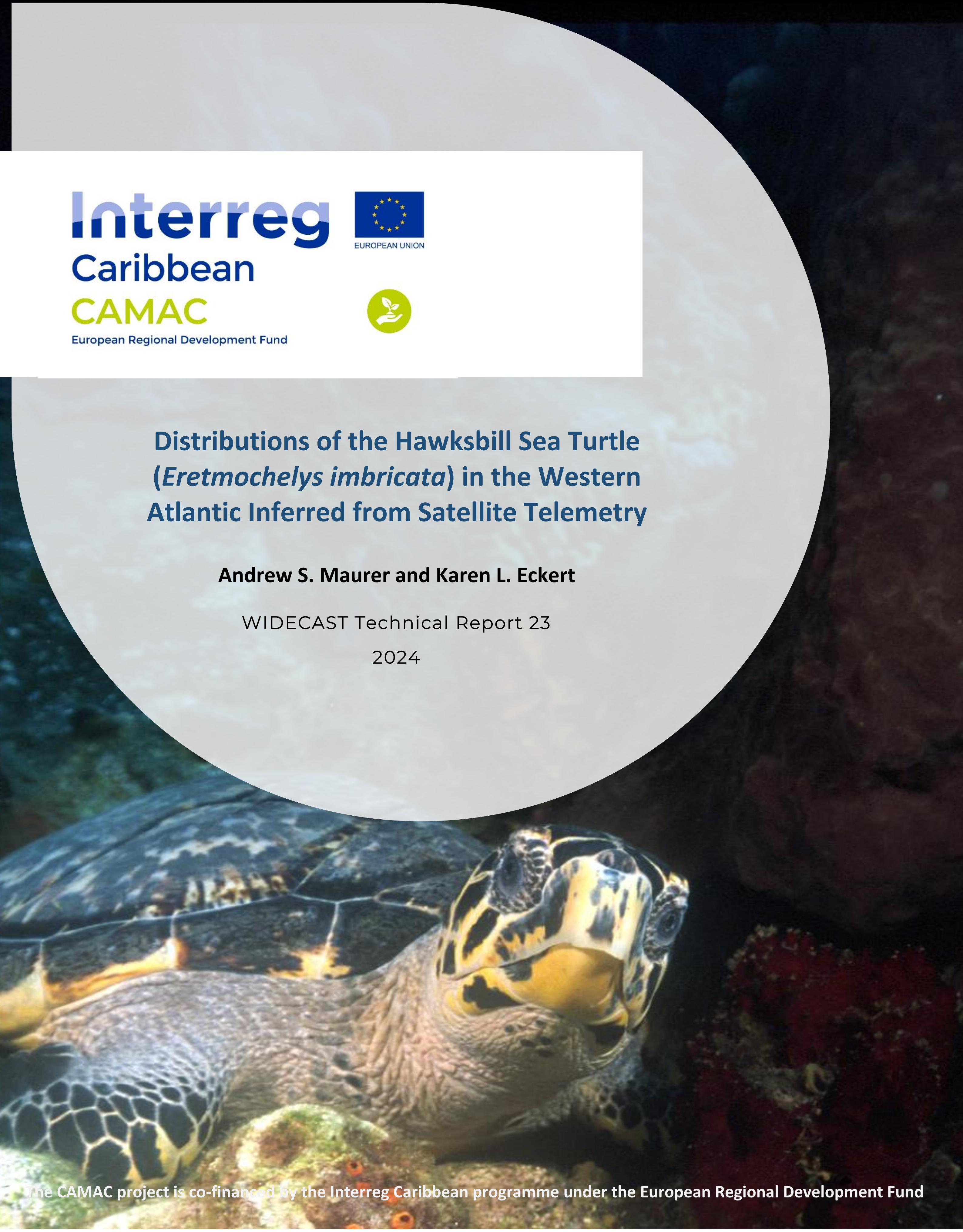

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Distributions of the Hawksbill Sea Turtle (*Eretmochelys imbricata*) in the Western Atlantic Inferred from Satellite Telemetry

Andrew S. Maurer and Karen L. Eckert

WIDECAST Technical Report 23

2024

The CAMAC project is co-financed by the Interreg Caribbean programme under the European Regional Development Fund

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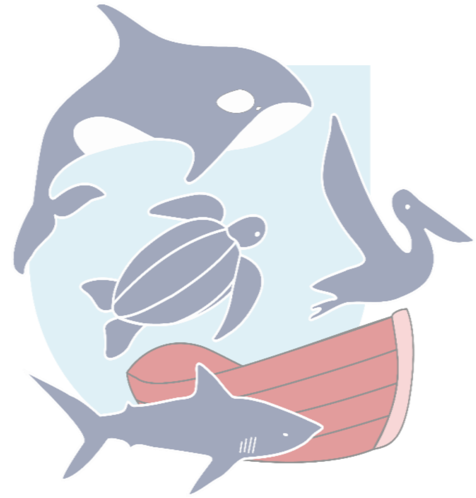

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WIDECAST

This project was generously supported by the UNEP Caribbean Environment Programme's Regional Activity Centre for the Protocol concerning Specially Protected Areas and Wildlife (SPAW RAC) as part of the [Caribbean Marine Megafauna and Anthropogenic Activities (CAMAC)] initiative.

For bibliographic purposes, this document may be cited as:

Maurer, Andrew S. and Karen L. Eckert. 2024. Distributions of the Hawksbill Sea Turtle (*Eretmochelys imbricata*) in the Western Atlantic Inferred from Satellite Telemetry. UNEP Caribbean Environment Programme, Specially Protected Areas and Wildlife Regional Activity Centre (SPAW RAC). WIDECAST Technical Report No. 23. Godfrey, Illinois. 35 pp.

ISSN: 1930-3025

Download: https://www.widecast.org/widecast-publications/

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Credit to Data Contributors

No synthesis at this scale is accomplished alone, and we are deeply grateful to those who contributed their hawksbill sea turtle telemetry data to this collaborative initiative. Data providers are listed below, grouped by country/territory of research site, and further arranged by the number of turtles sampled, starting with the largest datasets.

Brazil: *Rio Grande do Norte Dataset***:** Claudio Bellini, Erik A.P. dos Santos (Centro Nacional de Pesquisa e Conservação de Tartarugas Marinhas e da Biodiversidade Marinha do Leste, Vitória, Espírito Santo, BR); Renata M.A. Ramos (ENGEO – Soluções Integradas em Meio Ambiente, Vitória, Espírito Santo, BR); Armando J.B. Santos (Florida State University, Tallahassee, Florida, US; Fundaçao Pró-TAMAR, Tibau do Sul, Rio Grande do Norte, BR); *Bahia Dataset*: Neca Marcovaldi, Gustavo Stahelin (Fundaçao Pró-TAMAR, Salvador, Bahia, BR). **Mexico:** Eduardo Amir Cuevas Flores (Universidad Autónoma de Baja California, Ensenada, Baja California, MX); Raul de Jesus Gonzalez Diaz Miron (Aquarium del Puerto de Veracruz, Veracruz, MX); Abigail Uribe-Martinez (Universidad Nacional Autónoma de México, Sisal, Yucatán, MX). **St Croix (USVI, USA)**: Kristen Hart (United States Geological Survey, Davie, Florida, US). **Antigua & Barbuda:** Seth Stapleton (Jumby Bay Hawksbill Project, St. John's, AG); Andrew Maurer (National Oceanic and Atmospheric Administration, La Jolla, California, US). **Bonaire (Dutch West Indies):** Kaj Schut, Daan Zeegers (Sea Turtle Conservation Bonaire, Kralendijk, Bonaire, Dutch West Indies). **Cuba:** Félix Moncada-Gavilán (Centro de Investigaciones Pesqueras, La Habana, CU). **Martinique (French West Indies):** Damien Chevallier (Centre National de la Recherche Scientifique, Les Anses d'Arlet, Martinique, French West Indies). **Dominican Republic:** Lucy Hawkes, Brendan Godley, Annette Broderick (University of Exeter, Penryn, Cornwall, UK); Yolanda M. León (Grupo Jaragua, Santo Domingo, DR); Ohiana Revuelta, Jesús Tomás (University of Valencia, Valencia, ES). **Puerto Rico (US):** Robert van Dam (Chelonia Inc, San Juan, Puerto Rico, US); Carlos Diez (Department of Natural and Environmental Resources, San Juan, Puerto Rico, US). **Anguilla (UK):** Louise Soanes, Farah Mukhida (Anguilla National Trust, The Valley, Anguilla, UK); Kafi Gumbs (Department of Fisheries and Marine Resources, The Valley, Anguilla, UK). **Barbados:** Julia Horrocks, Julian Walcott (University of the West Indies, Cave Hill, St. Michael, BB); Gina Belle (Ministry of Environment and National Beautification, Bridgetown, Saint Michael, BB). **Jamaica:** Andrea Donaldson (National Environment and Planning Agency, Kingston, St. Andrew, JM); Rhema Bjorkland (George Mason University, Fairfax, Virginia, US). **Turks and Caicos Islands (UK):** Peter Richardson (Marine Conservation Society, Hereford, Herefordshire, UK). **St Eustatius & St Maarten (Dutch West Indies):** Nicole Esteban (Swansea University, Swansea, UK). **Montserrat (UK):** Jack Wiggins (University of Exeter, Penryn, Cornwall, UK); Alwyn Ponteen (Fisheries and Ocean Governance Unit, Brades, Saint Peter, MS).

Executive Summary

The hawksbill sea turtle (*Eretmochelys imbricata*) is a highly imperiled species, listed as *Critically Endangered* on the IUCN Red List of Threatened Species and *Endangered* under the U.S. Endangered Species Act. Recovery scenarios would be bolstered by management efforts geared toward improving survival in distinct habitats occupied across life history stages. Management would, in particular, benefit from more comprehensive descriptions of movement and migration corridors, as well as of foraging and residency locations, the latter being where hawksbills spend the vast majority of their time, accumulate energy for development and reproduction, and are exposed to various environmental changes and anthropogenic threats.

Herein, we synthesize information from the Wider Caribbean Region south to Brazil, which we refer to as the Western Atlantic (WA), and describe migratory corridors and putative foraging distributions at this regional scale. We evaluate spatial distributions through the lens of satellite telemetry data. Partners from organizations in 16 countries and overseas territories contributed 258 individual satellite tracks, allowing for powerful regionwide inferences. After several steps of data cleaning and filtering, we were left with 252 tracks composed of a mixture of Argos and FastlocGPS locations. We used these raw fixes to fit a state-space model to smooth spatial error and aid in differentiating between migratory and nonmigratory behavioral states, generating a dataset of model-predicted locations with each assigned to one of three states/periods: breeding, migratory, or residency/foraging. We computed centroids from residency/foraging locations, and then used these, and all migratory points, to generate continuous spatial representations of relative regional foraging densities and migratory corridors via kernel smoothing.

Broadly, our results demonstrate that hawksbills concentrate in high-use neritic habitats throughout the Western Atlantic, with several areas of particularly dense residency—notably in the Leeward Islands of the Eastern Caribbean archipelago, the Nicaragua Rise to the northeast of Nicaragua and Honduras, Northwest of the Yucatan Peninsula (Mexico), and adjacent to the easternmost region of Brazil. These high-use areas may be worthy of prioritization by regional habitat managers, especially since they most likely reflect critical foraging grounds. We also document high degrees of migratory connectivity, particularly throughout the Caribbean Basin, with similar but spatially distinct patterns of connectivity off the coast of Brazil. When migratory strategies are deconstructed by sampling site (breeding areas) in the Caribbean Basin, the data describe unique patterns of egress, preferred movement corridors, and destination grounds associated with different sampling sites.

Although we present novel, comprehensive insight into regionwide patterns of hawksbill space use, we suggest that our findings have the greatest potential as a launching point into future analyses. In particular, the integration of spatial information for environmental variables (e.g., habitat type/benthic cover), anthropogenic threats (e.g., fishing effort), and synergy with the movements of other marine megafauna—all are promising avenues for future research that would support the conservation and recovery of this (and other imperiled marine megafauna) species in the WA. Finally, a large number of management entities share jurisdiction over hawksbill habitats in the WA, suggesting that detailed maps of sea turtle distributions at local and regional scales are necessary to guide cross-jurisdictional conservation planning at biological scales.

Resumen

La tortuga carey (*Eretmochelys imbricata*) es una especie muy amenazada, clasificada como “En Peligro Crítico” por la Lista Roja de la UICN y “En Peligro” por la Ley de Especies en Peligro de Estados Unidos. Los programas para restablecer la especie se verían reforzados por los esfuerzos de gestión para mejorar su supervivencia en los diversos hábitats que ocupa en todas las etapas de su historia vital. En particular, las acciones de conservación se beneficiarían de una descripción más completa de los lugares de alimentación y residencia - hábitats donde las tortugas pasan la mayor parte de su tiempo, acumulan energía para el crecimiento y la reproducción, y están expuestas a cambios ambientales y amenazas de origen humano.

En este estudio, sintetizamos los datos disponibles para una región que se extiende desde el Caribe hasta el sur de Brasil, que denominamos Atlántico Occidental, y describimos la distribución de las zonas de alimentación y los corredores migratorios a esta escala regional. Evaluamos las distribuciones espaciales utilizando datos de telemetría por satélite. Socios de organizaciones de 16 países y territorios proporcionaron 258 rastros de satélite individuales. Tras varias etapas de limpieza y filtrado de datos, obtuvimos 252 rastros compuestos por una mezcla de localizaciones Argos y FastlocGPS. Utilizamos estos datos para ajustar un modelo de espacio de estados con el fin de suavizar el error espacial y diferenciar entre estados de comportamiento migratorio y no migratorio, generando un conjunto de datos de localizaciones predichas por el modelo, cada una asignada a uno de los tres estados/períodos siguientes: reproducción, migración, búsqueda de alimento. Utilizamos las localizaciones del modelo para generar representaciones espaciales continuas de las densidades regionales relativas de búsqueda de alimento y de los corredores de migración.

En general, nuestros resultados muestran que las tortugas carey se alimentan en hábitats neríticos en todo el Atlántico occidental, con varias áreas que muestran altas densidades - en particular en las islas de sotavento del archipiélago oriental del Caribe, en la Bahía de Nicaragua en el noreste de Nicaragua y Honduras, en el noroeste de la Península de Yucatán de México, y cerca de la región más oriental de Brasil. Estas zonas altamente frecuentadas deberían ser consideradas prioritarias por los gestores de la región. También documentamos una fuerte conectividad de los corredores migratorios, particularmente a lo largo de la cuenca del Caribe, con patrones de conectividad similares pero espacialmente distintos frente a la costa de Brasil. Cuando las estrategias migratorias se deconstruyen por sitio de muestreo (áreas de reproducción) en el Caribe, los datos describen patrones únicos de salida, corredores de movimiento preferidos, y zonas de destino asociados con diferentes sitios de muestreo.

Aunque este estudio presenta una visión nueva y detallada de los patrones regionales de uso del espacio de las tortugas carey, sugerimos que nuestros resultados serían de aún mayor interés como punto de partida para futuros análisis. En particular, la integración de la información espacial para las variables ambientales (por ejemplo, tipo de hábitat / cobertura bentónica) y las amenazas antropogénicas (por ejemplo, el esfuerzo pesquero) son vías prometedoras para futuras investigaciones en apoyo de la conservación de las tortugas marinas en el Atlántico occidental. Finalmente, un gran número de entidades de gestión comparten jurisdicción sobre los hábitats de las tortugas carey en el Atlántico occidental, lo que sugiere que se necesitan mapas detallados de las distribuciones de las tortugas marinas a escalas local y regional para guiar la planificación de la conservación entre jurisdicciones a escalas biológicas.

Résumé

La tortue imbriquée (*Eretmochelys imbricata*) est une espèce très menacée, répertoriée comme étant en danger critique d'extinction dans la liste rouge de l'UICN et en danger d'extinction par la loi américaine sur les espèces menacées d'extinction. Les programmes visant à rétablir l'espèce seraient renforcées par des efforts de gestion visant à améliorer sa survie dans les différents habitats qu'elle occupe à tous les stades de son histoire de vie. Les actions de conservation bénéficieraient en particulier d'une description plus complète des sites d'alimentation et de résidence - habitats où les tortues imbriquées passent la majeure partie de leur temps, accumulent de l'énergie pour la croissance et la reproduction, et sont exposées à divers changements environnementaux et menaces d'origine anthropique.

Nous synthétisons dans la présente étude les données pour une région allant des Caraïbes au sud du Brésil, que nous appelons l'Atlantique occidental, et décrivons la distribution des zones d'alimentation et des couloirs migratoires à cette échelle. Nous évaluons les distributions spatiales à travers les données de télémétrie par satellite. Des organisations de 16 pays et territoires ont fourni 258 traces satellitaires individuelles. Après plusieurs étapes de nettoyage et de filtrage des données, nous avons obtenu 252 traces composées d'un mélange de localisations Argos et FastlocGPS. Nous avons utilisé ces données pour ajuster un modèle espace-états afin de lisser l'erreur spatiale et de différencier les états comportementaux migratoires et non migratoires, en générant un ensemble de données de localisations prédites par le modèle, chacune étant assignée à l'un des trois états/périodes suivants: reproduction, migration ou recherche de nourriture. Nous avons utilisé ces localisations afin de générer des représentations spatiales des densités régionales de recherche de nourriture et des couloirs migratoires.

De manière générale, nos résultats démontrent que les tortues imbriquées se nourrissent dans des habitats néritiques dans tout l'Atlantique occidental, avec plusieurs zones présentant de fortes densités - notamment dans les îles sous le vent de l'archipel des Caraïbes orientales, dans la baie du Nicaragua au nord-est du Nicaragua et du Honduras, au nord-ouest de la péninsule du Yucatan, au Mexique, et à proximité de la région la plus orientale du Brésil. Nous documentons également une forte connectivité des couloirs de migration, en particulier dans l'ensemble du bassin des Caraïbes, avec des schémas de connectivité similaires mais spatialement distincts au large de la côte du Brésil. Lorsque les stratégies migratoires sont déconstruites par site d'échantillonnage (zones de reproduction) dans les Caraïbes, les données décrivent des modèles uniques de sortie, des couloirs de mouvement préférés, et des terrains de destination associés à différents sites d'échantillonnage.

Bien que cette étude présente un aperçu nouveau et détaillé des schémas régionaux d'utilisation de l'espace par la tortue imbriquée, nous suggérons que nos résultats auraient un intérêt encore plus grand comme point de départ pour de futures analyses. En particulier, l'intégration d'informations spatiales pour les variables environnementales (par exemple, le type d'habitat / la couverture benthique) et les menaces anthropogéniques (par exemple, l'effort de pêche) sont des voies prometteuses pour la recherche future qui soutiendrait la conservation des tortues marines dans l'Atlantique occidental. Enfin, un grand nombre d'entités de gestion partagent la juridiction sur les habitats de tortues imbriquées dans l'Australie occidentale, ce qui suggère que des cartes détaillées de la répartition des tortues marines aux échelles locale et régionale sont nécessaires pour guider la planification de la conservation entre juridictions à l'échelle biologique.

1 Introduction

The hawksbill sea turtle (*Eretmochelys imbricata*) is a highly imperiled species, listed as *Critically Endangered* by the IUCN Red List of Threatened Species and *Endangered* under the U.S. Endangered Species Act. Population trends in the Western Atlantic (WA), which we define as the Wider Caribbean Region and Brazil, were consistent with these designations when last assessed (Meylan 1999, Meylan & Donnelly 1999, Mortimer & Donnelly 2008). Recovery scenarios for the species would be bolstered by management efforts geared toward improving survival in distinct habitats occupied across life history stages. However, in many cases, the location of high-use marine habitats is poorly understood.

Environments occupied by hawksbills throughout ontogeny may be generalized into three categories: (1) pelagic zones, where neonates presumably occur during the 'lost years,' i.e., the first 1–3+ years of life; (2) neritic (here defined as waters overlaying the continental shelf) presumed foraging areas, occupied by juveniles and mature adults; and (3) breeding areas, here defined as nesting beaches and adjacent waters. Of these habitats, individuals spend the most time by far in neritic zones. Pelagic habitats utilized during the first years of life are poorly understood due to the difficulty of studying movement at that stage (Mansfield et al. 2014); as such, these habitats are outside the scope of this report. Nesting areas are relatively well documented in the WA due to the efforts of beach monitoring programs, with the known nesting distribution spanning coastal areas from Florida, USA to southern Brazil, including distributional gaps in the Northern Gulf of Mexico and north-eastern Brazil (Dow Piniak & Eckert 2011, Eckert & Eckert 2019). Thorough documentation of these breeding habitats has enabled protections in many jurisdictions. However, breeding areas are generally only visited by adults for brief (approximately two-month) periods every 2–4+ years (e.g., Kendall et al. 2019).

Outside of pelagic and breeding phases, essentially all other time is spent in foraging areas, and these areas lack comprehensive geographic description because of the resources (financial, human, logistical) needed for associated research projects relative to beach-based work (Hamann et al. 2010, Rees et al. 2016, Wildermann et al. 2018). Foraging habitats are where individuals accumulate the energetic resources needed to fuel somatic growth and reproduction and, further, may expose turtles to a multitude of anthropogenic interactions or threats (e.g., Dunn et al. 2010). Thus, an understanding of spatial foraging distributions should be a core component of local and regional hawksbill conservation. Available information suggests that WA hawksbills generally forage within neritic waters, where they are known to prefer reef habitats due to dietary associations with sponges (Porifera; Meylan 1988). At a coarse (i.e., continental) scale, the species' foraging range largely mirrors the nesting range (Becking et al. 2016, Hart et al. 2019, Cuevas et al. 2022, dos Santos et al. 2022), although information on foraging distributions has not been comprehensively collated at scale. Adults may fixate on a single foraging area once they reach maturity. Indeed, sea turtles typically exhibit long-term fidelity to a foraging home range (Shimada et al. 2020). Especially in the case of hard-shelled species, these home ranges can be quite small and may be static on decadal timescales.

Regional foraging ranges have been documented through various methods. For example, in-water research capturing and re-sighting animals has revealed key information (e.g., Bellini et al. 2019), although such work is logistically difficult and has produced geographically sparse occurrence data. In contrast, a growing body of work has documented foraging habitat use through satellite telemetry (e.g., Marcovaldi et al. 2012, Hart et al. 2019, Uribe-Martínez et al. 2021). In general, adult females are sampled on nesting beaches, when they are most accessible, and tracked on the return journey to foraging areas. This methodology has been productive in describing foraging habitats and, importantly, reveals migratory connectivity and corridors that are highly relevant for regional conservation, including efforts to mitigate anthropogenic impacts (e.g., commercial shipping or fishery interactions). While inferences are typically strongly biased toward adult females, these data usefully inform our understanding of survival and reproductive output, both highly important to population trend (e.g., Piacenza et al. 2016). Moreover, female distributional patterns may reflect the distribution of other population segments, assuming a degree of space use overlap.

Despite broad application and the fundamental utility of resulting location data, results from individual tracking efforts have never been comprehensively summarized for a WA-wide perspective on hawksbill distributions. Such a summary—including characterizing the movement corridors that connect high-use coastal areas (i.e., connect nesting beaches with residency/foraging grounds)—is the primary objective of our synthesis.

2 Rationale

In 2023, the Regional Activity Centre of the Specially Protected Areas and Wildlife Protocol to the Cartagena Convention (SPAW RAC) began a multi-year initiative to build capacity to reduce anthropogenic impacts on marine megafauna within the Wider Caribbean Region. The Caribbean Marine Megafauna and Anthropogenic Activities (CAMAC) project entails a five-year effort, with a core work package focused on assessing the socio-economic and environmental issues related to interactions between marine megafauna and fisheries. Within this package, and in the first year of the CAMAC timeline, SPAW RAC identified a goal of mapping the distribution, concentration areas, and migration corridors of the hawksbill sea turtle in the Wider Caribbean Region.

The geographic focus of the CAMAC initiative is defined as the exclusive economic zones (EEZs) of the Lesser Antilles, plus those of the Dominican Republic, Haiti, and Jamaica to the west, and the Guiana Shield countries and territories to the southeast. However, given the migratory nature of hawksbills and the connectivity that may result between disparate EEZs, this phase of the CAMAC project embraces the expanded scale of the Wider Caribbean, i.e., the geographical area comprising the EEZs of the territories of the Gulf of Mexico, the Caribbean, and the Guianas. Considering the proximity of the Guiana Shield countries to Brazil, we further broadened the working extent of this report to include Brazil, thus approximating the entire Western Atlantic range of the hawksbill sea turtle (cf. Eckert & Eckert 2019).

Herein, as part of the CAMAC project, we present the results of an effort to address the knowledge gap surrounding regionwide hawksbill high-use habitats (putative foraging distributions) and migratory corridors in the WA. We coordinated and led a synthesis of satellite telemetry data, bringing together information from geographically diverse sources (see Credit to Data Contributors, above) to generate inferences at the scale of the WA. Our results advance contemporary understanding of hawksbill habitat use in this region, contributing to the existing knowledge base regarding population boundaries and connections among rookeries and foraging grounds (Hamann et al. 2010). Moreover, our synthesis sets the stage for future work integrating environmental data and information on anthropogenic threats, and producing similar syntheses for other sea turtle species.

3 Methods

3.1 Data compilation

Table 1. Satellite telemetry data contributions. N denotes number of individual turtles. Locations provides the number of total satellite fixes after data filtering.

Site	N	Locations	Period	Associated Citations
Brazil	56	60699	2005-2021	(Marcovaldi et al. 2012, dos Santos et al. 2022)
Mexico	51	20982	1999-2017	(Uribe-Martínez et al. 2021, Cuevas et al. 2022)
Saint Croix	31	43002	2011-2017	(Hart et al. 2019)
Antigua	26	26895	1998-2020	(Maurer 2021, Maurer et al. 2022)
Bonaire	16	11256	2003-2021	(Becking et al. 2016)
Cuba	15	658	1996-2001	(Moncada et al. 2012)
Martinique	13	6343	2013-2017	(Nivière et al. 2018)
Dominican Republic	10	19609	2008-2011	(Hawkes et al. 2012, Revuelta et al. 2015)
Puerto Rico	9	5876	1998-2003	(van Dam et al. 2008)
Anguilla	7	3832	2017-2018	(Soanes et al. 2022)
Barbados	7	1218	1998-2012	(Horrocks et al. 2001)
Jamaica	4	2611	1998-2001	(Maurer et al. 2022)
Turks and Caicos Islands	4	17156	2009-2013	(Stringell et al. 2015)
Montserrat	1	3009	2021-2022	unpublished
St Eustatius	1	338	2006-2007	(Esteban et al. 2015)
St Maarten	1	210	2005-2005	(Esteban et al. 2015)

Beginning in July 2023, we requested data from collaborators known to have conducted satellite telemetry research on hawksbill turtles in the WA. Specifically, we asked for raw location data, including indicators of spatial error, plus complementary biological information on individual turtles tracked (see Appendix A: Data Sharing Agreement). Participants from 16 countries and territories contributed satellite tracks for a total of 258 individual hawksbills, with datasets ranging in sample size from 1 to 56 individuals (Table 1; Figure 1).

Tracking data spanned two decades, with the earliest data collected in 1996. Of the 258 satellite transmitter deployments, 18 featured FastlocGPS technology, providing high accuracy fixes relative to Argos locations collected in the remainder of deployments (Dujon et al. 2014).

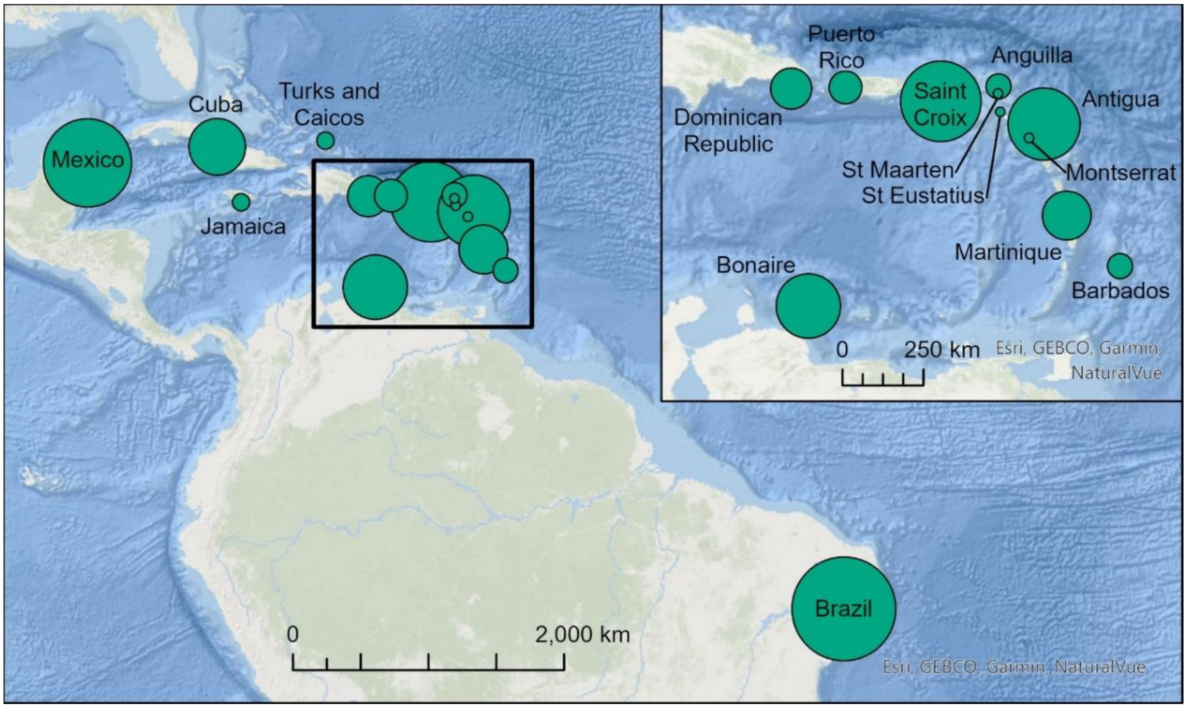

Figure 1. Countries and territories of projects contributing data from throughout the Western Atlantic. The size of green circles is proportional to the sample size contributed (see Table 1).

We imposed several filters to the data, after which the remaining dataset totaled 252 individuals and 233,694 satellite fixes. These included 223 females, 14 males, and 15 adults of unknown sex (due to historical data loss). Individuals ranged in size from 75.0 to 106.5 cm curved carapace length, with a mean ± SD of 89.6 ± 5.6 cm. Six turtles showed evidence of hybridization with loggerhead turtles (*Caretta caretta*), all from Bahia, Brazil (Marcovaldi et al. 2012). The vast majority of turtles in the sample were captured at breeding areas, though rarely turtles were caught at foraging areas by fishers (Stringell et al. 2015). Individual deployments are enumerated in Appendix B.

For filtering, we first excluded three juveniles, as the rest of transmitter deployments tracked adult turtles. For rare instances of turtles tracked over multiple migrations, we included locations during just the first migration to minimize resulting bias to individuals. We removed any duplicate locations (i.e., collected at the same timestamp), keeping a higher accuracy location when possible. Finally, we implemented spatial filters, removing any biologically nonsensical outliers falling excessively inland, eastward toward the Eastern Atlantic, or westward, e.g., in the Pacific Ocean.

3.2 Data analysis

We analyzed satellite telemetry data with three primary aims. We sought to: (1) address spatial error associated with satellite fixes; (2) distinguish between migratory and foraging (i.e., post-migratory residency) behavioral states; and (3) compute continuous spatial representations (i.e., rasters) of migratory and foraging (i.e., post-migratory residency) space use in the region.

Satellite telemetry data, and in particular Argos locations, often entail significant spatial error and thus fixes do not represent the exact "true" movement path of the animal tracked. Estimated accuracy for Argos data has long been represented by a location class corresponding to a radius assumed to contain the true location, and more recently by indicators derived via Kalman filter (i.e., error ellipse information). FastlocGPS fixes can also be affected by error, but are assumed to be roughly an order of magnitude more accurate than the highest accuracy Argos location class (Jonsen et al. 2023). We used the R package "AniMotum" (Jonsen et al. 2023) to implement a state-space model (SSM) to estimate standardized, precise locations from raw, filtered satellite data, in effect down-weighting low accuracy fixes to smooth error-driven noise in movement tracks (see Jonsen et al. 2023 for more details).

A first step in the SSM is to filter data to remove biologically unreasonable outliers based on autocorrelation between successive points, here largely based on implied swimming speeds. We followed accepted conventions for Argos data by setting the maximum swimming speed to a conservatively high velocity of 2.5 m/s (Jonsen et al. 2023). Filtering excluded 13 individuals before modeling; these were particularly error-prone tracks (i.e., poor location classes) of few fixes. We then fit the model in two stages. First, for tracks that consisted of at least one fix per day, we parametrized the model to estimate one location every 24 hours. Standardizing to this frequency across deployments reduced bias to individuals. In the second stage, we modeled those individuals with less than one fix per day. In general, these entailed earlier deployments, before technological improvements to transmitters and during periods when fewer Argos satellites were in orbit. In order to reduce model overfitting (i.e., estimating locations for time periods lacking empirical information), for these tracks we specified the model to estimate one location for every raw fix (i.e., at the raw timestamps). Given proportionally fewer model-fit locations per unit time, these individuals had less influence on subsequent regional inferences. However, because these tracks were generally historical, this also had the beneficial effect of giving weight to more current data.

During SSM fitting, we additionally estimated a "movement persistence" parameter that uses autocorrelation to quantify a behavioral state for each model-estimated location. This persistence parameter falls within a continuous spectrum (ranging 0 to 1) and in effect shows where turtles slowed down (i.e., exhibiting reduced swim speeds and higher turning angles) and persisted for longer periods of time (Jonsen et al. 2023), making it useful for differentiating between migratory and nonmigratory states. We used this parameter in combination with patterns in overall displacement through time to assign model locations

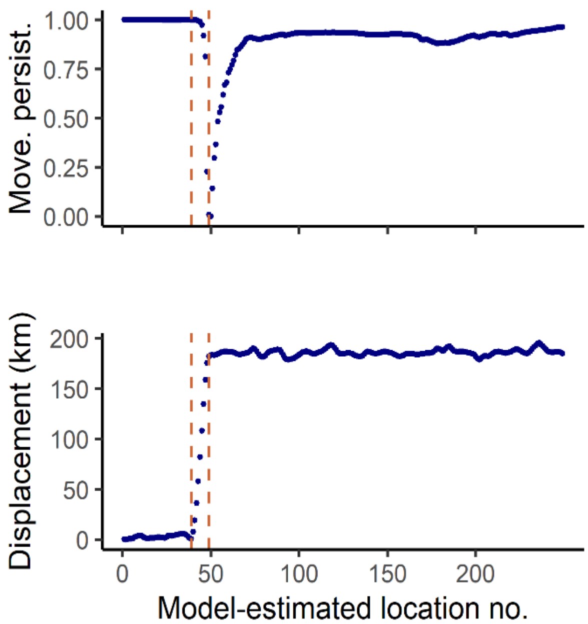

Figure 2. Migratory state delineation based on an estimated movement persistence parameter (top) plus displacement from start of the satellite track (bottom) for a hawksbill sea turtle (*Eretmochelys imbricata*) tracked from Saint Croix, USVI. The migration is bounded by dashed lines.

to one of three periods: reproductive, migratory, or (putative) foraging (Figure 2); we note that the "foraging" period encapsulates post-migratory movements in a distinct residency area, including a suite of additional (non-foraging) turtle behaviors (e.g., resting, switching between microhabitats). Adult hawksbills in general utilize relatively small, discrete areas when not migrating, including a single, fixed foraging area (Hart et al. 2019), simplifying the process of state designation throughout deployments based on those two criteria (i.e., movement persistence and overall displacement; Figure 2).

After all model-estimated locations were assigned a behavioral state, we then used a spatial kernel density estimator to generate isarithmic maps (i.e., continuous raster surfaces) reflecting the density of foraging residency areas and migratory corridors within the WA. We discarded locations associated with reproductive periods, as these correspond with nesting areas that have already been thoroughly described (Eckert & Eckert 2019). In the case of migratory analyses, we used all corresponding model-fit locations. Thus, individuals with slower and longer migrations had a proportionally greater effect on the inferred pattern, which was appropriate for our objectives herein. For putative foraging densities, we first computed a single centroid (i.e., center point of activity) for each turtle's residency area and then derived a continuous density surface from the set of centroids such that individuals had equal weight on the inferred regionwide pattern. This approach omits information on home range area size, but we suggest that this is non-problematic because hawksbill home ranges amount to points in space within the broad working extent.

For rare cases with fewer than five estimated foraging locations for an individual, we computed a centroid as simply the mean latitude and longitude. Alternatively, in the majority of cases with five or more foraging locations, we computed a 50% kernel utilization distribution (UD) with the R package "adehabitatHR" (Calenge 2006), employing the default extent parameter (i.e., estimation grid) and a smoothing parameter selected via the ad hoc method for a bivariate normal kernel; we then derived a centroid from that UD. In four cases we used a larger UD type due to function limitations for the geometry of given sets of foraging points; these entailed three 75% UDs and one 90% UD. Any effects on resulting inferences were negligible. We worked within a Spherical Mercator projected coordinate reference system (EPSG: 3857) for UD computation and subsequent spatial analyses.

Given final sets of migratory points (all model-estimated migratory locations; N=4,900) and foraging points (all centroids; N=206), we generated separate isarithmic maps via kernel density estimation with the R package "spatstat" (Baddeley & Turner 2005). In both cases, we considered the dataset of locations as a point-process pattern reflecting continuous densities in space. We experimented with several kernels to reflect that underlying density (e.g., Epanechnikov and quartic), and chose a gaussian kernel with the smoothing bandwidth selected via likelihood cross validation and then reduced by 90% (Baddeley & Turner 2005). There is not a standard method for evaluating kernel bandwidth selection; rather, we concluded that these parameters were most effective at representing the empirical density pattern. However, parameterization can be easily adjusted in potential future iterations of the analysis. We normalized resulting estimates of relative density to fall between 0–1 for ease of interpretation. To explore variation in migratory corridors we additionally parsed migratory locations by sampling site (Figure 1) to generate site-specific density patterns following the same kernel estimation methods. Brazil separated naturally given geographic isolation, and we explored eight other locations with the next-highest sample sizes (see Table 1).

Below, we present distributional patterns observed via satellite telemetry in multiple forms: model-estimated point and migration track line patterns (i.e., vector), in addition to estimated densities in continuous space (raster). For mapping, we masked computed raster surfaces to an area defined by a 1,000-km buffer of the underlying point pattern to reflect our lack of inference into processes outside this area. We focus primarily on patterns at the level of the regional population, foregoing detailed discussion of localized trends. Information on such finer-scale patterns is presented in previous literature (see Table 1).

4 Results and Discussion

4.1 Distribution of residency areas

Synthesized information on putative foraging densities (i.e., density of non-breeding residency areas) presented in vector and raster formats clearly delineate observed high-use areas for hawksbills in the Western Atlantic (Figure 3). Broadly, our results suggest that the species forages in neritic habitats throughout the WA region. Post-migratory residency areas roughly encircled the Caribbean Basin, extending into the southern Gulf of Mexico (Figure 4) and outside the Wider Caribbean into southern Brazil (Figure 5). The southern limit of the observed foraging range was 17.253°S, while the northern limit was 24.663°N.

Latitudinal limits for the foraging distribution we documented do not represent extremes for the species' WA range, as hawksbills from regional rookeries are known to forage in locations as far north as Bermuda (Bjorndal & Bolten 2010) and Florida, USA (Hart et al. 2012), in addition to as far west as Ascension Island (Weber et al. 2017). However, we note from limited evidence that individuals observed outside the range we observed are generally nearly all immature (Gorham et al. 2014, Avens et al. 2021), which may frame preliminary expectations for stage-specific dispersal patterns in the region. That is, turtles appear to choose to reside in a more restricted range once they reach a certain size or age, although this conjecture would benefit from more geographically comprehensive empirical support. Nesting does occur outside the range suggested by our findings, but only rarely (Lund 1985).

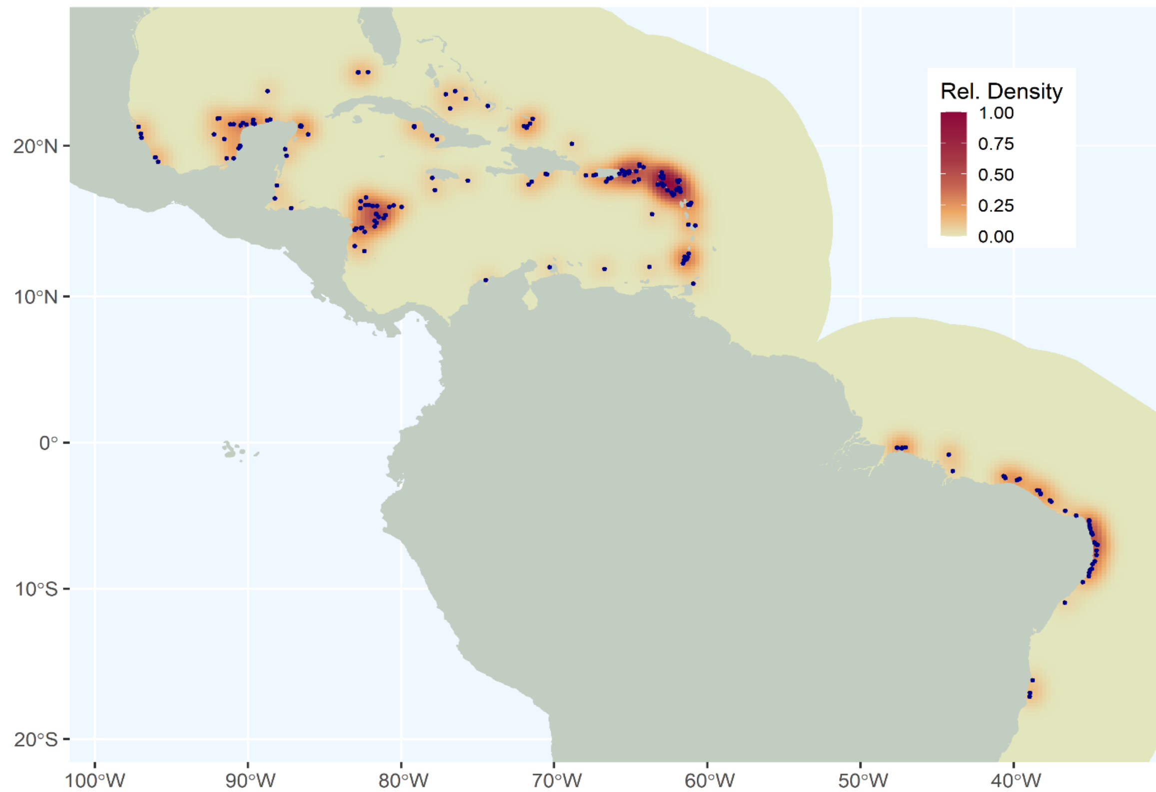

Figure 3. Relative density of residency areas for hawksbill sea turtles (*Eretmochelys imbricata*) in the Western Atlantic as inferred from satellite telemetry. Dark blue points show the locations of centroids for putative foraging areas used to compute densities via kernel smoothing (N=206). Density values have been normalized to a 0–1 scale.

Our findings reveal several areas of with a particularly high density of residency areas, notably in the Leeward Islands of the Eastern Caribbean archipelago (i.e., roughly centered around Anguilla), the Nicaragua Rise to the northeast of Nicaragua and Honduras, Northwest of the Yucatan Peninsula, Mexico, and adjacent to the easternmost region of Brazil. When interpreting these “hotspots” it is important to consider spatial bias to capture sites inherent in the pattern. That is, although hawksbills clearly make long, international migrations in the Wider Caribbean (e.g., Becking et al. 2016, Hart et al. 2019), which helps to add some randomization to the observed pattern in residency sites, shorter migrations are the modal behavior (Maurer et al. 2022). As such, we were most likely to observe residency areas located nearby to sites of transmitter deployment.

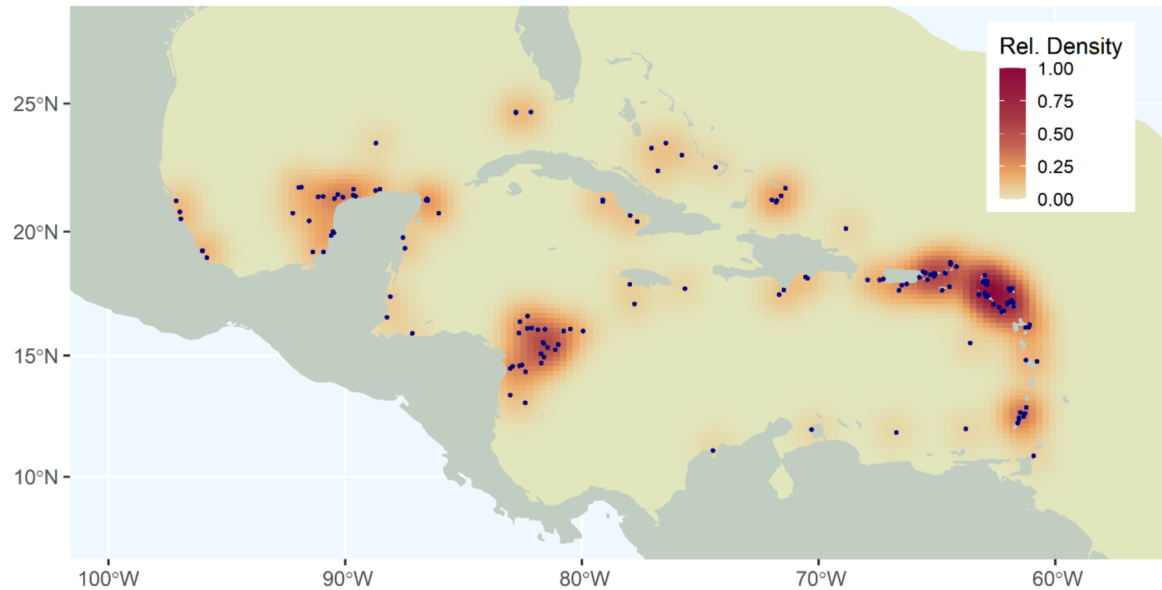

Figure 4. Relative density of foraging residency areas for hawksbill sea turtles (*Eretmochelys imbricata*) in the Wider Caribbean Region (N=158).

Accounting for bias to sampling sites within the inferred distribution of hawksbill residency areas would deemphasize the hotspot in the Leeward Islands, as a large proportion of telemetry originated in this area or neighboring islands (Hart et al. 2019, Maurer 2021, Soanes et al. 2022). In contrast, given the relative lack of tracking data sourced from the southwestern Caribbean, the hotspot within the Nicaragua Rise may be of particular importance. Turtles from throughout the Wider Caribbean migrated there after breeding, perhaps owing to prevailing westerly currents.

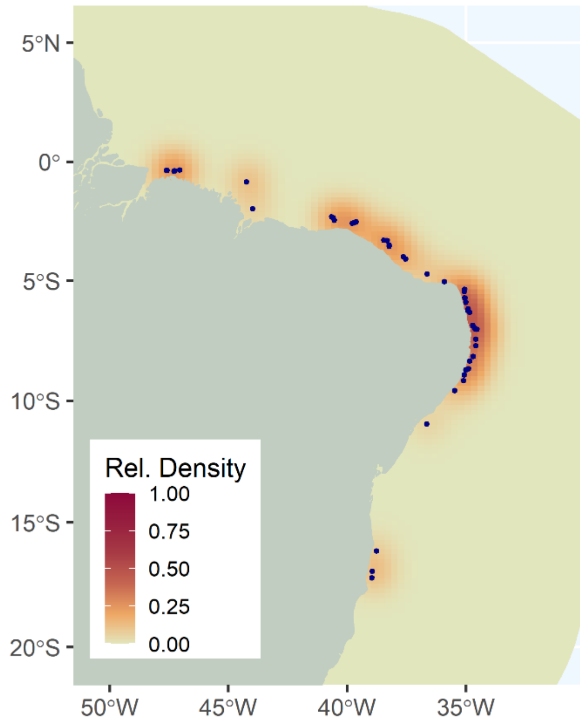

Figure 5. Relative density of residency areas for hawksbill turtles (*Eretmochelys imbricata*) in Brazil (N=48).

Considering this context of spatial bias, many of the spatial gaps in the inferred foraging distribution (i.e., the muted yellow area; Figures 3–5) that overlap neritic habitats are likely artefacts of the sampling distribution, and do not necessarily reflect a true absence of hawksbills. There are hawksbill nesting habitats adjacent to many of the gaps in the inferred distribution of residency areas, notably along the northern coasts of Colombia and Venezuela (Eckert & Eckert 2019). Thus, assuming that short-distance migrations are the mode for these rookeries and that proximal suitable habitats exist, turtles likely reside and forage nearby. Inference into true spatial distributions will improve as individuals are tracked from new locations.

Future work implementing approaches integrating spatial habitat data (i.e., habitat-informed species distribution modeling) would also help to overcome limits of sampling bias, i.e., by allowing for the identification of suitable habitats rather than relying solely on turtle occurrence. It is possible that some of the gaps we observed do indeed reflect unsuitable foraging habitat.

4.2 Migratory corridors

Observed migrations spanned the Wider Caribbean Region, creating a dense web of connectivity, and additionally traveled north and south along the Brazilian coast (Figures 6–7). Continuous representation of migratory densities largely mirrored the density of residency areas (Figure 8). This was unsurprising given that the modal migratory strategy was to move less than 200 km, which had the effect of concentrating migratory points near breeding areas (Figures 8–9). Nonetheless, the continuous surface does reflect high regional connectivity, particularly in the Caribbean Basin. Migratory strategies are deconstructed and presented by sampling site in Figure 9, which confirms unique patterns of egress, preferred movement corridors, and destination (high-use/foraging/residency) grounds associated with different sampling sites (i.e., nesting beaches).

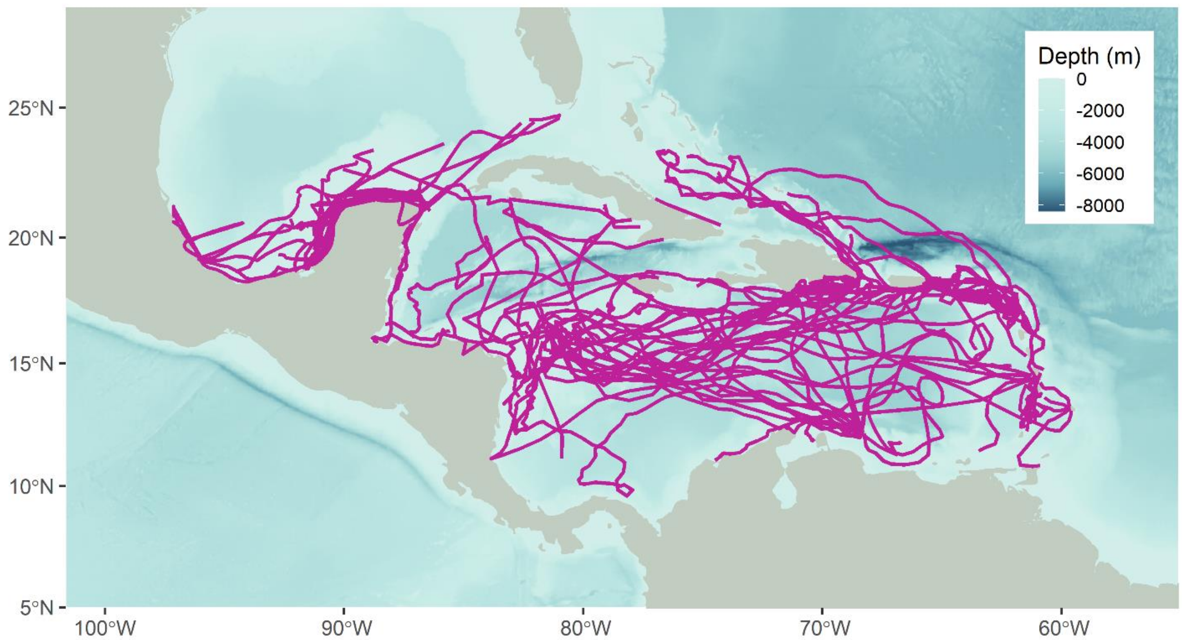

Figure 6. Migratory tracks of hawksbill sea turtles (*Eretmochelys imbricata*) in the Wider Caribbean Region (N=169). The blue background shows bathymetry using GEBCO data (General Bathymetric Chart of the Oceans, 2023).

Interestingly, there was a divergence in behavior between turtles sampled at insular versus continental land masses. Turtles nesting at sites with long, continuous coastlines, such as Mexico and Brazil, tended to exhibit a primary strategy of transit moving parallel to the coastline rather than venturing offshore. In contrast, insular turtles exhibited much more variation, with a high frequency of trans-basin movements apparent in the vector and raster patterns. This is a logical biological strategy, consistent with elevated degrees of philopatry documented for insular rookeries via population genetics (Levasseur et al. 2019). An island provides limited nesting and foraging habitats relative to a "mainland," and thus turtles have adapted to local conditions to ensure that they find suitable foraging areas and relocate nesting beaches. The divergence could also be explained to some degree by prevailing currents, which would pull Eastern Caribbean hawksbills westward, across the basin, a postulation supported by the observed migratory patterns parsed by sampling location (Figure 9). That is, turtles from the Eastern Caribbean traveled significant distances west, including migrations spanning the Caribbean Sea, whereas turtles from more western breeding habitats exhibited little connectivity with Eastern Caribbean foraging habitats.

As with inferred foraging densities, gaps in observed migratory corridors may not reflect a true absence of migrating hawksbills (Figures 8–9). Another caveat for our results is that we do not account for time or seasonality. Whereas hawksbills may remain in foraging areas for multiple years without leaving, supporting a concept of relatively static, non-seasonal foraging distributions, migrations typically span a few days to weeks. Nesting peaks in mid-summer for most rookeries, with arrivals and departures for individual turtles staggered throughout a reproductive season of several months (Beggs et al. 2007, Kendall et al. 2019). Thus, there is a temporal density pattern to migrations that is a crucial element for any efforts applying results to management. Future work with the synthesized dataset may partition information within designated time periods (e.g., seasons, years) to reveal such temporal patterns.

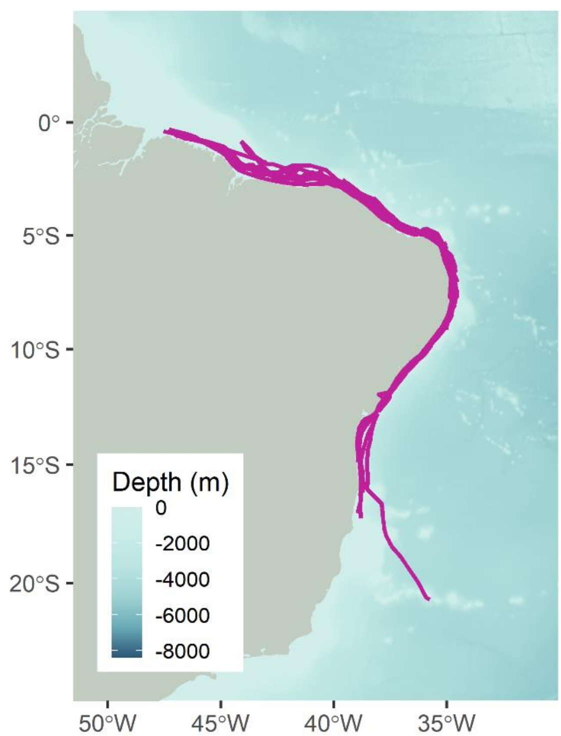

Figure 7. Hawksbill turtle (*Eretmochelys imbricata*) migrations in Brazil (N=51).

No hawksbills sampled within the Wider Caribbean migrated out of the region (Figure 6), nor did Brazilian turtles transit significant distances away from the continental coastline (Figure 7). This finding for hawksbills contrasts significantly with patterns observed in WA leatherback turtles (*Dermochelys coriacea*) that exhibit migrations of a much larger scale. For example, adults for the species often travel between habitats in the Caribbean and distant areas such as the Northwest Atlantic (Eckert 2006, Hays et al. 2006, Dodge et al. 2014). Behavioral variation underscores that each species presents a separate case with a specific set of biological traits, a distinct distribution, and therefore unique management needs.

4.3 Caveats and considerations

In addition to the caveats detailed above, here we offer further considerations to aid the interpretation of our findings. First, there are likely tracks that remain unknown to us. Second, some known datasets are missing from our analysis; notably, those from the Western Caribbean (e.g., Belize, Honduras, Nicaragua, and Costa Rica; Troëng et al. 2005) and a significant dataset from the Eastern Caribbean (Nevis). Prospective data contributors in these cases were generally supportive of the aims of a regional synthesis but cited publication conflicts. We are optimistic that more participants will join for future iterations of this analysis.

The spatial data products we present here may best be viewed as “living documents,” as we expect that inferred spatial patterns will change and evolve when new projects elect to contribute data in addition to when new animals are tracked. As this happens, we will periodically update regional estimates and disseminate new information. Nonetheless, a dataset of this size and scale is ideally suited to approaches such as species distribution modeling that can help to overcome such limitations.

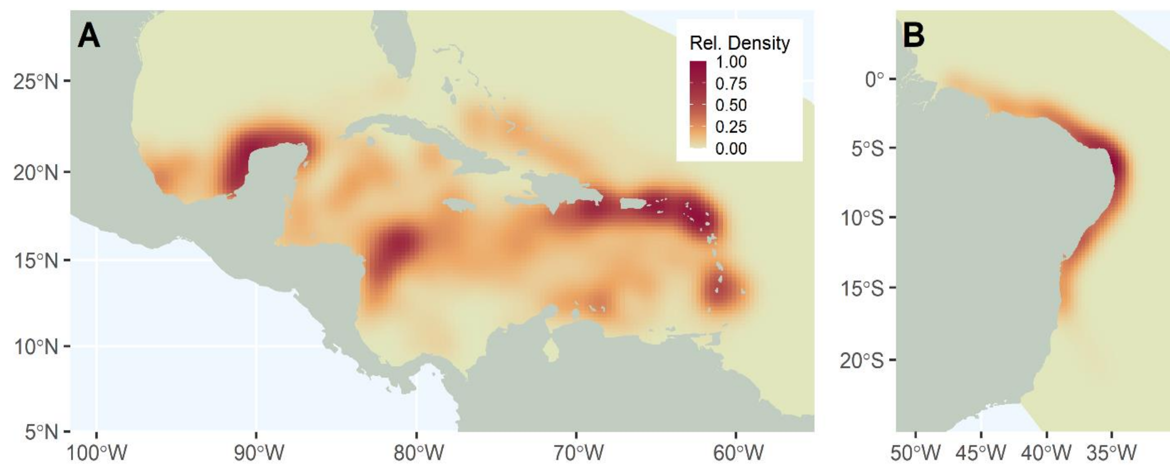

Figure 8. Migratory corridors for hawksbill sea turtles (*Eretmochelys imbricata*) in the Wider Caribbean Region (A) and Brazil (B). Continuous densities were computed from model-estimated locations for 220 migratory tracks. See Figure 9 for details of migratory corridors deconstructed and presented by sampling site.

A final, significant caveat for our results is that they were derived largely from adult females. Males made up just 6% of the adults of known sex, and we purposely omitted juveniles. While the survival of females of reproductive age is crucial to population growth, juvenile survival has been demonstrated to limit population growth for other species and locations, notably in contexts of high interaction with net-based fisheries (Crouse et al. 1987, Crowder et al. 1994). Coastal fisheries within the Wider Caribbean utilize a variety of methods (Salas et al. 2011), but this caveat may be especially relevant in locations with especially high rates of sea turtle bycatch. That is, information on adult distribution alone may be insufficient for supporting policymaking in support of population recovery.

Despite potential limits to inference into other demographic segments, our findings represent the most complete depiction of hawksbill space use in the WA to date. It is highly likely that adult females share space with males and juveniles; therefore, informing management efforts based on female space-use patterns is logical and based on best-available science. Future work integrating information on other demographic stages and additional data types (e.g., sightings) would be beneficial.

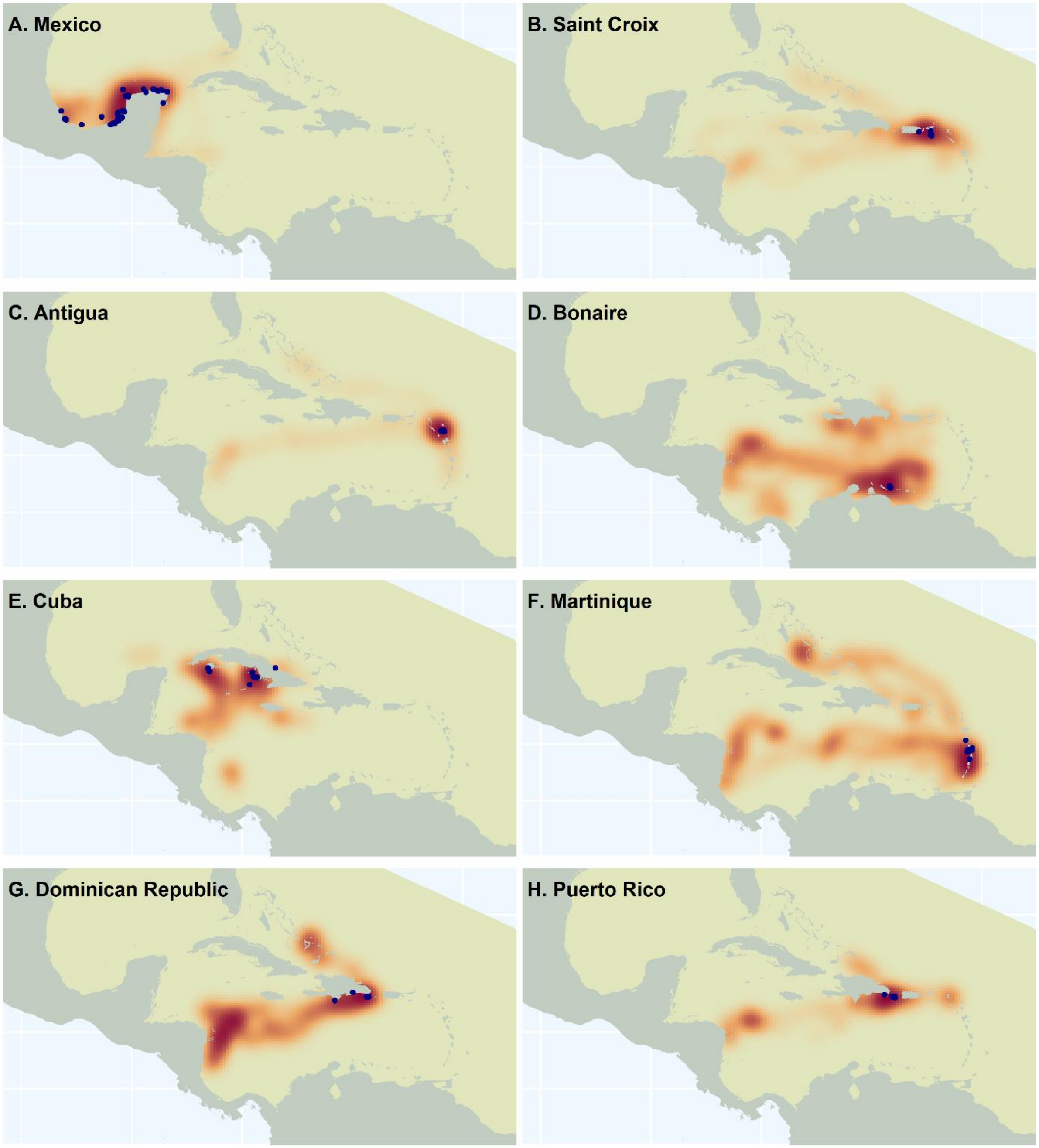

Figure 9. Hawksbill sea turtle (*Eretmochelys imbricata*) migratory corridors in the Wider Caribbean, presented by sampling site (see Table 1). Starting points (i.e., the first model-estimated locations for migratory tracks) are shown with dark blue points.

5 Conclusions

Our synthesis of hawksbill distributions provides a comprehensive representation of space use patterns in the WA. Our collated findings can inform spatial elements of regional conservation initiatives. Of conservation interest is an apparent dichotomy in bearing and destination between turtles originating (nesting) in the Greater and Lesser Antilles and those originating from more western continental rookeries. Preferred post-breeding movement corridors of Eastern Caribbean turtles appeared to associate with westward prevailing currents, whereas turtles from continental nesting habitats exhibited little connectivity with high-use areas identified in the Eastern Caribbean. We emphasize that a large number of management entities share jurisdiction over hawksbill habitats in the WA, and jurisdictional divisions are particularly complex in the Wider Caribbean (Figure 10). Thus, continuing to develop detailed maps of sea turtle distributions at local and regional scales is necessary to guide cross-jurisdictional collaboration and management of this, as with other, highly migratory species of marine megafauna.

Our methodological approach could be readily applied to other sea turtle species in the region, notably the leatherback (*Dermochelys coriacea*) and green turtle (*Chelonia mydas*). There are large bodies of telemetry work for both species, although data are biased to certain sampling sites with relatively high rates of transmitter deployment (as we have seen with hawksbills). Data primarily consist of Argos locations and would therefore benefit from the same modeling approach we employed here. Yet, key differences among species should frame distinct expectations. For instance, more immature green turtles have been sampled as compared to hawksbills (e.g., Doherty et al. 2020), so there is greater potential for inference into distributions at this stage. Adult green turtles in the Wider Caribbean tend to migrate within the region and are known to forage within some of the same subregions documented for hawksbills (Troëng et al. 2005a, Becking et al. 2016). However, adult nesting has a different distribution, with notable dominant rookeries in, e.g., Florida, USA and Costa Rica (Eckert & Eckert 2019), which may drive unique patterns in connectivity.

Distributional patterns for leatherbacks should be expected to differ significantly from hawksbill and green turtles, as they frequently migrate to forage well outside of the CAMAC working region (Eckert 2006, Hays et al. 2006). Thus, a focus on space use during migrations, and potentially breeding periods, would likely be prudent for adults. Incidental capture resulting from fisheries interaction is likely a key contributor to the ongoing decline of several global leatherback stocks (e.g., Ortiz-Alvarez et al. 2020), including the WA (Northwest Atlantic Leatherback Working Group 2018, Eckert & Hart 2021, Barragan et al. 2022). Thus, to complement telemetry data for adults, CAMAC would benefit from efforts to integrate any information available on the distribution of juveniles as well as breeding-age adults. Studies employing forms of distribution modeling, for instance dispersal modeling (Lalire & Gaspar 2019), have been conducted on leatherbacks and may be a key source of information.

As more data describing hawksbill movement and distributions are made available and secondary analyses are performed integrating information on environmental factors, we anticipate overcoming limitations inherent in our dataset via future updates to the analysis presented herein. Importantly, the synthesized data presented here offer an immediate opportunity to relate distributional patterns for *Critically Endangered* hawksbills (cf. IUCN RedList of Threatened Species) to anthropogenic threats. Bolstering our ability to mitigate such threats will build capacity to support population recovery within the region. Finally, the analysis presented herein could contribute meaningfully to initiatives that seek to define—and safeguard—ecological connectivity among marine protected areas and essential migratory pathways utilized by other imperiled marine megafauna.

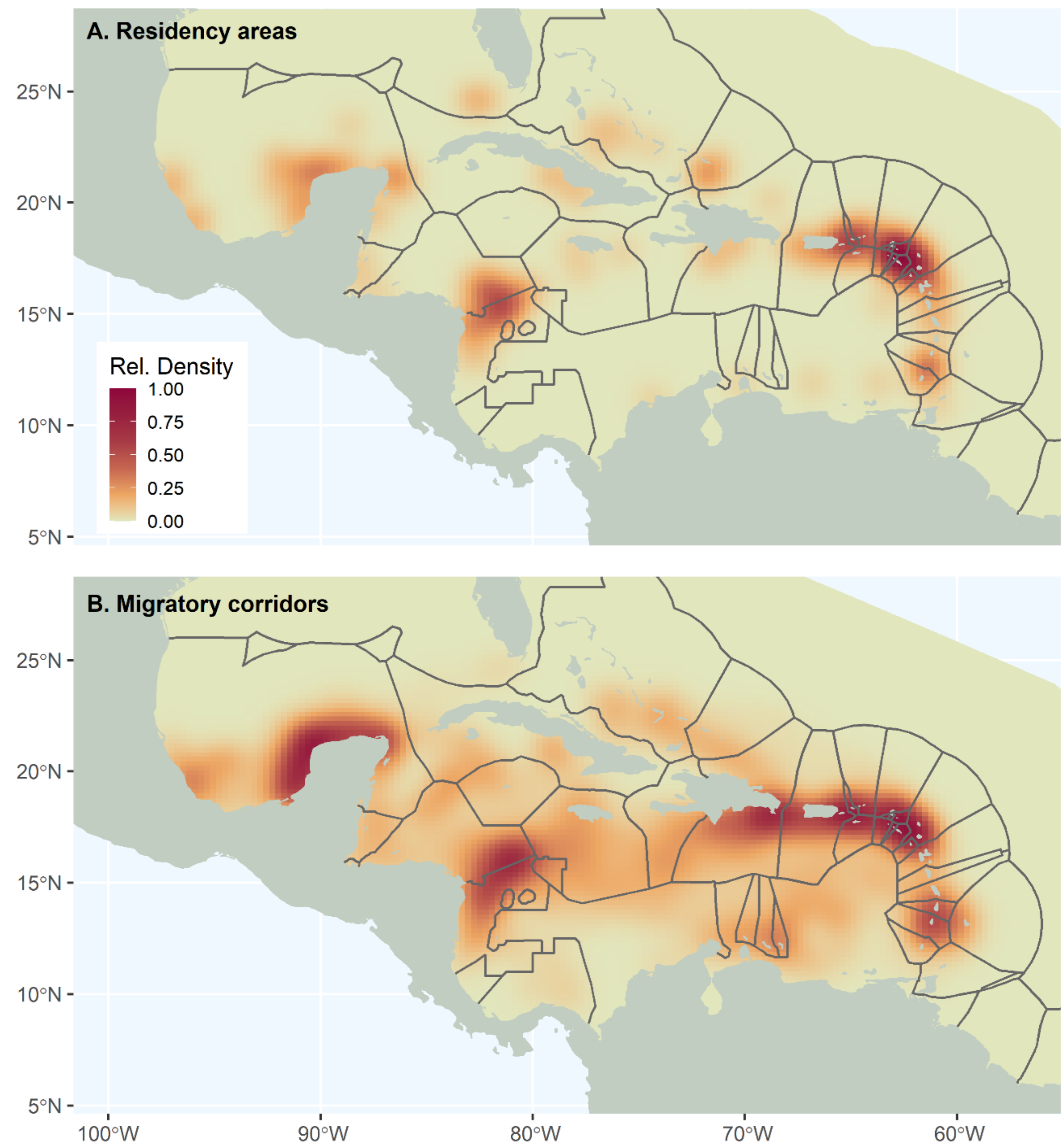

Figure 10. The distribution of residency (putative foraging) (A) and migratory corridor densities (B) for hawksbill sea turtles (*Eretmochelys imbricata*) in the Wider Caribbean Region in relation to maritime boundaries. Gray lines show exclusive economic zones (EEZ).

Acknowledgements

This project was only possible with the participation of data contributors from throughout the Western Atlantic. We recognize that our synthesis also benefited from the contributions of additional numbers of researchers through their efforts in field research and data management. We thank Dr. Claire Pusineri, Dr. Eduardo Cuevas, Dr. Scott Eckert, and Andrew Jesper for providing feedback on an earlier version of this report. This work was funded by the Regional Activity Centre for the Protocol Concerning Specially Protected Areas and Wildlife (SPAW-RAC) for the Wider Caribbean Region as part of the Caribbean Marine Megafauna and Anthropogenic Activities (CAMAC) initiative, with key support from Direction de l'Environnement, de l'Aménagement et du Logement (DEAL), Guadeloupe.

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Appendices

A. Data Sharing Agreement

July 2023

Dear Colleague:

We are excited about a new regional collaboration through which we will synthesize satellite telemetry data for hawksbill sea turtles (*Eretmochelys imbricata*) in the Wider Caribbean. The purpose of this project is to summarize foraging distributions and movement corridors at the regional level, pooling information across research projects to generate key products useful for regional management. Project success is wholly contingent on participation from data providers. That's where you come in!

The collaboration will be led by WIDECAST, with funding from UNEP's Caribbean Environment Programme (CEP), and its Regional Activity Centre for the Protocol concerning Specially Protected Areas and Wildlife (SPAW RAC) under the Cartagena Convention. The project specifically falls within a new initiative—"Caribbean Marine Megafauna and Anthropogenic Activities" (CAMAC)—aimed at developing tools to reduce the impacts of human activities on marine megafauna. The project, which will unfold in phases over multiple years, will initially focus on hawksbills as proof of concept. The hope is that similar synthesis approaches will follow for other Caribbean megafauna where telemetry data are available.

We are asking for collaborators to provide satellite telemetry data, which we will use in two ways:

(1) First, we will create spatial data products, maps, and a report summarizing foraging distributions and movement corridors for inclusion in the CAMAC project. These outputs will be completed by November 2023 (short timeline!) and will be used in later phases of the project designed to integrate information on anthropogenic impacts. Data providers will be credited in the Final Project Report and in the metadata for spatial data products.

(2) Second, we will build upon CAMAC products to produce a manuscript for peer review, with all data providers included as authors (unless otherwise requested). We will have a final draft prepared by Q3 2024 or earlier. Upon completion of this draft, all authors will be notified and given three weeks to review/edit and ultimately approve the manuscript prior to submission (target journal: *Endangered Species Research*). We invite interested coauthors to engage earlier, throughout the analytical and drafting stages. We recognize that in some cases more than one researcher contributing to a tracking dataset will qualify for authorship. To this end, we will engage with you to discuss your preference for authorship, based on data collected/provided and contributions to the manuscript.

This synthesis will naturally open avenues for further research, such as regional-scale evaluations of habitat use or overlap with anthropogenic activities. We invite data providers to suggest such efforts. Any future uses of telemetry data beyond activities 1 and 2 above will require new communication and approval from all data providers.

We aim to include as many relevant satellite tracking datasets as possible. The majority of these will be for nesting females, but we also encourage the contribution of data for males and juveniles. Please provide data via email. Alternatively, we can provide you a link to a google drive where you can upload your data directly. We are inviting the following data; example data are available here (note the linked workbook contains three separate spreadsheets).

- Argos and/or Fastloc-GPS data in a CSV file or similar (e.g., XLSX, TXT), preferably in raw form as provided by the data manager (e.g., Wildlife Computers).
    - Raw formatting will ensure consistency in naming conventions for data columns. Files should at minimum contain a transmitter ID column (e.g., "Ptt" or similar), date, location type (Argos or GPS), lat, lon, and measures of error (Argos: location quality, error radius/ellipse information; GPS: number of satellites, bad satellites, residual value).
    - Data will typically consist of a separate raw data file for each individual. Alternatively, a single file with all individuals would work well.
    - Templates provided show typical raw formatting, with required columns highlighted in yellow.
- An additional spreadsheet (CSV preferred) with biological information for the turtles tracked, where each individual is referenced to a transmitter ID number (i.e., "Ptt"). Please see the example template (third sheet) for more.
    - Data columns should include sex and, if available, body size and weight (i.e., SCL, CCL, SCW, CCW, mass).
    - Please also include data columns for sampling location (e.g., name of nesting beach or, ideally, coordinates in decimal degrees), sampling habitat (e.g., "nesting beach" or "in-water via net"), relevant notes on life history stage (e.g., "nesting female" or "reproductive male"), relevant transmitter programming details, and any information of note for interpreting telemetry. Relevant information would include, for example, the date and time of the final observed nest of the turtle (if available), or whether a transmitter stopped functioning before the turtle reached a foraging area.
- Thus, if you are submitting telemetry data for 10 turtles, we anticipate receiving 11 files: 10 individual files with raw location data, plus an accompanying spreadsheet with information on your 10 sampled turtles. Alternatively, the individual raw location files may be collated into a single file if easier for you. Should you have any questions, please do not hesitate to ask.

Analyses, report writing, and manuscript preparation will be led by Andrew Maurer, in collaboration with Karen Eckert. Your data will be stored on a private Google Drive and backed up on an external drive. It will not be shared with any other parties for any other use without the explicit consent of the provider.

The data will first be used to fit a switching state space model to distinguish migratory from nonmigratory periods of movement for all individuals. We will then focus on model output to identify foraging home ranges and migratory corridors. We will summarize these areas in both vector (i.e., point and line shapefile) and raster (i.e., continuous kernel density surface) formats. This dataset will also allow us to synthesize aspects of regional movement, including migratory distance and home range core area size.

We strongly encourage the inclusion of unpublished data. In the proposed scientific manuscript, your data will be presented alongside other regional data in a manner that should not preclude you from publishing a standalone manuscript in the future. At the request of data providers, we can provide analysis results for individual datasets that could be used in such standalone publications.

DATA DISCLAIMER: Your raw data will only be used for the purposes of conducting this satellite telemetry analysis and synthesis for the Wider Caribbean hawksbill turtle subpopulation. Your raw data will only be accessible to Dr. Andrew Maurer (NOAA – Southwest Fisheries Science Center) and Dr. Karen Eckert (WIDECAST) for the purposes of this analysis only. By sharing your data, you agree to allow us to perform spatial analyses of movement and distributions (in consultation with you), and to publish these results, with proper attribution, in a SPAW RAC Report and a peer-reviewed scientific journal article. Beyond these purposes, your data will not be disseminated, displayed, or otherwise made available without the expressed consent of you, the data provider.

Should you have any questions or concerns—either about this data use agreement or the broader project—we would be happy to discuss these concerns via email, phone, or video call.

Sincerely yours,

Andrew Maurer, PhD
NOAA Southwest Fisheries Science Center

Karen Eckert, PhD
WIDECAST

B. Individual Deployment Summaries

Transmitter deployment summaries for 268 individuals. Information is shown for datasets after data filtering. A sex of “U” denotes unknown.

Site	Transmitter ID	Sex	Locations	Start	End	Days Tracked
Anguilla	164371	Female	512	7/11/2017 7:39	10/2/2017 19:40	83.5
Anguilla	164372	Female	185	8/21/2018 0:03	9/23/2018 12:45	33.5
Anguilla	164375	Female	422	7/2/2017 0:10	12/15/2017 13:26	166.6
Anguilla	164376	Female	280	8/21/2018 0:01	10/2/2018 8:53	42.4
Anguilla	164377	Female	189	10/3/2017 13:37	1/2/2018 23:28	91.5
Anguilla	164387	Female	605	7/25/2018 0:59	11/7/2018 21:51	105.9
Anguilla	164388	Female	1639	7/14/2017 2:27	6/29/2018 12:29	350.4
Antigua	141941	Female	2514	8/15/2016 9:55	7/18/2017 22:10	337.5
Antigua	141942	Female	578	8/14/2016 9:39	10/24/2016 22:38	71.5
Antigua	141943	Female	219	8/13/2016 9:51	9/18/2016 13:09	36.1
Antigua	171813	Female	1339	8/4/2017 12:42	3/13/2018 11:02	220.9
Antigua	171814	Female	1570	8/3/2017 9:46	4/11/2018 13:00	251.1
Antigua	171816	Female	458	8/5/2017 8:52	11/7/2017 19:29	94.5
Antigua	172982	Female	1229	10/3/2017 13:44	4/11/2018 15:44	190.1
Antigua	172983	Female	668	10/2/2017 19:47	4/11/2018 1:29	190.2
Antigua	175613	Female	1403	6/29/2018 10:25	1/30/2019 13:16	215.2
Antigua	175614	Female	1206	8/3/2018 0:08	1/30/2019 12:59	180.6
Antigua	175615	Female	968	7/11/2018 22:48	1/30/2019 0:42	202.1
Antigua	176112	Female	1013	8/4/2018 2:30	1/30/2019 13:08	179.5
Antigua	176113	Female	907	8/17/2018 13:11	1/30/2019 15:23	166.1
Antigua	176114	Female	974	8/4/2018 0:51	1/30/2019 14:24	179.6
Antigua	176115	Female	727	8/15/2018 0:23	12/4/2018 0:24	111
Antigua	176116	Female	1181	8/13/2018 19:28	1/30/2019 15:21	169.9
Antigua	181294	Female	1205	8/1/2019 23:28	2/20/2020 12:48	202.6
Antigua	181295	Female	298	8/6/2019 0:18	10/9/2019 12:24	64.5
Antigua	181296	Female	177	7/28/2019 0:31	8/28/2019 23:46	32
Antigua	183821	Female	853	8/11/2019 0:43	12/7/2019 15:56	118.7
Antigua	183822	Female	3270	8/17/2019 8:49	9/8/2020 10:29	388.1
Antigua	8455	Female	1337	9/12/1998 5:40	11/24/1999 11:39	438.3
Antigua	8456	Female	840	10/16/1998 7:47	12/3/1999 13:00	413.3
Antigua	8552	Female	1134	10/25/1998 9:43	12/3/1999 10:07	404
Antigua	8553	Female	139	11/12/1998 9:47	9/26/1999 8:50	317.9
Antigua	999999	Female	688	9/30/2019 23:46	1/11/2020 20:07	102.9
Barbados	80269	Female	84	6/25/2010 22:05	9/5/2010 3:12	71.2
Barbados	80270	Female	46	7/4/2010 20:36	9/4/2010 5:35	61.4
Barbados	80271	Female	32	7/5/2010 7:06	9/6/2010 8:37	63.1
Barbados	80272	Female	54	7/9/2010 9:21	8/20/2010 8:34	42
Barbados	80273	Female	38	6/28/2010 9:54	9/6/2010 8:38	69.9

Barbados	8207	Female	34	8/21/1998 22:11	11/14/1998 1:38	84.2
Barbados	9998	Female	930	7/16/2011 10:27	3/2/2012 6:11	229.9
Bonaire	108447	Female	1876	10/14/2011 5:55	10/25/2012 1:37	376.8
Bonaire	108449	Female	888	9/13/2013 5:26	12/26/2013 21:54	104.7
Bonaire	43754	Female	343	10/27/2003 2:28	1/4/2004 23:02	69.9
Bonaire	43755	Female	197	11/2/2003 3:05	1/4/2004 9:05	63.2
Bonaire	52040	Male	211	7/13/2004 14:58	10/27/2004 22:15	106.3
Bonaire	52041	Male	408	6/9/2005 12:52	1/1/2006 20:21	206.4
Bonaire	52043	Female	310	10/12/2005 18:55	12/15/2005 23:46	64.2
Bonaire	52044	Female	212	10/27/2005 5:08	1/7/2006 11:53	72.3
Bonaire	52048	Female	672	8/1/2009 5:48	2/1/2010 2:05	183.9
Bonaire	52049	Female	467	9/16/2009 7:43	3/25/2010 20:52	190.5
Bonaire	52050	Female	482	9/3/2010 5:52	1/11/2011 22:19	130.7
Bonaire	52052	Female	535	10/8/2010 11:46	3/3/2011 2:30	145.7
Bonaire	60727	Female	1086	7/15/2007 21:06	4/30/2008 14:03	289.7
Bonaire	63848	Female	2767	8/27/2020 10:50	10/9/2021 15:45	408.2
Bonaire	8364	Female	369	11/23/2004 2:00	3/6/2005 4:32	103.1
Bonaire	99999	Female	433	7/14/2006 15:37	2/9/2007 1:34	209.5
Brazil	146293	Female	215	2/25/2015 1:00	5/2/2015 18:48	66.7
Brazil	146294	Female	332	2/28/2015 0:37	4/18/2015 20:27	49.8
Brazil	146296	Female	1166	3/5/2015 1:24	2/9/2016 12:10	341.4
Brazil	146297	Female	2329	3/19/2015 0:08	4/14/2016 16:11	392.7
Brazil	146298	Female	3150	1/17/2016 11:57	9/17/2016 10:51	243.9
Brazil	146299	Female	879	1/28/2016 9:17	5/10/2016 19:36	103.4
Brazil	146300	Female	5202	2/10/2016 3:58	6/30/2017 9:30	506.2
Brazil	146301	Female	3575	3/11/2016 11:08	7/12/2017 17:30	488.2
Brazil	146302	Female	709	4/7/2017 4:55	11/1/2017 21:30	208.7
Brazil	146304	Female	1729	1/18/2018 0:24	8/19/2018 18:16	213.7
Brazil	146305	Female	150	5/6/2015 15:21	6/14/2015 21:26	39.3
Brazil	146306	Female	295	2/27/2015 3:31	4/26/2015 20:04	58.6
Brazil	146308	Female	494	3/5/2015 21:01	7/18/2015 21:59	135
Brazil	146309	Female	467	3/8/2015 23:47	8/8/2015 23:42	153
Brazil	146310	Female	474	3/22/2015 13:08	8/8/2015 22:49	139.4
Brazil	146311	Female	523	3/29/2015 4:44	7/12/2015 21:58	105.7
Brazil	146312	Female	718	1/26/2016 7:18	6/19/2016 8:42	145
Brazil	146313	Female	756	2/7/2016 4:21	7/5/2016 7:39	149.1
Brazil	146314	Female	789	2/8/2016 8:33	7/22/2016 7:13	164.9
Brazil	146315	Female	280	2/10/2016 11:00	4/10/2016 18:39	60.3
Brazil	146316	Female	179	2/27/2016 3:52	4/20/2016 11:46	53.3
Brazil	146317	Female	372	2/29/2016 8:24	5/15/2016 6:40	75.9
Brazil	146318	Female	446	3/30/2016 4:31	8/29/2016 11:37	152.3
Brazil	146319	Female	2143	5/2/2016 12:43	3/19/2018 21:50	686.4
Brazil	146320	Female	345	2/22/2017 5:46	6/3/2017 20:56	101.6
Brazil	146322	Female	348	4/13/2017 4:38	12/29/2017 5:07	260.1
Brazil	41572	Female	2850	2/18/2018 8:29	9/6/2019 7:30	564.9

Brazil	41573	Female	1379	3/18/2018 5:02	3/19/2019 19:06	366.6
Brazil	41581	Female	2237	12/20/2018 7:49	10/4/2020 8:56	654
Brazil	41582	Female	3171	12/29/2018 19:54	3/4/2020 10:37	430.6
Brazil	41585	Female	2162	4/13/2019 0:24	9/21/2020 1:39	527.1
Brazil	41589	Female	1702	3/18/2018 0:03	9/26/2018 0:12	192
Brazil	41592	Female	1331	3/15/2018 23:37	6/16/2018 18:44	92.8
Brazil	41610	Female	3052	4/11/2019 2:57	9/26/2019 22:41	168.8
Brazil	55608	Female	113	2/5/2005 9:16	1/18/2006 1:24	346.7
Brazil	55609	Female	7	2/7/2005 19:48	2/21/2005 2:36	13.3
Brazil	55610	Female	280	2/6/2005 6:09	10/22/2005 23:25	258.7
Brazil	55611	Female	246	2/7/2005 4:15	10/3/2005 0:36	237.8
Brazil	55612	Female	266	2/10/2005 3:41	12/28/2005 0:12	320.9
Brazil	55613	Female	34	2/10/2005 1:51	2/28/2005 19:51	18.8
Brazil	55614	Female	20	2/11/2005 3:29	3/20/2005 20:16	37.7
Brazil	55615	Female	344	2/11/2005 5:08	3/6/2007 11:48	753.3
Brazil	55616	Female	330	2/11/2005 7:25	1/26/2007 6:21	714
Brazil	55617	Female	465	2/12/2005 3:19	7/24/2006 12:34	527.3
Brazil	55618	Female	166	2/22/2005 6:25	4/19/2005 4:10	55.9
Brazil	55619	Female	36	2/25/2005 4:10	3/12/2005 18:57	15.6
Brazil	55620	Female	445	2/26/2005 5:39	7/7/2006 21:09	496.6
Brazil	55621	Female	365	2/27/2005 3:47	3/4/2007 13:41	735.4
Brazil	55622	Female	57	3/28/2005 22:43	10/19/2005 4:00	204.2
Brazil	64463	Female	1540	2/4/2020 20:14	8/28/2020 7:41	205.4
Brazil	64465	Female	1211	2/11/2020 0:02	6/25/2020 19:32	135.8
Brazil	64466	Female	1934	2/29/2020 0:07	8/28/2020 22:01	181.9
Brazil	64468	Female	4315	3/28/2020 3:02	6/24/2021 1:18	452.9
Brazil	64472	Female	1676	2/7/2019 0:00	10/10/2019 11:37	245.4
Brazil	64477	Female	267	4/5/2019 8:25	5/1/2019 23:27	26.6
Brazil	64481	Female	633	3/19/2019 8:55	6/6/2019 21:48	79.5
Cuba	15496	Unknown	11	9/30/1998 19:41	12/23/1998 13:48	83.8
Cuba	15497	Unknown	36	10/24/1999 5:43	7/29/2000 17:44	279.5
Cuba	15498	Unknown	56	11/20/1998 9:32	5/27/2000 14:17	554.2
Cuba	15499	Unknown	37	9/19/1999 4:00	11/7/1999 22:06	49.8
Cuba	15500	Unknown	154	11/7/1998 16:46	10/7/1999 20:23	334.1
Cuba	20388	Unknown	102	10/30/1999 5:10	12/14/2000 16:15	411.5
Cuba	20414	Unknown	93	12/6/1999 15:37	3/18/2001 17:02	468.1
Cuba	20415	Unknown	35	1/15/2000 4:42	1/27/2000 20:04	12.6
Cuba	27241	Unknown	35	3/25/1997 0:50	5/2/1997 11:49	38.4
Cuba	27242	Unknown	5	3/25/1997 0:48	8/7/1997 12:35	135.4
Cuba	27243	Unknown	16	10/14/1997 18:47	5/26/1998 20:53	224.1
Cuba	27245	Unknown	7	7/22/1998 13:54	8/10/1998 7:24	18.7
Cuba	27248	Unknown	25	10/11/1997 18:58	11/12/1997 15:31	31.9
Cuba	27249	Unknown	36	10/7/1997 1:53	12/24/1997 16:47	78.7
Cuba	27250	Unknown	10	7/19/1996 12:02	8/6/1996 17:53	18.2
Dominican Republic	80007	Female	1128	10/1/2008 3:43	5/19/2010 1:48	594.9

Dominican Republic	80008	Female	2737	10/27/2008 10:05	9/27/2010 10:17	700
Dominican Republic	80009	Female	87	12/6/2008 0:56	1/2/2009 15:45	27.6
Dominican Republic	80010	Female	1671	9/19/2008 1:41	12/5/2009 18:20	442.7
Dominican Republic	80011	Female	456	8/12/2008 1:20	10/3/2008 11:26	52.4
Dominican Republic	80012	Female	698	11/2/2008 22:03	11/2/2009 10:46	364.5
Dominican Republic	85701	Female	3140	8/28/2008 10:06	8/20/2011 13:34	1087.1
Dominican Republic	85702	Female	5260	8/30/2008 1:04	8/15/2011 18:59	1080.7
Dominican Republic	85703	Female	918	8/7/2009 7:51	12/22/2009 16:22	137.4
Dominican Republic	85704	Female	3514	9/4/2009 10:35	8/21/2011 6:32	715.8
Jamaica	7665	Female	178	9/14/2000 0:52	1/24/2001 12:01	132.5
Jamaica	7677	Female	299	7/19/2000 0:32	5/3/2001 0:18	288
Jamaica	8442	Female	1209	10/6/1998 13:07	12/3/1999 11:51	423
Jamaica	8443	Female	925	10/6/1998 0:02	11/14/1999 12:00	404.5
Martinique	130772	Male	684	9/29/2013 13:50	2/24/2014 12:43	148
Martinique	130777	Male	1073	11/13/2013 13:39	12/6/2014 23:38	388.4
Martinique	150117	Female	79	8/15/2015 22:11	1/15/2016 10:16	152.5
Martinique	150118	Female	146	8/23/2015 8:32	12/24/2015 20:36	123.5
Martinique	150120	Female	93	8/15/2015 22:12	11/25/2015 22:24	102
Martinique	150121	Female	134	8/19/2015 10:04	10/23/2015 15:33	65.2
Martinique	150123	Female	872	8/17/2015 5:06	1/24/2017 13:20	526.4
Martinique	162264	Female	566	8/5/2016 5:21	1/23/2017 23:04	171.8
Martinique	162265	Female	548	8/3/2016 9:51	11/13/2016 23:21	102.6
Martinique	162266	Female	379	8/10/2016 17:17	1/23/2017 23:03	166.3
Martinique	162267	Female	474	7/26/2016 18:26	8/30/2016 2:05	34.3
Martinique	162268	Female	313	7/12/2016 22:09	1/6/2017 10:11	177.5
Martinique	162269	Female	982	8/12/2016 13:22	1/20/2017 12:24	161
Mexico	102109	Female	577	6/29/2014 16:23	2/1/2015 22:45	217.3
Mexico	102110	Female	236	7/8/2014 9:51	11/10/2014 16:50	125.3
Mexico	130945	Female	1036	7/1/2013 15:56	12/10/2013 4:03	161.5
Mexico	130946	Female	1726	6/30/2013 15:14	1/18/2014 12:08	201.9
Mexico	130947	Female	1194	7/11/2013 15:28	1/15/2014 0:59	187.4
Mexico	152170	Female	507	5/31/2016 17:37	12/13/2016 7:19	195.6
Mexico	152171	Female	438	4/27/2016 4:42	8/12/2016 5:32	107
Mexico	152176	Female	311	5/19/2016 2:24	9/11/2017 17:34	480.6
Mexico	152177	Female	1211	6/10/2016 3:20	7/27/2017 16:31	412.5
Mexico	152180	Female	384	5/18/2016 6:03	9/6/2016 5:52	111
Mexico	152182	Female	120	6/23/2016 4:10	8/9/2016 17:46	47.6
Mexico	152183	Female	458	5/19/2016 4:52	7/31/2016 14:56	73.4
Mexico	152192	Female	267	6/28/2016 9:32	8/22/2016 6:59	54.9
Mexico	152193	Female	71	6/30/2016 18:35	7/25/2016 1:32	24.3
Mexico	152199	Male	249	6/14/2017 17:14	8/12/2017 4:54	58.5
Mexico	152200	Female	253	5/31/2016 19:15	11/22/2016 15:09	174.9
Mexico	152203	Female	350	7/13/2016 6:31	1/13/2017 15:22	184.4
Mexico	152207	Female	306	7/26/2016 18:24	10/22/2016 18:22	88
Mexico	152216	Female	242	6/28/2017 2:31	12/30/2017 8:56	185.3

Mexico	152218	Female	329	7/19/2017 17:47	10/6/2017 3:27	78.4
Mexico	152225	Female	565	5/27/2016 5:32	12/27/2016 17:45	214.6
Mexico	152227	Female	401	5/19/2016 18:21	7/27/2016 5:08	68.4
Mexico	152228	Female	1305	5/18/2016 20:39	4/28/2017 5:49	344.4
Mexico	152231	Female	1117	6/11/2016 6:02	8/19/2017 8:15	434.1
Mexico	152247	Female	154	7/27/2017 18:15	12/24/2017 19:19	150.1
Mexico	152252	Female	150	6/3/2016 2:50	12/27/2017 4:28	572.1
Mexico	6666	Female	104	7/29/1999 0:00	1/19/2000 0:00	174
Mexico	75369	Female	1453	5/29/2007 0:01	3/14/2009 10:05	655.4
Mexico	75370	Female	1544	5/15/2007 15:59	11/15/2008 22:36	550.3
Mexico	75371	Female	166	5/15/2007 17:34	10/25/2007 20:45	163.1
Mexico	75372	Female	384	6/21/2007 9:27	12/2/2007 12:42	164.2
Mexico	8350	Female	101	7/28/1999 0:00	1/20/2000 0:00	176
Mexico	8365	Female	97	7/29/1999 0:00	1/19/2000 0:00	174
Mexico	8366	Female	40	8/1/1999 0:00	9/22/1999 0:00	52
Mexico	Bani	Female	31	7/27/2013 0:00	8/27/2013 0:00	31
Mexico	Campechanita	Female	429	4/20/2013 0:00	9/24/2014 0:00	522
Mexico	Celestina	Female	180	7/12/2011 0:00	4/14/2012 0:00	277
Mexico	Gaby	Female	118	7/3/2007 0:00	11/8/2007 0:00	128
Mexico	Genoveva	Female	312	6/6/2013 14:12	12/15/2013 17:08	192.2
Mexico	Hach	Female	232	8/2/2007 0:00	7/8/2008 0:00	341
Mexico	Jania	Female	153	8/2/2007 0:00	1/27/2008 0:00	178
Mexico	Jolbej	Female	144	7/14/2006 0:00	12/27/2006 0:00	166
Mexico	Kaansaj	Female	280	7/15/2006 0:00	11/12/2007 0:00	485
Mexico	Ponchita	Female	112	5/16/2007 0:00	10/6/2007 0:00	143
Mexico	Poxy	Female	295	7/20/2013 0:00	9/24/2014 0:00	431
Mexico	Shira	Female	35	7/16/2007 0:00	11/10/2007 0:00	117
Mexico	Tormenta	Female	158	8/11/2013 0:00	9/23/2014 0:00	408
Mexico	Vicky	Female	204	7/15/2007 0:00	2/23/2008 0:00	223
Mexico	Viwarope	Male	29	7/29/2011 0:00	9/26/2011 0:00	59
Mexico	Xenita	Female	106	4/26/2007 0:00	10/30/2007 0:00	187
Mexico	Xinxinbaal	Female	318	7/18/2006 0:00	10/3/2007 0:00	442
Montserrat	214198	Female	3009	8/18/2021 6:36	4/20/2022 14:38	245.3
Puerto Rico	22127	Female	180	11/21/1998 15:11	2/9/2000 7:21	444.7
Puerto Rico	42594	Male	160	9/14/2003 1:55	10/25/2003 20:45	41.8
Puerto Rico	42595	Male	91	9/14/2003 13:36	10/25/2003 8:10	40.8
Puerto Rico	7681	Male	568	9/16/2002 15:14	8/14/2003 20:02	332.2
Puerto Rico	8178	Female	997	11/5/1998 7:30	7/10/2000 5:06	612.9
Puerto Rico	8209	Female	705	11/6/1998 9:29	5/25/2000 18:25	566.3
Puerto Rico	8349	Female	1393	11/9/1998 6:57	10/31/2003 19:53	1817.5
Puerto Rico	8444	Male	1105	9/16/2002 10:31	10/24/2003 22:28	403.5
Puerto Rico	8454	Male	677	11/12/2002 12:32	8/26/2003 22:15	287.4
Saint Croix	108082	Female	1600	8/28/2011 5:40	10/17/2012 17:12	416.5
Saint Croix	108083	Female	1144	8/28/2011 7:29	9/20/2012 5:46	388.9
Saint Croix	108084	Female	1765	8/28/2011 5:40	3/31/2013 18:01	581.5

Saint Croix	108085	Female	2735	8/26/2011 6:00	4/16/2013 20:08	599.6
Saint Croix	108087	Female	1856	8/27/2011 1:25	9/10/2012 13:02	380.5
Saint Croix	108088	Female	399	8/25/2011 8:41	11/3/2011 1:20	69.7
Saint Croix	108089	Female	952	8/28/2011 5:18	5/9/2012 14:01	255.4
Saint Croix	109787	Female	148	8/25/2011 0:27	10/22/2011 21:22	58.9
Saint Croix	109788	Female	1387	8/26/2011 1:51	2/10/2013 23:42	535
Saint Croix	121285	Female	1244	8/9/2012 10:33	5/4/2013 21:50	268.5
Saint Croix	121287	Female	557	8/4/2012 7:02	11/6/2012 15:03	94.4
Saint Croix	121294	Female	2764	8/8/2012 7:46	10/9/2015 2:48	1156.8
Saint Croix	121295	Female	1575	8/2/2012 7:24	8/19/2013 22:28	382.6
Saint Croix	121297	Female	1076	8/2/2012 7:25	4/4/2013 13:35	245.3
Saint Croix	121298	Female	2191	7/31/2012 10:39	12/27/2013 8:25	513.9
Saint Croix	121299	Female	2018	7/31/2012 0:26	6/4/2013 11:31	308.5
Saint Croix	130976	Female	869	7/30/2013 5:09	11/14/2013 8:09	107.2
Saint Croix	130977	Female	1117	7/31/2013 13:00	1/13/2014 16:09	166.2
Saint Croix	130978	Female	1257	7/31/2013 4:55	5/13/2014 14:09	286.4
Saint Croix	130979	Female	645	8/2/2013 6:18	11/21/2015 18:20	841.5
Saint Croix	130980	Female	910	8/1/2013 9:11	6/20/2014 21:04	323.5
Saint Croix	130981	Female	620	8/3/2013 6:03	12/21/2013 12:32	140.3
Saint Croix	130983	Female	2701	7/30/2013 5:10	5/25/2016 21:20	1030.7
Saint Croix	137790	Female	1950	8/5/2014 8:47	11/10/2015 0:01	461.7
Saint Croix	137791	Female	1854	8/6/2014 2:28	9/27/2015 18:38	417.7
Saint Croix	137793	Female	1085	8/7/2014 2:06	5/28/2015 18:06	294.7
Saint Croix	151155	Female	976	8/6/2015 5:28	5/3/2016 11:34	271.3
Saint Croix	151157	Female	1801	8/6/2015 5:28	7/27/2016 23:59	356.8
Saint Croix	151162	Female	1372	8/4/2015 9:40	9/3/2016 6:28	395.9
Saint Croix	151163	Female	1675	8/9/2015 6:33	1/13/2017 23:18	523.7
Saint Croix	151164	Female	759	8/8/2015 20:54	4/9/2016 21:53	245
St Eustatius	60725	Female	338	9/8/2006 8:20	2/1/2007 3:03	145.8
St Maarten	60726	Female	210	10/11/2005 2:45	12/18/2005 11:21	68.4
Turks and Caicos	90736	Male	3418	9/23/2009 2:05	10/9/2011 14:06	746.5
Turks and Caicos	90738	Male	1584	10/2/2009 14:24	7/4/2011 14:13	640
Turks and Caicos	90739	Male	5286	10/1/2009 2:51	5/20/2013 21:38	1327.8
Turks and Caicos	90741	Female	6868	10/13/2009 6:22	10/26/2013 14:29	1474.3

WIDECAST

Wider Caribbean Sea Turtle Conservation Network

"Working together to build a future where all inhabitants of the Wider Caribbean Region, human and sea turtle alike, can live together in balance."

The Wider Caribbean Sea Turtle Conservation Network (WIDECAST) is a regional coalition of experts and a Partner Organization to the U.N. Environment Programme's Caribbean Environment Programme. WIDECAST was founded in 1981 in response to a recommendation by the IUCN/CCA *Meeting of Non-Governmental Caribbean Organizations on Living Resources Conservation for Sustainable Development in the Wider Caribbean* (Santo Domingo, 26-29 August 1981) that a "Wider Caribbean Sea Turtle Recovery Action Plan should be prepared ... consistent with the Action Plan for the Caribbean Environment Programme."

WIDECAST's vision for achieving sea turtle recovery on a regional scale has focused on bringing the best available science to bear on sea turtle management and conservation, empowering people to make effective use of that science in the policy-making process, and providing a mechanism and a framework for cooperation within and among nations. By involving stakeholders at all levels and encouraging policy-oriented research, WIDECAST puts science to practical use in conserving biodiversity and advocates for grassroots involvement in decision-making and project leadership.

Emphasizing initiatives that strengthen capacity within participating countries and institutions, the network develops and replicates pilot projects, provides technical assistance, enables coordination in the collection, sharing and use of information and data, and promotes strong linkages between science, policy, and public participation in the design and implementation of conservation actions. Working closely with local communities and resource managers, the network has also developed standard management guidelines and criteria that emphasize best practices and sustainability, ensuring that current utilization practices, whether consumptive or non-consumptive, do not undermine sea turtle survival over the long term.

With Country Coordinators in more than 40 Caribbean nations and territories, WIDECAST is uniquely able to facilitate complementary conservation action across range States, including strengthening legislation, encouraging community involvement, and raising public awareness of the endangered status of the region's six species of migratory sea turtles. As a result, most Caribbean nations have adopted a national sea turtle management plan, poaching and illegal product sales have been dramatically reduced or eliminated at key sites, major nesting beaches are protected, many of our largest breeding colonies are monitored on an annual basis, alternative livelihood models are increasingly available for rural areas, and citizens are mobilized in support of conservation action. You can join us! Visit www.widecast.org for more information.

WWW.WIDECAST.ORG