

5th **CARIBAEA** INITIATIVE
Research & Conservation ———
————— **CONFERENCE**



Book of Abstracts

- **Date:** 10 - 12 June 2025
- **Location:** Karibea Sainte Luce hotel, Martinique
- **Information & programme:** <https://www.caribaea.org/conference-2025/>



Oral presentations

The impact of urbanization on native and invasive species
A case study of the coexistence between *Anolis oculatus* and *Anolis*
***crisatellus* in Dominica**

Norma Anthony

Canefield East, Roseau, Commonwealth of Dominica

Urbanization and biological invasions are key drivers of biodiversity loss and ecosystem change. Understanding how native and invasive species interact in urban environments is critical for informing conservation strategies. This study investigates the behavioral interactions between the native *Anolis oculatus* and the invasive *Anolis crisatellus* in Dominica, examining the effects of urban disturbance on species coexistence. Using a multivariate analysis of variance (MANOVA), we analyzed approach, flight, and final distances, as well as perch height and diameter, across four sites characterized by varying levels of human disturbance. Data were collected over a three-month period through standardized behavioral observations and ecological measurements. Results revealed significant interactions between disturbance and site ($p < 0.001$), and between species and disturbance ($p < 0.021$), indicating that both urbanization and species identity influence behavioral responses. *A. crisatellus* was more prevalent in disturbed habitats, while *A. oculatus* was more dominant in undisturbed areas, displaying adaptive shifts in perch use and escape behavior. These findings suggest that urbanization facilitates niche divergence and may mediate species coexistence through behavioral adaptation. The study highlights the importance of assessing early-stage interactions between native and invasive species to better predict ecological outcomes of urban expansion.

Quantifying the population density and distribution of the *Amazona*
***imperialis* and *Amazona arausiaca* of the island of Dominica post Hurricane**
Maria

Garry Auguiste¹, Paul Reillo², Stephen Durand, Henri Valles¹

¹*The University of the West Indies Cavehill Campus, Barbados*

²*The Rare Species Conservatory Foundation, FL, USA*

Dominica's endemic sisserou/imperial parrot (*Amazona imperialis*) and jaco/red-necked Parrot (*Amazona arausiaca*) are crucial rainforest conservation symbols. These critically endangered and vulnerable species, respectively, faced severe habitat and population reduction from category 5 Hurricane Maria in 2017. Recent research (2023-2024) employs GPS/GIS direct count methods for population density, distribution, and recovery assessment. Twenty field

surveys generated density estimates and identified environmental factors influencing parrot distribution. Statistical models considering forest habitat features were used to extrapolate population size estimates over a 15,300-ha target area. Mean elevation was a primary driver for sisserou density and distribution, while forest recovery was for jacos. Population estimates for the target area were 45-54 sisserous and 542-542 jacos. These figures support the recent IUCN conservation status assigned post-Hurricane Maria. No evidence of a southern sisserou population was found, suggesting a potential local extinction like the aftermath of Hurricane David in 1979. However, further investigation is needed before this can be confirmed. Both species showed recovery signs, with jaco demonstrating stronger recovery. There was no correlation between the species' abundances, indicating that one species' distribution cannot predict the others. Conservation efforts should prioritize the more vulnerable sisserou. The forest shows signs of good recovery, and a few active nests were discovered. Continuous monitoring is necessary to refine the population estimates and distribution data. Training a new generation of local researchers in parrot monitoring is recommended for the ongoing protection of Dominica's nationally and culturally significant endemic parrots.

Are tropical oceanic islands overlooked? Knowledge gaps regarding the vulnerability of amphibians to global anthropogenic threats

Renoir J. Auguste, Amy E. Deacon, & Mark F. Hulme

Department of Life Sciences, The University of the West Indies, Saint Augustine, Trinidad and Tobago

Climate change and land use change are major threats to amphibian conservation worldwide. However, amphibians on oceanic islands appear to have been overlooked in their vulnerability to global anthropogenic threats. Here, we aimed to determine whether there are gaps in research effort evaluating amphibian vulnerability to global threats from true oceanic islands. We undertook a systematic review of the literature focussing on experimental studies covering a 24-year period (1998–2022) to evaluate whether there are knowledge gaps from oceanic islands specifically in relation to (i) geographic scope, (ii) taxonomic representation, (iii) life stage assessment, and (iv) research factors and responses analysed. From 327 articles on climate change and 451 on land use change, 18 studies were from oceanic islands, and all 18 were on anurans only. The distribution of the scientific community conducting the studies on oceanic islands had fewer than 20% affiliated with an oceanic-island institution. Based on these 18 studies, assessments on a variety of families, and on life stages other than post-metamorphic adult individuals, were limited. We also found uneven research effort into factors and responses analysed on oceanic island amphibians; analyses related to temperature and distribution are well represented, but salinity and biochemical responses poorly evaluated.

This scarcity and unevenness in research from oceanic islands limit our understanding of the full impact of these threats on amphibians. We discuss potential reasons for these gaps and make recommendations for addressing them. Specifically, to include more island biologists in training and research activities and greater equitable distribution of resources.

Biodiversity, insects, and ecological resilience in Haiti: From scientific evidence to strategic action

Pierre Michard Beaujour

*UN Environment Programme, United Nations Avenue, Gigiri Nairobi, Kenya
CARIBAEA INITIATIVE 37, rue Jean Jaurès, Le Raizet, 97139 Les Abymes, Guadeloupe*

Entomological research in Haiti remains relatively underdeveloped despite the country's exceptional ecological importance and the accelerating pace of environmental degradation. This presentation highlights the value of insects, particularly pollinators and freshwater taxa, as bioindicators of ecological health and tools for conservation planning. Drawing from three recent studies conducted in diverse ecosystems across the country, I provide a general overview of the patterns and drivers of insect diversity in Haiti, while advocating for a stronger integration of entomology into national biodiversity strategies.

These studies, carried out across urban, peri-urban, and natural landscapes, revealed notable spatial variability in insect communities, shaped by land use, elevation, habitat type, and anthropogenic pressures. Insect richness and composition varied significantly not only between protected areas and degraded sites, but also within cities, where agroforestry systems and forest remnants demonstrated unexpected conservation value. Freshwater surveys uncovered high levels of taxonomic uniqueness and beta diversity among odonate species, often driven by factors such as altitude, riparian vegetation, and water quality.

Despite challenges in taxonomic identification due to limited local expertise and resources, the studies produced valuable baseline data, recorded rare and culturally significant species, and laid a methodological foundation for long-term biodiversity monitoring. These findings emphasize the ecological importance of preserving habitat mosaics and the urgent need to build national capacity in entomological research.

In conclusion, we will introduce a biodiversity assessment project led by UNEP in Southern Haiti (Grand Sud), which combines biological field surveys with community-based socio-environmental assessments. This effort aims to bridge scientific data and local knowledge to inform inclusive conservation strategies.

This presentation contributes to the broader conversation on Caribbean biodiversity by illustrating the scientific, policy, and educational relevance of entomological research in Haiti.

It calls for more collaborative, structured efforts to support ecological resilience through evidence-based conservation and the empowerment of local researchers.

Mitochondrial Cytochrome b reveals cryptic diversity in Jamaican *Limia melanogaster* amidst invasive species crisis

Kerri-Ann Bennett¹, Gale Persad¹, Ingo Schlupp²

¹*University of the West Indies, Mona Campus. Mona Road, Kingston 6, Jamaica*

²*The University of Oklahoma, 660 Parrington Oval, Norman, OK 73019, United States*

Invasive alien species (IAS) are a major driver of aquatic species decline and extinction globally. Jamaica is home to four native freshwater fish species, three of which are endemic Poeciliids: *Gambusia wrayi* Regan, 1913, *Gambusia melapleura* Gosse, 1851, and *Limia melanogaster* Günther, 1866. The fourth, *Gambusia puncticulata* Poey, 1854, is native but not endemic. Poeciliids are particularly prone to invasiveness due to life history traits such as live-bearing reproduction, rapid growth, and generalist ecology. Despite their ecological significance, the status, distribution, and biology of Jamaica's endemic freshwater fishes remain poorly understood, hindering effective conservation efforts.

This study examines the distribution of native and non-native poeciliids across Jamaica. Field surveys conducted between June 2018 and April 2025 sampled freshwater habitats using minnow seines (5mm mesh), minnow traps (8mm mesh), and hand nets. Species abundance was recorded at each site, with IAS identified based on the Global Invasive Species Database (GISD 2024). Poeciliids were retained for further analysis, while other species were released. Additionally, mitochondrial cytochrome b sequencing was performed on ten individuals from three *G. melapleura* and five *L. melanogaster* populations.

Results revealed that approximately two-thirds of the 35 surveyed sites harboured at least one non-native species from the family Poeciliidae. The endemic *L. melanogaster* was found in low abundances across most historical habitats. Genetic evidence suggested possible cryptic speciation within *L. melanogaster*. In degraded habitats, IAS often dominated fish assemblages, indicating that habitat degradation and invasive species may jointly threaten native poeciliid survival. These findings underscore the urgent need for targeted conservation strategies to protect Jamaica's endemic freshwater fishes.

Optimisation of growth conditions of the red mangrove *Rhizophora mangle*, an experimental study.

Diana Benuffé, Charlotte Dorville, Frédérique Fardin

Roots of the Sea – Rasin Lanmè association, 97228 Sainte-Luce, Martinique

Mangroves are ecosystems between land and sea that provide multiple ecosystem services. They serve as nurseries, habitats for wildlife, barriers against erosion and waves, filters, and even carbon sinks. These ecosystems are subject to many pressures: anthropogenic, natural and climatic. To support the conservation and resilience of mangroves, the Roots of the Sea Rasin Lanmè association has set up a nursery since 2022 to grow the four main mangrove species found in Martinique: red mangrove (*Rhizophora mangle*), white mangrove (*Laguncularia racemosa*), black mangrove (*Avicennia germinans*) and buttonwood mangrove (*Conocarpus erectus*; achieved in 2024). This nursery is an integral part of the Mangrov bo kay nou project, which has resulted in the planting of 100 mangrove plants in 2024 as part of two restoration initiatives involving local schoolchildren.

This study focused on the red mangrove (*Rhizophora mangle*). A total of 32 propagules were collected from the Anse Désert mangrove (Sainte-Luce) and planted under two substrate conditions: a soil-compost mix (SC) and a soil-compost-sediment mix (SCS), each combined with two types of watering: rainwater and brackish water. The aim was to determine the best growth conditions for *R. mangle*. As a result, at 21 days, a significant difference in growth was observed between the conditions SCS + brackish water (1.8 ± 0.6 cm), SCS + rainwater (2.1 ± 0.8 cm) and SC + rainwater (1.8 ± 0.4 cm), SC + brackish water (1.5 ± 0.6 cm) (Tukey test: p-value = $0.002 < 0.05$). However, no significant difference was found between the two SC conditions regardless of the water type (p-value = $0.7 > 0.05$).

Thus, these results suggest that the inclusion of sediment in the substrate (SCS) creates a more favourable environment for red mangrove growth, probably because it more closely mimics the natural conditions found in mangrove ecosystems. Overall, this study highlights the importance of substrate composition in mangrove nursery practices to improve plant survival and field establishment rates for more effective mangrove restoration in the Caribbean context. It also demonstrates the value of integrating scientific research with community engagement and education for long-term ecosystem conservation.

A regional approach to Lesser Antillean iguana *Iguana delicatissima* conservation: using genetics to inform conservation action

Etienne Bezault^{1*}, Jeanelle Brisbane^{1,2}, Baptiste Angin³, Julien Chalifour⁴, Jenny Daltry^{5,6}, Natalie Duporge⁷, Matt Goetz⁸, Nicolas Paranthéon⁹, Julie Pauwels¹⁰, Karl Questel¹¹, Louise Soanes¹², Jethro van't Hul¹³, Farah Mukhida^{14*}

¹ UMR BOREA, Université des Antilles, Guadeloupe, French West Indies

² WildDominique, Dominica

³ Ardops Environnement, Guadeloupe, French West Indies

⁴ Réserve Naturelle Nationale de St. Martin, St. Martin, French West Indies

⁵ Re:wild, United States

⁶ Fauna & Flora, United Kingdom

⁷ N.DUPORGE E.I., Martinique, French West Indies

⁸ Durrell Wildlife Conservation Trust, Jersey, Channel Islands

⁹ Office National des Forêts, Guadeloupe, French West Indies

¹⁰ J. PAUWELS, E.I., Guadeloupe, French West Indies

¹¹ Agence Territoriale de l'Environnement, St. Barthélemy, French West Indies

¹² Royal Society for the Protection of Birds, United Kingdom

¹³ Saint Eustatius National Parks, St. Eustatius, Dutch West Indies

¹⁴ Anguilla National Trust, Anguilla, British West Indies

The Lesser Antillean Iguana (*Iguana delicatissima*), listed as Critically Endangered on the IUCN Red List, now persists on only six island nations—Anguilla, St. Barthélemy, St. Eustatius, Dominica, Guadeloupe, and Martinique—following its extirpation from over 80% of its historical range. Just five uninhabited offshore islands under 2 km² within these territories continue to support populations in the absence of the invasive *Iguana iguana*. Across its range, the species faces mounting pressures from habitat degradation, invasive predators, poaching, disease, and genetic isolation. Displacement and hybridisation with *I. iguana* pose particularly significant risks, often leading to the rapid loss of native populations. While island-specific conservation efforts have been implemented over the years, ongoing declines underscore the need for a unified, regionally coordinated strategy to ensure the species' long-term survival.

To meet this need, a regional planning meeting held in Dominica in 2022 initiated the drafting of a cross-territory Lesser Antillean Iguana Conservation Action Plan and led to the formation of the Lesser Antillean Iguana Regional Working Group. In 2024, funding from the UK Government's Darwin Plus Initiative enabled the launch of a multi-island project to address two of the plan's highest-priority objectives: (i) to better understand the population genetics of each extant population; and (ii) to establish a framework for the translocation of individuals between islands and territories to enhance genetic diversity and reduce the risk of inbreeding depression, particularly in small and isolated populations. These coordinated actions aim to

strengthen long-term species viability through informed genetic management and regional collaboration.

Central to this effort is the application of Restriction site-Associated DNA sequencing (RAD-seq) to generate high-resolution, genome-wide data from all known *I. delicatissima* populations. RAD-seq offers a significant advantage over microsatellite-based approaches, enabling fine-scale analysis of population structure, hybridisation events with *I. iguana*, and patterns of genetic diversity vital for translocation planning and adaptive management. The resulting data will inform the development of a region-wide genetic management plan and guide conservation actions aligned with the draft action strategy. This integrated approach aims to serve as a replicable model for uniting molecular tools with cross-territory cooperation to safeguard the future of island endemics in an era of accelerating ecological change.

Ecosystem restoration and innovative strategies for protected area management in Grand Bois National Park, Haiti

Anne-Isabelle Bonifassi & Joel C. Timyan

Haiti National Trust, #20, rue Faubert, Port-au-Prince, Haïti

Grand Bois National Park, established in 2015, spans 370 hectares as Haiti's first privately owned forest reserve. It is owned by Société Audubon Haïti and managed by its sister organization, Haiti National Trust (HNT), through a management delegation contract with the Haitian Government. The park lies within the Massif de la Hotte biogeographic area and among the most important biodiversity hotspots in the Caribbean. A 2023 environmental assessment confirmed that the park's primary rainforest habitat remains largely intact, serving as a vital refuge for endemic and threatened species. Notable among these are the critically endangered Southern Haiti Magnolia (*Magnolia ekmanii*), the critically endangered Tiburon Stream Frog (*Eleutherodactylus semipalmatus*), the vulnerable Hispaniolan Freshwater Crab (*Epilobocera haytensis*), the endangered Banded Red-bellied Anole (*Anolis rupinae*), the near-threatened Grey-crowned Palm Tanager (*Phaenicophilus poliocephalus*), a bird species endemic exclusively to Haiti and the vulnerable Hispaniolan parrot (*Amazona ventralis*). Characterized by exceptional biodiversity and rich freshwater resources, the park embodies the ecological importance of conservation efforts. HNT employs innovative, context-specific strategies for protected area management, integrating forest ranger patrols, effective threat mitigation, targeted species conservation, habitat restoration, and an array of community engagement initiatives. Over the past two years, HNT has restored more than 50 hectares of deforested land using native and endemic species while reducing the threat of invasive plant species. This review highlights the achievements of these restoration efforts, ongoing initiatives, and the critical role of community collaboration in safeguarding the park's long-term ecological sustainability.

Eco-epidemiology of West Nile Virus in wild birds in Guadeloupe.

Jeanne Cambron, Sylvie Lecollinet

ASTRE, CIRAD, INRAe, Petit-Bourg, Guadeloupe

West Nile virus (WNV) is a zoonotic vector-borne pathogen, with a wide geographical distribution. It is a growing concern for human and animal health, particularly in the context of climate change, and should mobilize a One Health holistic approach (Geffroy et al, 2021). WNV is maintained and amplified between wild birds and ornithophilic mosquitoes. Clinical infections, more generally West Nile Fever (WNF, with hyperthermia and fatigue) and less frequently West Nile neuro-invasive disease (WNND, such as encephalitis and meningitis) can occasionally occur in mammals, in particular in horses and humans. WNV emerged in North America in New-York city in 1999, causing more than 25000 meningo-encephalitis and 2300 deaths in humans and has spread all over the continent mainly through migratory birds in less than a decade. Despite numerous reports since 2001 confirming the ongoing circulation of WNV in birds, mosquitoes and horses in Latin American and in the Caribbean, no significant human outbreaks have been reported to date in this region. Little information on wild bird and mosquito species involved in WNV epidemiological cycles in the Caribbean is available. Owing to **WNV emergence in Guadeloupe in 2024**, associated with more than 15 horses, 1 wild bird (*Falco sparverius*) and 1 human patient experiencing meningo-encephalitis, we aimed at gaining deeper insight into the eco-epidemiology of West Nile virus in Caribbean tropical regions, in Guadeloupe, and at identifying risk factors of WNV epizootics and epidemics. Since birds are the **main natural reservoir** of the disease and have a large capacity for virus dispersal, studying WNV seroprevalence in resident and migratory birds in areas known to have sustained WNV circulation in 2024 will allow for the identification of WNV bird reservoirs in Guadeloupe and the definition of targeted surveillance protocols and at risk areas for improved anticipation of WNV-emergence risks.

Field investigations were implemented from 10th March to 7th April 2025 in 5 different sites nearby WNV outbreaks, and differing in their landscape architecture (mangrove, tropical rain forest or xerophilic forest). 321 individuals belonging to 18 species were captured in mist nets, identified, sampled and released (Prior authorisations were obtained from a local ethics committee and CRBPO). Oro-pharyngeal swabs and feathers will be analysed by flavivirus and WNV-specific real-time RT-PCR, while blood samples, obtained through venepuncture of the alar vein, will allow to run WNV serology (competition ELISA and confirmatory serological assays). Such analyses are in progress and will be finalized by the end of May.

Our study offers a unique opportunity to collect information on the eco-epidemiology of WNV in Guadeloupe and more widely in the Caribbean, at the heart of a natural hotspot for the emergence of zoonotic, human and animal vector-borne diseases. It will contribute to the identification of resident bird species involved in WNV local epidemiological cycles. It will help

designing targeted surveillance schemes in wild birds and improving the control of WNV outbreaks.

Citizen science takes flight: unveiling 10 years of population trends for two endemic pigeon species across the Caribbean

Christopher Cambrone, Bryan Leborgne, Frank Cézilly

Caribaea Initiative, Le Raizet, Les Abymes, Guadeloupe

The increasing use of citizen science data represents a significant advancement in ecology and conservation, enabling the assessment of animal population trends across broad spatial and temporal scales. Traditionally, demographic trends are estimated through standardized field survey methods, which, although rigorous, require substantial human and financial resources and are consequently spatially and temporally limited.

Free web platforms such as eBird offer a valuable alternative by mobilizing numerous amateur and experienced observers, generating extensive data coverage over large geographic areas. These datasets facilitate early detection of demographic changes and aid in identifying trends at large scales. However, exploiting such citizen science data effectively requires specific statistical methodologies to work with large datasets and correct inherent collection biases.

In the context of the Caribbean, integrating these citizen science data is particularly relevant for game species, for which traditional demographic data are often lacking. Consequently, the use of these datasets can quickly and reliably estimate demographic trends, providing guidance for wildlife management strategies. To this end, we relied on eBird data to estimate demographic trends for two highly valued game bird species: the Scaly-naped Pigeon (*Patagioenas squamosa*) and the White-crowned Pigeon (*P. leucocephala*).

These two highly mobile and erratic species are endemic to the Caribbean region and occupy numerous islands across the Caribbean archipelago, frequently coexisting sympatrically, although favoring distinct habitats. The Scaly-naped Pigeon is primarily a forest-dwelling species, typically inhabiting tropical moist and semi-moist forests, whereas the White-crowned Pigeon prefers coastal habitats, including dry forests, swamp forests, and mangrove ecosystems.

In this oral presentation, we present for the first time demographic trends for these two species across the entire Caribbean archipelago, based on eBird data collected from 2013 to 2023. This unprecedented regional analysis will significantly enhance our understanding of large-scale population dynamics, thus providing an essential tool to inform and guide effective conservation and hunting strategies.

Hunting and conservation in Cuba

Maikel Cañizares Morera

Instituto de Ecología y Sistemática, La Habana, Cuba

In Cuba, hunting activities originated from subsistence hunting practiced by indigenous peoples and colonizers. Over time, hunting became an important recreational activity, and after 1959, citizens had easier access to this sport, leading to a significant increase in the number of hunters, to the point that the organization of Cuban hunters reached over 30,000 members. Initially, hunting did not receive much economic attention in Cuba, and it was not until 1998 that efforts began to manage the natural resources that support hunting exploitation. In developed countries, hunting is generally associated with sporting activities. However, in less resource-rich countries like ours, hunting also encompasses subsistence activities and non-state commercial hunting, which pose significant threats to wildlife species. This paper discusses the current conservation status of wildlife in Cuba and the main causes affecting it, including unsustainable ecosystem management, habitat loss, and the illegal and indiscriminate capture of valuable species. Current Cuban legislation explicitly regulates only the state use of game species, which represent barely 2.0% of the total vertebrates. Nevertheless, there are nearly 100 threatened vertebrate species, primarily due to overhunting. Concrete measures for the sustainable use of wildlife resources are proposed from the perspective of forest inhabitants. Additionally, the scope and effectiveness of existing legislation are reviewed, and an action plan is proposed for implementation. In the current Cuban context, the sustainability of organized hunting is questionable due to the decline of certain game species populations, violations of norms and regulations, lack of management of game species and territories due to funding shortages, inadequate assessments of hunting potential, and improper planning of exploitations resulting from insufficient personnel training and a lack of awareness regarding environmental impacts. Despite these limitations, if managed appropriately, game hunting can be a useful tool for protecting and conserving species and their ecosystems, as it can help maintain the balance of some populations that tend to increase. Furthermore, funds raised from hunting licenses and permits can be allocated to conservation programs, habitat protection, and research.

Incorporating climate change and human pressures in the identification of priority areas for the conservation of two threatened parrot species (birds: Psittaciformes) in Cuba

Maikel Cañizares Morera, Claudia Vega, Carlos A. Mancina

Instituto de Ecología y Sistemática, La Habana, Cuba

Cuba is home to two parrot species: the Cuban Amazon (*Amazona leucocephala*) and the Cuban Parakeet (*Psittacara euops*). Once widespread and abundant, both species have experienced significant population declines and local extinctions, and are now listed as threatened. Given limited conservation resources, it is essential to identify key areas where management efforts can be focused for maximum impact. This study integrates ecological niche modeling with future climate change projections and spatial prioritization analysis to identify critical and resilient areas for the conservation of Cuban psittacines. Presence data from 1995 to 2023 were compiled, resulting in 139 geo-referenced records for the Cuban Amazon and 94 for the Cuban Parakeet after removing duplicates and uncertain records. Species distribution models were developed using Maxent and bioclimatic variables; noncollinearity among predictors was ensured through principal component analysis, and the kuenm package in R was used to optimize model configurations. Climate suitability was assessed using the median projection from three global circulation models (INM-CM5-0, HadGEM3-GC31-LL, and MIROC6). Conservation priority zones were identified using Zonation, which ranks pixels based on their contribution to conservation, emphasizing habitat complementarity and connectivity. To identify areas resilient to climate change, overlapping current and future suitability maps were analyzed, assigning higher conservation value to areas with strong habitat quality and dispersal potential. Both species exhibited high predictive performance and low omission rates. However, projections under climate change scenarios indicate a significant reduction in climatically suitable areas. Spatial prioritization highlighted the Zapata Peninsula and parts of the Guamuhaya and Sagua-Baracoa massifs as the highest-priority areas for the conservation of both species.

Characterization of trace metal elements in mangrove sediments of Guadeloupe

Edlyne Colletin¹, Mélissa Barrast¹, Olivier Gros^{2,3}, Annet M. Laverman⁴, Séverine Ferdinand¹,
Mailie Saint-Hilaire¹

¹*Institut Pasteur Guadeloupe, Morne Jolivière, 97139, Les Abymes, Guadeloupe, France*

²*Institut de Systématique, Evolution, Biodiversité, Muséum National d'Histoire Naturelle,*

³*CNRS, Sorbonne Université, EPHE, Université des Antilles, Pointe-à-Pitre, France*

⁴*CNRS, University Rennes 1, Rennes, France*

Mangroves provide essential ecosystem services, such as shoreline protection, carbon sequestration and biodiversity conservation. However, these ecosystems face increasing threats from anthropogenic activities, particularly pollution from trace metal elements, which tend to accumulate in sediments. In Guadeloupe, there is a lack of available data on trace metal contamination in mangrove sediments. This study aims to assess the concentrations of trace metal elements in sediments from 20 mangroves sites in Guadeloupe. A total of 11

metals (Al, Pb, Cu, Fe, Mn, Zn, Ni, Cd, Cr, As, Hg) were quantified using inductively coupled plasma mass spectrometry (ICP-MS), using a locally developed analytical protocol validated through interlaboratory comparison. The results indicate generally low levels of contamination in mangrove sediments from Guadeloupe. Metal concentrations at nonanthropized sites were consistent with environmental reference values. However, localized pollution and specific hotspots were identified at certain anthropized sites. High concentration of Cu (130 mg/kg dm and 206 mg/kg dm), Zn (775 mg/kg dm) and As (53.8 mg/kg dm) exceeding the N2 reference values (Cu: 90 mg/kg dm, Zn: 552 mg/kg dm and As: 50 mg/kg dm) were detected. Additionally, Hg and Cd were quantified at very low levels and only at one anthropized site. This study updates the available data and provide new data on supplemental sites on metal concentrations in selected mangrove sediments in Guadeloupe. In addition, it has identified specific contamination hotspots that require particular attention and highlights the need for the implementation of continuous monitoring programs to ensure compliance with environmental quality standards.

Acoustic monitoring of Cetaceans in Saint-Pierre Bay, Martinique

Marion Poupard¹, Séréna Laurent¹, Célia Ortolé¹, Céline Valin¹, Morjane Safi¹ and **Benjamin de Montgolfier**^{1,2,3}

¹*Aquasearch design office, Sainte-Luce, Martinique,*

²*Institut des Sciences de la Mer (ISMER), Université du Québec, Rimouski, Canada*

³*Bio – Laurentia, St-Anaclet-de-Lessard, Canada*

Passive acoustic monitoring was conducted in Saint-Pierre Bay, Martinique, between January and May 2024, using two stereophonic hydrophone arrays deployed at depths of 35–40 meters. The objective was to characterize cetacean presence and vocal activity in relation to environmental and anthropogenic factors. Delphinid whistles were the most frequently detected signals, with 384 confirmed occurrences, predominantly during daytime. Their activity appeared to decrease in response to sonar emissions, suggesting a behavioral avoidance mechanism. A significant acoustic event was recorded on May 26, with 39 distinct orca vocalizations, marking the first confirmed acoustic evidence of this species in Martinique. Humpback whales were detected between January and April, with vocal activity peaking at night. Tracking of a migrating individual on February 6 revealed a displacement of 18 km in 2 hours and 20 minutes at an average speed of 8 km/h, exceeding typical migration speeds and potentially indicating an influence of vessel noise. These findings highlight the efficiency of passive acoustic monitoring in cetacean habitat assessment and emphasize the need for long-term studies to evaluate potential impacts of anthropogenic disturbances on marine megafauna in the region.

This study was co-financed by the GPMM (Grand Port Maritime de la Martinique), Aquasearch and the OFB (Office Français de la Biodiversité).

A model species in a model system: how a Caribbean fish is shedding light on threats to freshwater habitats

Amy Deacon

Department of Life Sciences, The University of the West Indies, St Augustine, Trinidad and Tobago

Much of my research revolves around aquatic ecology, invasion biology and patterns of biodiversity. I will start by introducing Trinidad's Northern Range study system and its most famous species – the guppy (*Poecilia reticulata*). This small freshwater fish is native to Trinidad, Tobago and parts of Northern South America, but is an extremely successful invader globally – including on numerous other Caribbean islands. Using examples from work I have conducted both within and outside of Trinidad, I will make a case for how this well-studied little fish can help us understand the ecology of invasive species more broadly. I will also introduce our 15yr fish assemblage dataset from the Northern Range streams. This dataset offers important insights into patterns of biodiversity change over time and is helping to fill what is still a concerning gap in long-term monitoring of tropical freshwater systems.

Identification of areas of endemism in Cuba based on the distribution of amphibians and reptiles

Sergio L. del Castillo Domínguez¹, Roberto Alonso Bosch², Carlos A. Mancina¹

¹*Centro Nacional de Biodiversidad, Instituto de Ecología y Sistemática, La Habana, Cuba*

²*Museum of Natural History "Felipe Poey", Faculty of Biology, University of Havana, La Habana, Cuba*

Among Cuban terrestrial Vertebrates, amphibians and reptiles stand out for their diversity and high levels of endemism. While many species represent local endemisms, others form concentrations in some areas and regions of the archipelago. In this contribution we identified areas of endemism (AEs) in Cuba based on the distribution of 67 amphibians and 136 reptiles species, using 2040 geographic distribution records. Using the software NDM/VNDM version 3.0, AEs were identified from spatial grids with cell sizes of: 0.25°, 0.35°, 0.45°, and 0.55° (where 0.55° equals 55 km). One hundred replicates of each analysis were performed and

species with an endemism index greater than 0.4 were included. For both groups, consensus AEs were identified that were spatially consistent across all scales, which corresponded to the main mountainous regions of the island. For amphibians, four consensus areas were identified at the 0.35°, 0.45° and 0.55° scales with an index of endemism that ranged from 2.25 to 6.37. The Mountains of Sierra del Turquino was the region with the highest value of endemism (> 5.0). For reptiles, five AEs consensus were identified at the 0.55° and 0.45° scales, corresponding to the four main mountain massifs (Guaniguanico mountain range; Guamuhaya mountains; Sierra Maestra mountain range; Nipe-Sagua-Baracoa mountain range), plus the plains and heights of northern HavanaMatanzas. In all scales, the region encompassing the Nipe-Sagua-Baracoa mountain range had the highest endemism index with at least 10 species of reptiles contributing to the scores. In addition, for both groups together, seven AEs consensus were identified at the 0.25°, 0.35° and 0.45° scales and five at 0.55° scale, being Nipe-Sagua-Baracoa mountains the region with the highest value of endemism (> 11.0) from 0.35° to 0.55° scale, but there are also notable at different scales the mountains of Guamuhaya (> 7.0) and Sierra del Turquino (> 6.0). The identification of these AEs can be an important tool for assessing conservation priorities for the biodiversity of Cuban amphibians and reptiles.

An assessment of forest cover change within and outside protected areas in Trinidad

Eleanor S. Devenish-Nelson¹, Neila Bobb-Prescott^{2,3}, Claus-Martin Eckelmann^{4,5}, David Persaud², Howard P. Nelson^{6,7}

¹*Deanery of Biomedical Sciences, University of Edinburgh, UK*

²*Environmental Planning and Policy Division, Ministry of Planning and Development, Government of Trinidad and Tobago, International Waterfront Centre, Port of Spain, Trinidad*

³*Current address: Food and Agricultural Organisation Subregional Office for the Caribbean, Barbados*

⁴*Food and Agricultural Organisation Subregional Office for the Caribbean, Paramaribo, Suriname*

⁵*Current address: Scabiosa Straat 8, Paramaribo*

⁶*Fauna and Flora International, Cambridge, UK*

⁷*Department of Geography, University of Cambridge, UK*

Protected natural areas (PNAs) are central to achieving the targets of the Global Biodiversity Framework (GBF), in particular Target 3. In this context, forest cover dynamics can provide a useful proxy for the management effectiveness of such PNAs. On the Caribbean island of Trinidad, we examined the correlates of forest loss and fragmentation in existing PNAs and assessed the value of a proposed expanded PNAs system for protecting forest cover. Using

Global Forest Watch and high-resolution photogrammetric data as calibration, we estimated total forest cover across the island to be 53% in 2000, with 42% of this total located within PNAs. Using Propensity Score Matching we demonstrated that rates of forest loss were lower within the country's existing PNAs (-0.30%/yr) between 2000 and 2022 than comparable sites outside PNAs (-0.36% /yr). Despite this difference, the overall trend of forest loss both outside and within PNAs was downwards. We found high variability in forest cover between PNAs (66.04% \pm 23.9 in 2000); forest cover within individual PNAs was as low as 21%, which demonstrated that substantial forest loss had already occurred by 2000. However, forest degradation remains a concern within existing PNAs, with 73% experiencing increased fragmentation during the study period. Generalised Linear Mixed Models indicated that proximity to roads and forest plantations and lack of designation as a PNA were significantly correlated with forest loss. The most important correlates of forest loss related to PNA design and management were edge-to-area ratios, legal designation category and presence of extractive industries (petrochemical infrastructure, timber production, quarrying). We found that increases in PNA fragmentation were most strongly associated with higher initial forest cover, human population density/km² and occurred at lower elevations. The combination of decreasing forest cover and increasing fragmentation suggests Trinidad is experiencing a deep degradation stage of fragmentation, where the creation of forest edges is facilitated by deforestation spreading to larger, intact patches, driven by accessibility. The negative impact of anthropogenic activities on forest cover dynamics, often driven by exploitation of deforestation-associated commodities, is evident from our results. Our results indicated that higher-level of protection inherent in designations such as Wildlife Sanctuaries, was more effective than Forest Reserves, suggesting the protective power of limiting anthropogenic activities within these areas. However, a limitation was that we did not include measure of enforcement effectiveness in this analysis and that not all designations were included due to small sample sizes. Our examination of the country's proposed PNA system suggests that the new areas would result in a 17% increase in forest ecosystems within the PNAs system, with a 10.47% overall increase in overall terrestrial PNA area. This increased protection would include some of the most ecologically important sites in the country, which are currently unprotected with low risk of deforestation, particularly high elevation habitat. We emphasise the management and policy opportunities to meet the country's GBF obligations by prioritising the legal designation and implementation of the country's new PNAs system.

Fighting the spread of the Common Iguana: the French West Indies case (2018-2024)

Nathalie Duporge^{1*}, Baptiste Angin², Aude Berger³, Karl Questel⁴

¹ *N.DUPORGE E.I., Martinique*

² *Ardops Environnement, Guadeloupe*

³ *Reserve Naturelle Nationale de St. Martin, St. Martin*

⁴ *Agence Territoriale de l'Environnement, St. Barthélemy*

The French West Indies stretch from North to South of the Lesser Antilles arc. They shelter a rare and specific biodiversity, threatened by the proliferation of Invasive Alien Species such as the Common Iguana. The latter, introduced in different islands by various historical or modern ways, is currently considered as the major threat for the conservation of the Lesser Antillean Iguana (*Iguana delicatissima*). Thus, the situations of colonization of the environment by the common iguana are different for St Barth, SXM, the archipelago of Guadeloupe and Martinique.

We propose here to draw up an overview of the presence of the Common Iguana in these territories and to focus on the different strategies and measures for knowledge and control that are implemented, as well as on the short- and medium-term perspectives for the management of the Common Iguana risk by the stakeholders engaged in conservation networks.

Therefore, we will detail the status of the known Common Iguana populations for each territory, their local and regional situations and impacts on the conservation of the Lesser Antillean Iguana, as well as the frameworks, methodologies and tools for control that are used in each territory. Then, the perspectives and future projects for the management of this IAS in the FWI will be presented.

Variation in avian assemblage composition between contrasted forest habitats in the Sierra de Bahoruco National Park, Dominican Republic.

Lemuel Familia¹, Yolanda León² & Frank Cezilly³.

¹Ayuntamiento de Santo Domingo Este, Dominican Republic

²Grupo Jaragua, Dominican Republic

³Caribaea Initiative, Guadeloupe

The loss of tropical forests is a pressing concern, leading to global restoration efforts to halt their increasing degradation. However, effective restoration programs must go beyond simply increasing vegetation cover and consider ecological indicators of ecosystem health, such as forest birds. This study compared the composition of vegetation and avian assemblages across three forest sites (AB, FI, and PV) in different conservation stages within the Bahoruco Mountain range in the Dominican Republic. Vegetation composition and structure were assessed in 18 plots (6 plots per site), while avian assemblages were recorded in 24 point counts (8 points per site) in winter 2022 and 2023. 74 plant species and 46 bird species were recorded. Similarity

across the sites was low for vegetation across the sites (AB and FI ($J = 0.0896$), AB and PV ($J = 0.0690$), FI and PV ($J = 0$)), while the bird assemblages did not show a significant difference: JABFI = 0.762, JABPV = 0.780, JFIPV = 0.795; $\chi^2 = 0.1287$, $P = 0.9377$. Our data suggests that the site does not significantly influence bird assemblages, but the year does, along with forest structure and composition. Such information will be invaluable for implementing effective restoration actions for the forest and its associated biodiversity.

Molecular and microbial insights into coral reef dynamics: A roadmap for targeted restoration and conservation

Mark A Freeman, Anne AMJ Becker

Center for Conservation Medicine and Ecosystem Health, Ross University School of Veterinary Medicine, St Kitts

Reef-building corals are coevolved symbioses formed by the coral colony, photosynthetic dinoflagellates, and an array of microorganisms (bacteria, fungi, viruses, and protists) collectively referred to as the coral microbiome. Some of these coral-associated microorganisms perform key functions that promote coral health and ecosystem homeostasis and therefore hold considerable potential as monitoring tools, whilst others may have the potential to become harmful when the equilibrium is disrupted during dysbiosis events. The urgency for defining their structure, persistence and dynamics is being driven by reports on rapid coral decline worldwide due to environmental and anthropogenic stressors, and disease outbreaks such as the recent Stony Coral Tissue Loss Disease (SCTLD) epizootic in the Caribbean region.

A long-term study focused on expanding our understanding of coral microbial community dynamics in the symmetrical brain coral *Pseudodiploria strigosa*, an important reef-building species in the Caribbean and highly susceptible to SCTLD, has recently been undertaken in St Kitts. By SCUBA diving on a nearshore rocky reef located at St Kitts, coral tissue/mucus slurries, for DNA extraction and subsequent next generation amplicon sequencing, were collected with blunt sterile syringes from 8 similar sized macroscopically healthy colonies at approximately bi-weekly intervals for a period of one year. Our results provide microbial baseline data for *Pseudodiploria strigosa* and reveal temporal stability and systematic natural variation in coral-specific core bacterial communities across individual hosts. During the one-year study however, SCTLD emerged on the reef, and we identified early microbiome perturbations, which highlights the critical temporal scales and longitudinal baseline analyses required to understand microbial dynamics in the face of a disease outbreak. This underpins the need to increase our understanding of microbial dynamics across different time scales to further

unravel coral disease pathogenesis. Nevertheless, studies tagging and resampling the same healthy colony to record the microbial dynamic stability remain limited. We are currently using the same DNA sample set to evaluate changes in the microeukaryote community structure during the same timeline. Using newly designed PCR primers to simultaneously target the ITS2 region of alveolate taxa (dinoflagellates and apicomplexans) we can evaluate how these beneficial symbionts and potentially harmful parasites respond over time and to a SCTLD disease outbreak.

Such in-water monitoring studies can also help to identify different coral genotypes from important reef-building species that may have different susceptibilities to disease and thermal fluctuations, which can be vital to biobanking efforts and future reef restoration efforts. We present our current analysed data and also discuss the next steps for coral reef research and restoration in St Kitts and Nevis with the aim to generate collaborative partnerships within the region, especially with respect to coral biobanking and reef restoration strategies.

**Unappreciated benthic invertebrates around the French Caribbean
Islands: Brachiopods sampled during the Karubenthos and Madibenthos
Expeditions – Biodiversity, characteristics, ecology**

Danièle Gaspard

*Muséum national d'Histoire naturelle Département Origines et evolution, CNRS-CR2P, Paris,
France*

As part of the program «Tropical Deep-Sea Benthos», two expeditions were organized by the Museum national d'Histoire naturelle (MNHN, Paris) with the oceanographic vessel "L'Antea", the purpose being to emphasize the diversity of the flora and fauna of the French Caribbean islands: Guadeloupe and Martinique. Most of the work remained to be done because the invertebrates of the benthos were poorly known particularly around the islands of Martinique and Guadeloupe.

Among phyla represented, we focus our attention on the brachiopods. Representatives of the phylum exist in the world since the Early Cambrian as benthic marine lophophorates, but while molluscs are well known, it is less the case for brachiopods. The presence of the latter was emphasized much more recently regarding their location in the Caribbean compared to other locations in the world. Representatives of the three subphyla (Linguliformea, Craniiformea and Rhynchonelliformea) of the phylum Brachiopoda were unequally found, the latter being the best represented. Around thirty species were reported (60 - ±700 m for Guadeloupe) shallower around Martinique (11-70 m).

In other respects, brachiopods do not have economic impact (they are reputed to be unpalatable, and some are so small that they can be overlooked). These filter feeder organisms have a bivalved calcite shell with a bilateral symmetry and live attached to various substrates, including corals. If they do not have an economic impact as molluscs have, they nevertheless play a none neglectable role as witness of the local environment.

The two expeditions aimed to observe the biodiversity and contribute to the natural marine heritage of the islands explored. If the brachiopods were not properly mentioned in the purpose of the cruise, however as benthic organisms living attached to the substrate, they precisely record random events, growing in accordance with the seawater temperature in which they live (see our last geochemical analyses performed: (Letulle et al., 2021, 2023), and with food availability.

Preceding these cruises, several ones investigated the Gulf of Mexico including *pr.p.* the Caribbean region (e.g., Cuba), providing an important material among them: the US coastal survey vessel Blake reported by Agassiz (1888), the records of Dall (1871, 1886). In other respects, Crosse (1865), Crosse et Fischer (1866), Cooper (1977) reported the presence of brachiopod species including endemic ones on the lee side or the other costal islands. It is the first occasion we really have to highlight the presence of such brachiopod diversity here, their characteristics, with sometimes a tiny size and coloured ornamentation; moreover, these coloured shells are attached on corals, bryozoans, sponges, but parasitism, and above all, pollution (ecotoxicity: Chloredecone, oil in marinas, Sargasses...) are responsible of their disappearance. Brachiopods appreciate relatively clear waters, but climate changes can intervene in the composition of the fauna. Comparisons with other locations will help to discuss their origin, distribution in the Caribbean Sea and occurrence of some species and their interactions with other bottom faunas.

Intrapopulation dynamic heterogeneity in two sympatric Caribbean cleaner gobies: the effect of microhabitat type and abundance.

Jeniece Germain, Henri Vallès

University of the West Indies Cave Hill. Cave Hill Road, Wanstead, Barbados

Throughout the Caribbean, cleaner gobies *Elacatinus evelyae* (E_eve) and *E. prochilos* (E_pro) can be found inhabiting two microhabitats, live scleractinian corals and the giant barrel sponge (*Xetospongia muta*). In Barbados, E_eve and E_pro prefer corals and barrel sponges, respectively, as each species disproportionately inhabits their preferred microhabitat. They also exhibit different social strategies, whereby E_eve generally occupies corals in mating pairs while E_pro predominantly occurs on sponges in large groups. Based on these differences in microhabitat use, it is expected that the preferred microhabitat would quickly become

saturated following pulses in goby recruitment, resulting in higher rates of negative number-dependence and more stable abundances over time. Conversely, goby populations on non-preferred microhabitat would exhibit higher temporal variability in abundance as (floater) gobies move to the preferred microhabitat as soon as space becomes available, leading to a “buffer” effect. We monitored the abundance of both gobies on 130 barrel sponges (70m²) and 284 corals (32m²) at the same location in Barbados (West Indies) at 4-d intervals over a full year (90 consecutive surveys). Total goby abundance over time varied approximately 5-fold for E_eve and 7-fold for E_pro. For both species, corals exhibited more stable goby abundances and higher rates of negative number-dependence in abundance over time than sponges, which was expected for E_eve but not for E_pro. However, there were important quantitative and qualitative differences between goby species in the effect of number-dependence. First, the fraction of the population that lived on corals (and was thus subject to strong numberdependence) differed strongly between species: 61% of E_eve versus only 8% of E_pro. Second, examination of the size-structure of the coral- and sponge-dwelling populations showed that the largest gobies (super breeders) of E_eve lived on corals whereas the super breeders of E_pro lived on sponges, with corals hosting mainly recruits for this species. Thus, our data supports the existence of a buffer effect for E_eve, whereby the abundance of adult E_eve is strongly regulated by coral availability. For E_pro, however, its preferred microhabitat (sponge) did not appear to be limited due to the higher abundance of sponge microhabitat (twice that of corals) and the ability of adult E_pro to live on sponges in large groups. For E_pro, our data supports the existence of an ontogenetic shift in microhabitat use, moving from corals and small sponges to large sponges as gobies reach maturity.

Though E_eve and E_pro are ecologically similar, our study reveals substantial and complex intrapopulation variability in the dynamics of both species and provides insight into the contrasting mechanisms that potentially contribute to population regulation in these coral reef microhabitat specialists.

Why should you use Conservation Standards adaptive management framework to co-produce, develop, fund and implement your next research or conservation project?

James Goetz

Vermont Center for Ecostudies, USA

Researchers and conservation practitioners who wish to address the current global biodiversity crisis can no longer simply study and monitor species and ecosystems and hope for the best. They must leverage their expertise to confront urgent, complex, high-stakes

environmental problems at every turn. Individuals and teams who wish to achieve long-term impact must work with a range of actors to produce a shared vision, as well as develop, prioritize, implement, monitor, and evaluate their conservation actions. Additionally, they must learn from their success and failure, share those lessons broadly, and somehow find adequate funding for all these activities. Recognizing these diverse demands to achieve effective conservation, as well as the urgency for coherent, effective conservation action, the Conservation Measures Partnership has been working over the past two decades to combine principles and best practices in adaptive, results-based management from conservation and other fields to create the *Open Standards for the Practice of Conservation*, or *Conservation Standards* (CS). These standards bring together in one place common concepts, approaches, and terminology in conservation project design, management, and monitoring to help practitioners to improve their conservation impact. However, far from being a rigid recipe, the CS process is instead a coherent, integrated and flexible set of best practices, as this presentation aims to demonstrate.

CS adoption by donors (e.g. USAID, Walt Disney), government agencies (e.g. Parks Canada, Chile's Environmental Ministry) and non-profit organizations is now widespread, so advanced fluency in the CS is increasingly valuable to enhance collaboration within and across teams and organizations, as well as to increase the success of proposal writing for research and conservation projects. Unfortunately, despite the well-demonstrated benefits of using CS, and broad adoption globally, adoption of CS in the Caribbean has been slow. This is likely in large part of barriers including expensive travel and course fees, language barriers, few course offerings, and competitive access to the courses. VCE has been providing CS training in Latin American and the Caribbean in English, Spanish and Haitian Kreyòl over the past decade, and in a new effort to expand access, has launched online and in-person courses that have provided introductory training to over 100 trainees in the past year. In addition to covering the points above, this presentation will introduce researchers and conservation practitioners to the CS framework, and provide details on self-paced and guided learning opportunities.

Parasitic wasp diversity and implication for sustainable pest management in agro-ecosystems in Guadeloupe

Margot Gumbau¹, Xavier Fauvergue², Jean-Yves Rasplus³, Astrid Cruaud³, Géraldine Groussier², Claire Marteil¹, Sabine Nidelet³, Jean-Marc Blazy¹, Laurent Penet¹

¹INRAE, UR ASTRO, F-97170 Petit-Bourg, Guadeloupe, France

²INRAE, UMR ISA, 06903 Sophia-Antipolis, France

³INRAE UMR CBGP, 34980 Montferrier-sur-Lez, France

In the current context of massive extinction of biodiversity, a major challenge relies in pesticide reduction. Parasitoid wasps are precious auxiliaries in providing natural pest regulations (Wang et al., 2019). Parasitoid females are laying their eggs on or inside pests at different stages (eggs, larvae, adults) and the larval development is killing the host. Understanding the diversity of pests, parasitoid wasps and parasitoid-host interactions is key to promoting effective integrated pest management (IPM) programs.

At adult stage, parasitoid feed with resources such as floral nectar that can be found on flowering plants. These plants also provide refuge and mating sites for parasitoids (Ndakidemi et al., 2022). Therefore, it is essential to maintain and enhance the presence of flowering plants in agro-ecosystems to sustain natural parasitoid populations (i.e., conservation biological control). While this concept has been extensively studied worldwide, it remains largely underexplored in Guadeloupe and, more broadly, in tropical contexts.

During a three-year Ph.D research program, more than 10,000 parasitoids were sampled and identified. These belong to over 20 families within 7 superfamilies. This work has led to the first recorded presence of some of these families in Guadeloupe. Here we propose to 1) present the diversity of parasitoid wasps found in Guadeloupe 2) discuss about their implications for sustainable pest management, and 3) explore strategies for enhancing pest biological control by conserving and promoting this natural diversity of parasitoid wasps.

The hidden library of knowledge within biodiversity

Reia Guppy

The University of Trinidad and Tobago, Trinidad

When we think of information and places to acquire knowledge, libraries and academic institutions tend to come to mind, with organized systems or categories such as the Dewey Decimal system or the Library of Congress. In recent times, indigenous knowledge is also highlighted as a valuable source of information and knowledge, passed down several generations. Indigenous knowledge can predate that found within libraries and books. Much of this source of knowledge is developed from deep rooted relationships with the natural world. Such is really a reflection of the learned knowledge hidden within nature. Here, we present some of the more obscure knowledge bases offered within the natural environment. Understanding the biodiversity 'system', incorporates looking beyond observing the physical, chemical and biological state. Here we offer insight into the library of knowledge hidden within skeletal and cellular structures, genes to ecosystems, chemical compounds, bioacoustics, biogeography, engineering, and more.

Nemertean egg-predators of the Caribbean Spiny lobster – A regional issue?

Nicole A M Herbert^{1,2}, Mark A Freeman¹

¹ *Ross University School of Veterinary Medicine, Center for Conservation Medicine and Ecosystem Health, Saint Kitts*

² *Caribaea Initiative, 37 rue Jean Jaurès, Le Raizet, 97139 Les Abymes, Guadeloupe*

The Caribbean spiny lobster, *Panulirus argus*, generates almost 1 billion US dollars annually throughout territories of the Gulf of Mexico, the Caribbean Sea and the western Atlantic Ocean. Although several management strategies are adopted throughout the region, it has been reported that lobster populations are declining.

To date, there are few known diseases and parasites of *P. argus*. The most notable of these is Panulirus argus virus 1 (PaV1), discovered over twenty years ago in Florida. This virus is lethal in juveniles and has been reported in several territories except the eastern and southern Caribbean countries.

A nemertean egg-predator, *Carcinonemertes conanobrieni*, was reported in Florida (7.4% prevalence) in 2017 during a study on *P. argus* fecundity and parental care. This nemertean was also discovered in Colombia in 2018. Evidence of nemertean infestation was detected in 87% egg-bearing females in Saint Kitts and Nevis. Upon molecular analyses, we discovered two *Carcinonemertes* spp. – *C. conanobrieni* and an undescribed species. The undescribed *Carcinonemertes* sp. was found in the gills of 23% male and female lobsters. Most recently, *C. conanobrieni* was found in the egg masses of *P. argus* in Panama (47.37% prevalence) and Costa Rica (64.71% prevalence).

The presence of *Carcinonemertes* spp. in this economically important *P. argus* in southern, eastern and northern locations within the range is cause for concern. Historically, members of the *Carcinonemertes* genus have caused the collapse of the fishery of crabs in California and Alaska. We will discuss some assumptions regarding the geographical range of the parasite. We will also discuss implication of its presence and prevalence and possible impact on lobster populations.

Combining citizen science and camera traps to study population trends and habitat selection of the Bridled Quail Dove, *Geotrygon mystacea*

Bryan Leborgne^{1,2}, Frank Cézilly¹, Christopher Cambrone¹

¹*Caribaea Initiative, La Raizet, Les Abymes, Guadeloupe*

²*Faculté des Sciences, Aix Marseille Université, France*

The Bridled Quail Dove is endemic to the insular Caribbean, being present from Puerto Rico and the Virgin Islands to the Lesser Antilles, apart from Anguilla, Saint Vincent and the Grenadines, Grenada and Barbados. Although the species is currently listed as Least Concern in the IUCN red list, global population is thought to be decreasing, possibly due to habitat loss, extreme climatic events, hunting pressure and predation by exotic mammals. However, limited information exists on population trends, habitat selection and potential competition with the congeneric Ruddy Quail Dove, *G. montana*, on some islands. Here, we present new and original data on population trends and habitat selection in the Bridled Quail-Dove based on the analysis of data from e-bird over the species' distribution range and a camera-trap survey recently conducted in Guadeloupe and Martinique. We particularly compare the results obtained with two methods to assess the local and regional population dynamics of the species.

The use of detection dogs in conservation: the example of a scat detection dog in the CIMBA project

Sarah Lionnet, Yuna Melane, Frank Cezilly, Christopher Cambrone

Caribaea Initiative, La Raizet, Les Abymes, Guadeloupe

Dogs' remarkable olfactory abilities, combined with their relative ease of training, have long been recognized in various fields such as drug detection and search-and-rescue operations. More recently, these abilities have been increasingly applied in wildlife conservation. Detection dogs are now widely used for monitoring rare or cryptic species, studying predator-prey interactions, and conducting biodiversity assessments. Their capacity to detect elusive species or biological material such as scat, carcasses, or nests offers a noninvasive and efficient alternative to traditional methods, which are often considered intrusive. Moreover, detection dogs can significantly improve sampling efficiency and spatial coverage compared to human efforts alone. However, several factors can influence their effectiveness, including environmental conditions (e.g., temperature, humidity) and search design, both of which can impact olfactory performance. Additionally, the time and resources required for training dogs and handlers are not negligible in terms of cost and effort. Despite these considerations, the overall cost-benefit balance remains favorable, particularly when targeting rare, elusive, or cryptic species and their biological traces. In this context, detection dogs can play a crucial role in the detection, monitoring, and management of invasive alien species. This is why Caribaea Initiative has launched a new project, CIMBA (Controlling the Impact of Exotic Mammals on Biodiversity in the Antilles), supported by the Interreg program. The project aims to assess and mitigate the impact of exotic mammalian predators such as mongooses, rats, and feral cats and dogs in Guadeloupe, Haiti, and the Dominican Republic. As part of this effort, the diet of

these species will be analyzed through fecal and stomach content samples to identify prey species and provide quantitative evidence of their ecological impact. Non-invasive fecal sampling will be conducted in natural habitats with the help of detection dogs, especially for domestic species that cannot be euthanized as easily as other invasive alien species. This presentation offers a literature review on the use of detection dogs as an innovative tool for wildlife conservation research and management. While their application in conservation is still relatively new in the Caribbean Islands, our project contributes to a growing body of research demonstrating the effectiveness of detection dogs for wildlife monitoring— particularly in tropical ecosystems where data collection is often especially challenging.

Reef decline and benthic dynamics in Martinique: Contrasted trajectories and ecological transitions. The need for a coral reef ecology laboratory.

Maréchal Jean-Philippe, Gros-Désormeaux Jean-Raphaël

CNRS UMR 8053 – PHEEAC - Université des Antilles, Martinique

In the face of increasing anthropogenic pressures and recurring climatic disturbances, coral reefs in Martinique are exhibiting divergent ecological trajectories depending on their location. Based on standardized time-series monitoring conducted at five representative sites since 2001, this study describes the benthic dynamics and regime shifts observed through 2025.

Multivariate analyses of benthic community structures reveal significant spatial heterogeneity, with sites clustering into distinct groups based on their benthic composition. In 2025, reef communities are primarily structured by four key variables: macroalgae, turf algae, scleractinian corals, and bare substrate. Macroalgae currently dominate most sites, exceeding 50% cover at Pointe Borgnesse, Fond Boucher, and Jardin Tropical.

A diachronic analysis highlights a widespread decline in live coral cover—often below 5%—except at Îlet à Rats, the only site showing relative stability and sustained coral presence. Cases of shifts to degraded stable states were identified, particularly at Caye d’Olbian and Jardin Tropical, marked by the collapse of herbivorous urchin populations (*Diadema antillarum*) and the loss of benthic rugosity. The 2024 passage of Tropical Storm Beryl further exacerbated this decline by flattening structurally complex reef areas.

A percentile-based assessment applied to key structural variables quantified deviations from initial baseline conditions, confirming the crossing of critical ecological thresholds at four of the five sites. These findings suggest that the natural resilience of these systems is now impaired and that targeted restoration efforts are urgently needed to halt degradation and safeguard essential ecosystem functions.

To address these urgent challenges, a permanent Coral Reef Ecology Laboratory will be established by June 2025 in Martinique. This laboratory is the result of a strategic collaboration between the GPMLM (Grand Port Maritime de la Martinique) and the CNRS (French National Centre for Scientific Research). It will provide a platform for applied ecological research, coral cultivation, and the development of science-based strategies for reef restoration, monitoring, and resilience-building. The lab aims to serve as a regional hub for knowledge transfer, innovation, and collaborative responses to the ongoing decline of coral reef ecosystems in the Caribbean.

Using camera traps to assess the abundance and the distribution of invasive mammals in Guadeloupe

Yuna Mélane¹ and Christopher Cambrone²

¹*Université des Antilles, 97154 Pointe-à-Pitre, Guadeloupe*

²*Caribaea Initiative, Le Raizet Les Abymes, Guadeloupe*

Island ecosystems are facing numerous threats, among which biological invasions stand out as a major concern. Invasive species impact biodiversity in various ways, including competition, predation, hybridization, and the transmission of diseases and parasites. Besides, free-ranging or feral domestic species can exert similar pressures on native ecosystems, further amplifying ecological impact. Beyond these ecological consequences, invasive and feral species also induce significant economic losses, both through damage to agriculture and the costs associated with their control or eradication. These ecological issues are particularly significant in the Caribbean islands, where all islands are impacted by at least one invasive species.

In the French West Indies, several invasive and feral species have become common across various habitats. However, their exact impacts on native ecosystems and their spatial distribution remain poorly documented. To address these gaps, a recent project led by Caribaea Initiative (CIMBA - Controlling the Impact of Exotic Mammals on Biodiversity in the Antilles), supported by the Interreg program, aims at studying exotic predatory mammals in the Caribbean region. Studied species includes the domestic cat (*Felis catus*), originally introduced as a pet, the small Indian mongoose (*Herpestes auropunctatus*), introduced to control rat populations, and now, is one of the most invasive species in the Caribbean, and the raccoon (*Procyon lotor minor*), introduced in the early 19th century.

As part of this project, a Ph.D. project is investigating the spatial distribution and the impact of these species on native biodiversity in Guadeloupe and Martinique. Potential health issues associated with these species will also be considered. In this presentation, we share preliminary findings on the abundance and distribution of cats, mongooses, and raccoons in Guadeloupe, based on an extensive camera trap survey. These passive survey devices were

deployed across both natural and semi-urban environments. Our statistical analyses estimate the relative abundance of each species and their spatial and temporal cooccurrence patterns. The co-occurrence with ground-dwelling bird species, which could prey on studied exotic and invasive species, is also examined.

Pathways to sustainable hunting in the insular Caribbean

Howard P. Nelson

*Fauna & Flora International/ University of Cambridge, David Attenborough Building,
Cambridge U.K.*

Caribbean people have deep utilitarian and relational values with nature on these islands. A key dimension of this relationship is the use of nature by local people, including through hunting. Whether as for pets, meat, recreation or cultural heritage, the region's diverse human communities have and continue to express a strong relationship with many marine, coastal and terrestrial species, which in some cases are arguably the primary force driving the abundance of these species on the landscape today. In this talk, I explore the challenges and opportunities facing stakeholders involved in exploiting and managing hunted terrestrial species and their habitats. Drawing on my experience of studying exploited mammal and bird populations on Trinidad and Grenada, as well as my work on public attitudes to nature and environmental policymaking on these islands, I will share my insights on the intersecting challenges of limited human and financial resources and technical capacity, weak stakeholder engagement, weak intra-regional cooperation on migratory species, accelerating climate change and habitat change and fragmentation. With countries in the region having committed to the CBD's Global Biodiversity Framework, the scale of the challenge posed by Targets 5 and 9 on sustainable harvesting of biodiversity that also benefits people, requires a step-change in our realization of sustainable hunting in the Caribbean. In this presentation I point to some systems-level levers that may facilitate this transformation.

Intraspecific and spatial variation in habitat use by sperm whales (*Physeter macrocephalus*) along the west coast of Martinique

Marion Poupard¹, Séréna Laurent¹, Célia Ortolé¹, Morjane Safi¹, and Benjamin de Montgolfier^{1,2,3}

¹*Aquasearch design office, ZAC Les Coteaux 97228 Sainte-Luce, Martinique*

²*Institut des Sciences de la Mer (ISMER), Université du Québec, Rimouski (UQAR), Canada*

³*Bio – Laurentia, St-Anaclet-de-Lessard, Canada*

For deep-diving cetaceans like sperm whales (*Physeter macrocephalus*), acoustics is a crucial tool for studying distribution and habitat use. This is particularly relevant in the eastern Caribbean, where intense maritime traffic leads to noise pollution and an increased risk of vessel collisions. Understanding how these whales use their habitat is essential for effective conservation strategies.

In this study, we investigated intraspecific variations in distribution and habitat use along the Caribbean coast of Martinique. Over 24 surveys, we recorded 19 aggregations comprising a total of 72 individual sightings, acknowledging potential resightings of the same individuals. By analyzing the Inter-Pulse Interval (IPI) of echolocation clicks, we estimated individual sizes, providing insights into age and sex composition. Habitat characteristics such as bathymetry, distance from the coast, and seabed slope were also assessed.

Our findings on social structure align with previous studies: 37% of observed aggregations consisted of females and/or juveniles, often with a mature male nearby. Temporal changes in group composition reflected male migration patterns. Spatial distribution and habitat use remained consistent across aggregation types, regardless of group size, individual size, or the presence of immatures. However, specific areas were identified for feeding and socializing, primarily influenced by bathymetry and distance from the coast. Interestingly, seabed slope appeared to have no significant impact, suggesting either a limitation in our spatial scale or the need for more detailed seabed characterizations.

These results underscore the importance of habitat features and temporal dynamics, particularly in relation to environmental conditions and the movement of breeding males. By refining our understanding of sperm whale distribution in the region, this study contributes valuable insights for traffic management strategies aimed at mitigating collision risks with vessels.

This study was co-financed by the GPM (Grand Port Maritime de la Martinique), Aquasearch and the OFB (Office Français de la Biodiversité).

Monitoring harvested populations

Roger Pradel

CEFE, Univ Montpellier, CNRS, EPHE, IRD, Montpellier, France

Ideally, harvest should remove exactly the excess production each year so as to maintain the population indefinitely. This supposes to monitor the population over time in a reliable manner. In particular, the monitoring should be systematic and consistent (same protocol). Counts, distance sampling, use of camera traps for example would yield year after year indices of the relative population abundance: if the population appears to be increasing (decreasing),

the bag limit may then be increased (lowered). However, more informed measures, such as targeting specific segments of the population or setting appropriate hunting periods, require a deeper understanding of the population dynamics. Then, other methods that allow to estimate population parameters (sex- and age-specific survival, reproductive success...) should be used. Capture-recapture protocols provide for instance information at the individual level allowing to study individual heterogeneity in breeding success, the role of breeding experience... With refined information, population models can be constructed and used to investigate management scenarios.

From the Sky to the Sea: Emerging technologies in the observation and monitoring of aquatic organisms health, distribution and behavior

Guillaume Rieucou

Louisiana Universities Marine Consortium, Chauvin, Louisiana, USA

Many marine animals face escalating threats from human activities and environmental disturbances and modifications, emphasizing the critical and urgent need for the development of innovative and non-invasive research methods to study and protect them. This is particularly true in estuarine and coastal systems known to display rapid variations in hydrodynamic properties. In many instances the acquisition of behavioral information becomes challenging to obtain due to the limitation of many sampling gears that lack adequate spatial or temporal resolution, or potentially alter behaviors. In this presentation, I will present novel technological approaches recently used to enhance the observation and monitoring of aquatic organism health, distribution and behavior. In particular, I will focus on two emerging non-intrusive methods: high-resolution imaging sonar and unoccupied aerial vehicles (drones). With regards to high-resolution imaging sonar, I will present recent technological advancements permitting the study of behaviors in situ and discuss applications of imaging sonar among a meta-analysis of aquatic organisms in their environments. A particular focus will be given to the performance of imaging sonar for studying inter- and intra-specific interactions, associations with complex habitats and low-visibility environments. I will examine the data processing and analytical methods used to extract behavioral metrics and introduce of work-flow for automating abundance estimates and image classification with the goal of providing a resource for researchers. Drone technology (including aerial, surface, and underwater vehicles) has revolutionized marine science research by providing novel avenues for data collection. I will present it applications in the field of marine mammal sciences and explore its use for the study of population abundance and distribution, behavioral studies, and health assessemnt using drone-based photogrammetry and blow sampling. Future directions for the integration of artificial intelligence and machine learning to improve automated

detection and long-term monitoring will be also presented. Overall, this presentation will highlight the transformative impact of emerging technology on marine animal research and conservation.

Understanding the Greater Caribbean manatees in Puerto Rico: Enhancing conservation strategies through the use of veterinary pathology and parasitology

Carla I. Rivera-Pérez,^{1,2} Antonio A. Mignucci-Giannoni,^{1,2} Mark A. Freeman,¹ and Michelle M. Dennis^{1,3}

¹ *Conservation Medicine and Ecosystem Health, Ross University School of Veterinary Medicine, Basseterre, St. Kitts*

² *Caribbean Manatee Conservation Center, Inter American University of Puerto Rico, Bayamón, Puerto Rico*

³ *Department of Biomedical and Diagnostic Sciences, University of Tennessee College of Veterinary Medicine, Knoxville, Tennessee, USA*

The Greater Caribbean manatee (*Trichechus manatus manatus*) is a subspecies of the American manatee (*T. manatus*) that is endangered in Puerto Rico and other Caribbean countries. This aquatic giant plays an essential role in marine environments, acting as a sentinel of coastal health while significantly contributing to regulating seagrass bed growth. However, manatee populations are often subjected to numerous threats, as evidenced by the stranding events across different countries of distribution, where individuals are found alive but injured, ill, or dead. A comprehensive study analyzing 23 years of data (1999-2022) delves into the causes of manatee mortality in Puerto Rico, utilizing strandings reports, veterinary records, and postmortem examinations, including histological and statistical analyses. The research evaluates various factors such as stages of decomposition, age, sex, and seasonal variations, identifying distinct threats specific to the Greater Caribbean manatee, including infectious and non-infectious diseases, emerging zoonotic threats, and anthropogenic impacts like trauma from watercraft collisions. In addition to exploring mortality causes, this study introduces the use of endoparasites as a biological tag for manatee populations, specifically with the nasal trematode *Pulmonicola cochleotrema*. This research is significant as it marks an investigation into leveraging parasites to better understand host-parasite relationships and the distribution of manatees. Endoparasite samples were collected from manatee carcasses that had stranded ashore in Puerto Rico and Florida, specifically focusing on the genetics of the nasal trematode. Evidence of genetic variability between manatee populations and individual hosts was found through molecular techniques such as polymerase chain reaction (PCR) for amplifying ribosomal DNA (rDNA) fragments. The molecular analysis reveals consistent nucleotide changes among different rDNA sequences, indicating potential differentiation between

subspecies or even among individuals within the same population. By amalgamating findings from both study areas, a view highlighting the interconnectedness of environmental health, wildlife management, and public health emerges. Identifying the nasal trematode as a biological tag offers a novel tool for conservationists and researchers working with this species, potentially aiding in tracking manatee populations and their relation to broader ecological dynamics. Moreover, the challenges facing the manatee and the underlying data deficiencies in conservation efforts signify the need for a collaborative approach, emphasizing data sharing and joint conservation management strategies among Caribbean countries experiencing similar issues. Utilizing a comprehensive One Health approach—integrating wildlife, ecosystem, and human health—can significantly enhance our capacity to mitigate diseases that threaten manatees and public health. Collectively, these research endeavors advocate for more robust conservation initiatives to safeguard the future of the Greater Caribbean manatee and ensure the sustainability of their marine environments. By fostering new strategies and promoting knowledge exchange, there is potential for a rejuvenated commitment to the conservation of this endangered species, ultimately securing their survival for future generations.

The conservation status of native monkey species in Trinidad, W.I.

Luke Rostant¹; Darshanjit Narang²

¹*Department of Life Sciences, Faculty of Science and Technology, The University of the West Indies, St. Augustine Campus, Trinidad*

²*Tunapuna, Trinidad and Tobago*

Trinidad W.I. is home to two species of native monkey; the Howler Monkey, *Alouatta insulanus*, and the Trinidad White-fronted Capuchin, *Cebus trinitatis*. Both species are important ecologically as the former aids in regulating plant growth and seed dispersal, while the latter aids in seed dispersal and insect and small vertebrate population control. They are also hold great cultural significance to the people of Trinidad and Tobago. In spite of their importance, both species have been recently designated nationally as environmentally sensitive species, with the Howler Monkey recently being assessed as a unique species and the Trinidad White-fronted Capuchin as a critically endangered species by the IUCN. Due to these designations, and due to the lack of information on the population status of both species, recent transect field surveys have been carried out to assess the population densities of these species throughout the island in Trinidad and develop management plans for their future conservation. In surveys conducted in the Trinity Hills and Bush-Bush wildlife sanctuaries in 1994, Howler Monkey had estimated densities between 11 to 83 individuals/km², while those of White-fronted Capuchin were estimated at 7 to 27 individuals/km². More recent surveys throughout Trinidad are based on transect surveys of

over 1400 km and estimate densities of Howler Monkey throughout the island from 5.3 to 115 individuals/km², while those of White-fronted Capuchin were found to be about 7 individuals/km². This presentation will focus on the ecology of these species and will review past work on the species in terms of population estimates in Trinidad and compare these to more recent estimates. The presentation will also highlight the primary threats faced by both species, identify gaps in our knowledge on them, and highlight short, medium, and long term conservation goals with accompanying projects.

Unearthing soil invertebrate diversity in Barbados

Isabella Serrette¹, Brian Leung¹, Kristin Saltonstall²

¹*McGill University, Montreal, Canada*

²*Smithsonian Tropical Research Institute, Panama, Republic of Panama*

Soil invertebrates encompass a wide range of species with incredible taxonomical and morphological diversity and play active roles in many of the ecosystem services that soils provide. In many cases, their distributions and diversity can be heavily influenced by environmental factors such as soil type, aboveground plant cover and human land use practices. However, soil faunal diversity has rarely been studied in the Caribbean, and data on their distributions within the region is limited. Meanwhile, many countries in the Caribbean have a history of extensive land use changes and a high incidence of modified environments, both of which have implications for the diversity and distributions of soil invertebrates.

This study will investigate the distributions of soil invertebrate alpha and beta diversity in Barbados, using soil eDNA to collect presence/absence data at sites across the island. Additionally, the relationships between soil faunal diversity and selected environmental factors will be explored using remote-sensing data.

Ultimately, this research will begin to address the gap that exists in knowledge of soil faunal diversities in the Caribbean and build on existing knowledge of soil invertebrates' relationships with their environments.

Potential impact of the invasive Puerto Rican anole on body size and demography of the Dominican anole

Jeanelle Birsbane¹, Norma Antony¹, Ira Pierre¹ and **Annabelle Vidal**^{2, 3}

¹ *Forestry, Wildlife and Parks Division, Roseau, Dominica*

² *Caribaea Initiative, Le Raizet, Les Abymes, Guadeloupe*

Invasive species can have detrimental effects on local biodiversity, often outcompeting native species for resources, altering habitats, or introducing diseases. In Dominica, the Dominican anole, *Anolis oculatus*, is the sole native anole species, playing a crucial role in the island's ecosystem. However, the accidental introduction of the Puerto Rican anole, *Anolis cristatellus*, has raised concerns about potential ecological disruptions. This study aimed to assess the impact of the invasive Puerto Rican anole on the native Dominican anole by comparing populations where both species coexist (sympatric) with populations where only the native species is present (allopatric). The study design involved two sympatric sites and two allopatric sites. Data on body size (snout-vent length) and sex were collected on 611 individuals, captured and marked during a six-month survey. The results revealed no significant differences between sympatric and allopatric populations in terms of sex ratio (balanced), recapture rate, and female body size, suggesting that these traits were unaffected by the invasion. However, males in sympatric populations were significantly larger compared to males in allopatric populations, resulting in a more pronounced sexual size dimorphism. These findings indicate that the invasive Puerto Rican anole may be influencing the native species' morphology, at least in males, possibly due to sex-related competition. The lack of effects on other traits, such as female size or population demographics, suggests that the invasion may still be in its early stages (the presence of the Puerto Rican anole was reported in 2012), with more pronounced impacts potentially emerging over time. Alternative hypotheses, such as pre-existing environmental differences between sites or clinal variation between populations of the native species, could also explain the observed patterns. In conclusion, while the invasive Puerto Rican anole appears to have a moderate effect on the native Dominican anole—primarily influencing male body size—further research is needed to determine whether these changes will intensify as the invasion progresses or if other ecological factors are at play. These findings underscore the importance of monitoring invasive species to mitigate long-term impacts on native biodiversity.

Killing for conservation: Reconciling hunting with biodiversity agendas

Erica von Essen

Stockholm Resilience Center, Stockholm University, Sweden

Hunters have a public relations problem. Once seen primarily as exploiters of wildlife, many now seek to reposition themselves as stewards of nature. Yet this transformation is complicated by the persistence of negative associations—illegal wildlife trade, opposition to large carnivore conservation, and the enduring image of the trophy hunter. At the same time,

contemporary conservation agendas are assigning hunters *new* roles that stretch and sometimes clash with their traditional identities. Today, hunters are called upon to act as de facto garbage collectors, managing “unwanted” wildlife; as citizen scientists, logging ecological observations; and as frontline agents of biosecurity, controlling invasive species or potential disease vectors. In so doing, they edge closer to conservation work.

This talk explores the increasingly entangled mandates of hunters and conservationists. What kinds of friction arise when these roles overlap? And where might common ground be found, either in ethical outlooks or in practical interventions? Moving beyond self-ascribed hunter narratives of care and custodianship, I examine some current real-world cases that complicate the relationship: collaborations on invasive species removal, the use of trophy hunting to fund conservation, wildlife culling to mitigate human-wildlife conflict, and emerging tensions between hunting and rewilding or other nature-based solutions.

My talk will highlight both the ethical fault lines and the overlooked synergies between hunting practices and conservation objectives at different locales with distinct biodiversity challenges—cities, agriculture, island nature. By unpacking these dynamics, the talk aims to stimulate a more nuanced understanding of how hunters might fit—or fail to fit—into the future of biodiversity governance.

Bring local nature education to everyone with books

Jenn Yerkes, Mark Yokoyama

Les Fruits de Mer, Saint-Martin

Every child in the Caribbean has the right to learn about their island and its unique nature, heritage and culture. Kids who learn about these important topics become adults who care about them. But how can small organizations with limited resources reach an entire population in a meaningful, lasting and ongoing way? And how can you have a great education program without constantly pulling resources from research and conservation? One answer is books. Books are tangible and children can engage with them for hours. Once a book is created, it can be reproduced infinitely. This makes it possible for a small organization to reach hundreds, thousands, tens of thousands of children or more. Digital technology makes it possible to create beautiful, engaging books for a specific island and print them as needed. The Les Fruits de Mer association will present an overview of their book program, which reaches every single child in school on the island of St. Martin, from preschool through secondary school. This transboundary program produces multilingual books for all ages about the nature, heritage and culture of St. Martin. The presenters will share the results of this program and the benefits for students, communities and the organizations developing these materials. They will outline the technologies and techniques that make it possible to implement this type of program on

any island, and the key attributes of a successful program. By working together, researchers, conservationists and educators have a pathway to create lasting change on every island in the Caribbean by reaching every child in the region. In the long term, this can transform perceptions of nature and attitudes towards conservation, while also building pride in natural and cultural heritage and general skills that contribute to educational and career success.

Posters

Evaluating the effectiveness of passive acoustic monitoring at detecting anurans in Caribbean tropical forests

Renoir J. Auguste¹, Amy E. Deacon², & Mark F. Hulme³

Department of Life Sciences, The University of the West Indies, Saint Augustine, Trinidad and Tobago

Passive acoustic monitoring (PAM) has emerged as an innovative technique that can be used to monitor biodiversity. Yet, the global distribution of its application is uneven, and few studies have evaluated its effectiveness for amphibians. Given the pressing need to improve conservation actions for this taxon, recommending efficient ways to monitor species is urgently needed. We aimed to evaluate the effectiveness of PAM by comparing the number of species detected to those detected with the traditional method of visual encounter surveys (VES) in Caribbean tropical forests. We set out to use our findings to develop much-needed recommendations to guide monitoring and inform management for amphibians in the region. From five fixed tropical forest sites sampled across Trinidad and Tobago, we found that PAM detected 16 species, more than twice as many species as VES at 6 species. Using the Chao2 species richness estimator, PAM (16.4, SE 0.95) was also more comprehensive than VES (9.2, SE 4.31). Using a pattern matching algorithm, no new species were detected from PAM after the first week of sampling in July within our fixed sample sites, which suggests this could be a key survey period to focus monitoring efforts. Effort in terms of time collecting data was similar between the two methods, totalling 1500 minutes evaluated across all five sites; PAM involved more analysis time in processing the sound files, yet required fewer field visits and resulted in greater community completeness. Where resources permit, we recommend that PAM be used to survey amphibians in Caribbean forests, and that sampling should be concentrated during the first two months of the rainy season to monitor communities optimally.

Impact of the 2023 bleaching event on corals of Martinique, French West Indies

M. Bon¹, M. Kayal², C.R. Dromard³ and C. Desrosiers¹

¹*Impact Mer, Martinique*

²*ENTROPIE, IRD, New Caledonia*

³*BOREA, University of the French Antilles, Guadeloupe*

Coral bleaching poses a growing threat to coral reef ecosystems, with the 2005 event causing a 11–30% coral cover loss in the French West Indies. In 2023, sea surface temperatures (SST)

in the Windward Caribbean Islands exceeded the bleaching threshold from late July to midNovember. This study assessed the impact of this event at twelve coral reef sites around Martinique, monitored annually under the European Water Framework Directive. Surveys were conducted at the peak of bleaching (October 2023) and four months later (February 2024), following IFRECOR protocols. Coral colonies were identified to species level and categorized as Healthy, Pale, Bleached, Recently Dead, or Previously Dead. Results show that 81% of coral cover was affected, with a 34% loss. Bleaching intensity varied across sites, with six sites showing significant coral mortality—particularly those dominated by *Madracis auretenra*, *Porites porites*, and *Acropora palmata*. *Millepora* spp. and *M. auretenra* showed high mortality rates (39% and 23%, respectively), whereas *Pseudodiploria strigosa* showed no mortality. Other benthic organisms, such as *Erythropodium caribaeorum* and *Palythoa caribaeorum*, were also impacted. This unprecedented bleaching event likely resulted from prolonged thermal stress and compounded the effects of previous disturbances, including Stony Coral Tissue Loss Disease (SCTLD) and sea urchin die-offs. Coral loss varied by site, potentially due to differences in species composition and thermal exposure. Continued monitoring is ongoing, but urgent global climate action and improved local management are essential to support coral reef resilience and recovery.

In situ conservation of the critically endangered palm *Attalea crassispatha* in Southern Haiti: Seed collection, community engagement, and germination strategies

Anne-Isabelle Bonifassi, Joel C. Timyan & Alex Domerçant

Haiti National Trust, #20, rue Faubert, Port-au-Prince, Haïti

With only 24 individuals identified in the wild as of 2017, *Attalea crassispatha* (Mart.) Burret (Arecaceae), a critically endangered palm endemic to southern Haiti, represents a key species for palm conservation within the Caribbean Island Biodiversity Hotspot as the sole member of its genus, comprised of 30 species, found in the region. In 2024, a comprehensive in situ conservation initiative was launched by Haiti National Trust to avert its extinction. This ongoing project focuses on community engagement, seed collection, nursery propagation, and collaboration with local stakeholders to ensure the species' survival. During the first year of the project, 843 seeds were collected from 16 georeferenced sites, and experimental protocols were implemented to optimize germination, achieving a germination rate of 5% within 2 months. At the same time as the seed collection, awareness and educational campaigns were conducted across local communities, engaging over 75 individuals and fostering active participation in conservation efforts. These activities lay a robust foundation for the reintroduction of *Attalea crassispatha* into its native habitat and mark a critical step toward improving its conservation status.

Citizen science reveals the invasion of the Bare-eyed Pigeon in Saint-Martin

Christopher Cambrone¹, Anthony Levesque², Frank Cézilly¹

¹*Caribaea Initiative, Le Raizet, Les Abymes, Guadeloupe*

²*Association Amazona, Pointe d'Or, Les Abymes, Guadeloupe*

Early detection of invasive species is crucial to prevent their spread and mitigate negative impacts on native species, ecosystems, and agrosystems. In the Caribbean island of Saint Martin, recent and recurrent observations of the Bare-eyed Pigeon (*Patagioenas corensis*), a species native to the arid lowlands of north-west South America, suggest a recent introduction and expansion of the species. This adaptable pigeon is typically found in dry shrublands, mangroves, and agricultural areas, but is also increasingly observed in residential zones and resort grounds. It often forms small flocks and can easily be confused with the White-winged Dove (*Zenaida asiatica*) in the Caribbean.

Using a combination of citizen science data and systematic field surveys conducted between 2012 and 2022, we reconstruct the timeline and pathways of the Bare-eyed Pigeon establishment in the binational island of Saint-Martin. Results show that the species has been probably introduced between late 2012 and early 2013 in the eastern part of Saint-Martin, close to the brackish pond called “Salines d’Orient”. Data analyses also indicate a rapid spread of the species across various habitats, including semi-natural and urban environments, which suggests a high ecological plasticity.

The rapid spread of the Bare-eyed Pigeon raises concerns about potential competition with native doves and pigeons, such as the White-crowned Pigeon (*Patagioenas leucocephala*), the White-winged Dove or the Common Ground Dove (*Columbina passerina*), which share similar resources and habitats. This study highlights the value of citizen science in detecting newly established exotic species, especially by providing valuable data to analyze the expansion dynamic and provide preliminary information to assess ecological risks to inform conservation strategies.

Rapid expansion of the invasive mourning gecko, *Lepidodactylus lugubris*, in Guadeloupe

Gloria Chance, Vivien Louppe, Frank Cézilly, **Christopher Cambrone**

Caribaea Initiative, Le Raizet, Les Abymes, Guadeloupe

The Caribbean region, as biodiversity hotspots, are among the most affected regions by invasive alien species. Its island ecosystems, characterized by high levels of endemism,

ecological specialization, and evolutionary isolation, make them particularly vulnerable to the introduction of non-native organisms. Invasive species often outcompete, prey upon, or displace native ones, leading to population declines, local extinctions, and the disruption of ecosystem functions. The increasing volume of inter-island transport, tourism, and global trade in the Caribbean facilitates the spread of invasive species across the archipelago. This is particularly true for small-bodied and cryptic species, which can remain undetected during transportation, early invasion stages, and established populations may remain unnoticed due to the secretive nature of their behavior or of their ecological habits, like nocturnal species.

Among them, the Mourning gecko (*Lepidodactylus lugubris*) has biological, ecological and behavioral traits that make it highly invasive. Much appreciated by herpetophiles, the species is native to parts of coastal Southeast Asia and the Indo-Pacific region. It has successfully established populations across numerous tropical and subtropical zones, becoming invasive on numerous islands and continental coastlines, particularly on the America continent. Its most remarkable feature is its parthenogenetic reproduction, allowing populations to arise from a single unfertilized female, and facilitating rapid colonization, especially on remote islands. Moreover, the species also lays durable and adhesive eggs that resist desiccation and tolerate saltwater exposure, enhancing both passive dispersal or human-mediated transport. The Mourning gecko is also a dietary generalist, capable of thriving in a wide range of habitats, from natural coastal ecosystems to urban infrastructure. Its nocturnal and secretive habits make it difficult to detect, often delaying awareness of its presence and spread. These combined traits make the species a particularly successful and inconspicuous invasive species, with a growing presence in the Caribbean island ecosystems.

In July 2022, the species was detected for the first time in Martinique, after successfully invaded The Bahamas, Cuba, Cayman Islands, Turks and Caicos Islands, Guadeloupe and Trinidad et Tobago. In this context, we present the results of a study conducted in 2022, which highlights the rapid spread of the Mourning gecko in Guadeloupe, using a combination of extensive and intensive field surveys. A total of 160 sites across urban, peri-urban, and natural habitats were surveyed to assess the species' distribution. Additionally, one specific site, a resort hotel, was surveyed once again to assess population growth over a four-year period. These results provide key insights into the current status and expansion dynamics of this cryptic invader in insular tropical ecosystems.

Compensating our environmental footprint: The Caribaea Initiative cactus restoration program in Haiti

Caribaea Initiative

37, rue Jean Jaurès, Le Raizet, Les Abymes, Guadeloupe

Scientific activities such as research, training, and international conferences often come with an environmental cost. As an organization committed to biodiversity conservation in the Caribbean, Caribaea Initiative has chosen to take concrete action to offset its ecological footprint. Since 2022, we have been implementing a habitat restoration project in Parc Cacique Henri, a protected semi-desert area in Anse-à-Pitres, southeastern Haiti.

This long-term program combines ecological restoration, biodiversity monitoring, and community engagement. One of its key components involves replanting native cactus species which provide essential food resources for two endangered iguana species (*Cyclura ricordi* and *Cyclura cornuta*) and contribute to carbon sequestration. By restoring a threatened ecosystem and supporting species conservation, this initiative serves as a model for mitigating the environmental impacts of scientific work.

Beyond restoration, the project also supports biodiversity research within the park, using a range of monitoring methods to better understand local wildlife, and aims to involve local communities in protecting their natural heritage. We intend to further develop this program to amplify its ecological and social benefits.

Improving access to Caribbean biodiversity data

Amy Deacon

Department of Life Sciences, The University of the West Indies, St Augustine, Trinidad and Tobago

Given the increasing threats facing the biodiversity hotspot of the Caribbean, there is an urgent need to access, share and generate biodiversity data in the region. Well-functioning natural history collections, and citizen science, can play key roles in documenting, monitoring and managing biodiversity. I showcase three recent projects we have undertaken at The University of the West Indies, St Augustine to improve access to biodiversity data in Trinidad and Tobago, with applicability to other Caribbean countries. Firstly we have established initiatives to generate new data through citizen science – including employing iNaturalist at our annual ‘Bioblitz’ event to engage more people in data collection. This was especially successful during the pandemic when we ran virtual ‘backyard bioblitzes’. Secondly, we have recently completed a project that digitized nationally important collections from our UWI Zoology Museum, the National Herbarium of T&T and the natural history collection of the National Museum of T&T, and published them on a global open access database – the Global Biodiversity Information Facility (GBIF). This has resulted in more than 60,000 natural history specimen records that were previously ‘hidden’ being accessible to anyone in the world. Thirdly, we have used these data in research, for example in a project on fish functional diversity, where morphological measurements of museum specimens added great value to a study of temporal changes in

freshwater fish assemblages. Alongside taxon-targeted scientific surveys, these approaches can help improve access to Caribbean biodiversity data, allowing more effective conservation and management.

Using molecular tools to detect and quantify impacts of invasive freshwater turtles in French West Indies

Jérémy Eudleur, Mirella Morgene, Christopher Cambrone

Caribaea Initiative, Le Raizet, Les Abymes, Guadeloupe

Invasive alien species (IAS) are a major threat to biodiversity, due to hybridization, competition, and predation on native species. These negative effects may be more pronounced in biodiversity hotspots such as the Caribbean, where native and endemic species inhabit in restricted island ecosystems, and are already under pressure from habitat loss.

Among IAS, the red-eared slider (*Trachemys scripta*) is among the world's 100 worst invasive species. Native to the southern North America, it has become the most widespread invasive species. Introduced through the pet trade, it has established populations on every continent except Antarctica. With its high adaptability, generalist diet, and long lifespan, it easily colonizes freshwater habitats, competes with native species, and disrupts local ecosystems.

In the French West Indies, the red-eared slider is found in sympatry with two other exotic freshwater turtles: *T. stejnegeri* and *Pelusios castaneus*. The first species is native to Puerto Rico and Hispaniola and has been introduced in the French West Indies through interisland travel since the Amerindian era. The second is native to West Africa and its history of introduction is more uncertain, probably during the transatlantic slave trade.

Current population monitoring mainly relies on visual surveys, which may lead to false negatives, particularly for nocturnal species like *P. castaneus*, or low density population. To overcome these limitations, DEVIMTOR project aims to develop efficient methods using environmental DNA (eDNA) using water and sediment samples. The particular objective of this project consists in (1) identifying the most reliable eDNA detection methods under tropical conditions (UV exposition, water temperature, turbidity, etc.) and (2) improving knowledge of the spatial distribution of these species in Guadeloupe and Martinique. Moreover, capture campaigns will be conducted to collect and analyze stomach contents so as to quantify the impact of these exotic freshwater on local fauna and flora relying on metabarcoding approach.

These approaches will provide a comprehensive assessment of the ecological impacts of alien freshwater turtles in the French Antilles, supporting local authorities about the management of these species, and offer a transferable method for detecting and managing these species across the Caribbean.

One Shark: An integrated approach to Tiger shark conservation and risk management in the Caribbean

Hadrien Bidenbach^{1,2}, Eric Clua³ & **Mark Freeman**⁴

¹*Groupement d'Intérêt Public ONE-SHARK, Saint Martin*

²*Université de Perpignan Via Domitia, UMR 5110 CEFREM, Perpignan, France*

³*EPHE-UPVD-CNRS, UAR 3278 CRIOBE, Paris Science et Lettres (PSL) Paris University, Papetoai, Moorea, French Polynesia*

⁴*Center for Conservation Medicine and Ecosystem Health, Ross University School of Veterinary Medicine, St. Kitts*

The 'One Shark' project aims to reconcile the conservation of tiger sharks (*Galeocerdo cuvier*) with the safety of sea users across the Caribbean. Recognizing the ecological importance of this apex predator and the socio-economic stakes tied to maritime activities, the project adopts a multidisciplinary strategy to mitigate shark-related risks while safeguarding marine biodiversity.

This initiative combines advanced scientific methodologies—including individual genetic profiling, satellite tagging, and spatial-behavioral tracking—to build a reference database and improve our understanding of tiger shark ecology, movements, and population dynamics. A key focus lies in identifying potentially dangerous individuals, in line with the "problem individuals" hypothesis, to support informed and selective risk mitigation rather than indiscriminate culling.

At the heart of One Shark is a participatory network involving fishers, tourism professionals, scientists, and public authorities. The project fosters public engagement through targeted outreach: awareness campaigns in schools, safety and first aid training for maritime stakeholders, and the dissemination of good practices for ocean users. This collective and proactive approach promotes a virtuous circle where conservation efforts enhance public safety, support local economies, and protect the ecological role of tiger sharks.

By integrating real-time data analysis with stakeholder collaboration across national and regional levels, One Shark aspires to become a model for sustainable shark risk management in tropical marine ecosystems—enhancing both human safety and environmental stewardship.

How Conservation Standards adaptive management framework can help you to write better research and conservation funding proposals and increase the impact of your conservation actions.

James Goetz

Vermont Center for Ecostudies, USA

The difference between work and hard work is the right tool. Unfortunately, too many proposal writers still lack the right tools to write top quality proposals that will win funding for their important research and conservation actions. (Spoiler alert: the right tool is not ChatGPT.) No single tool can make writing successful proposals easy, but one thing that many people lack is simply a coherent framework that guides them through the critical steps. Proposal writers gain a great advantage when they know, step-by-step, how to develop a project vision and scope, how to select appropriate conservation targets (i.e. species and/or ecosystems) and how to focus on them at the optimal scale. Further, proposal writers need a systematic process to collaboratively explore and gain a deep understanding of how the negative pressures (i.e. threats) affect the conservation targets, and, in turn, what the indirect and root causes (ecological, socioeconomic, etc.) of those pressures are. Then, of course, they need an equally systematic process to develop effective strategies with clearly articulated theories of change that will change negative pressures into positive results for the species and ecosystems of concern. Last, they must show that they have budgeted well, and analyzed potential risks and negative side effects in their operational plan, as well as have demonstrated how they will monitor, evaluate and learn from the results of their research or conservation actions, and share that learning widely. Not only are such coherent, well-thought-out projects more likely to receive funding, they will also have more positive impact, fewer unintended negative consequences, and more learning and sharing. Having recognized the great challenges to funding and implementing conservation actions, the Conservation Measures Partnership has been working over the past two decades to combine principles and best practices in adaptive, results-based management from conservation and other fields to create the *Open Standards for the Practice of Conservation*, or *Conservation Standards* (CS). This poster provides an overview of CS principles and practices, and highlights those that are most important for writing successful proposals to fund research and conservation projects.

The possible implications of a Dinoflagellate parasitizing Cascadu (*Hoplosternum littorale*) in Trinidad

Janelle St. Aime¹, Reia Guppy¹, Arthur Potts¹, Rod Suepaul²

¹*The University of Trinidad and Tobago, Centre for Maritime and Ocean Studies, Trinidad*

²*The University of the West Indies, School of Veterinary Medicine, Trinidad*

The cascadu (*Hoplosternum littorale*) is a freshwater fish native to Trinidad and consumed as a delicacy. It is commonly cultured with other species because of its benthic and hardy nature. A preliminary survey of potential parasitic organisms of this fish was conducted from November 2023 to May 2025. Most common, was a gill parasite resembling that of the *Oodinium* spp. family and has been identified in both farmed and wild fish, regardless of age, gender or seasonality. Presented here are the pictorial evidence of the *Piscinoodinium* spp. at all life stages, in the cascadu population in Trinidad. *Piscinoodinium* spp. belongs to the *Oodinium* spp. family of dinoflagellates which are associated with various fish diseases. Dinoflagellates produce a variety of toxins harmful to man and cause mass fish mortalities, with a potential for catastrophic public health concerns. *Piscinoodinium* spp. has been implicated in 'velvet disease' with unknown toxicities or One Health implications.

Indicator of the state of birds in the islands of Guadeloupe, an awareness-raising tool

Catherine Hermant, Lisel Loschenkohl

Agence régionale de la biodiversité des îles de Guadeloupe, Gourbeyre, Guadeloupe

The Regional Biodiversity Observatory of the Guadeloupe islands produce indicators of the state of biodiversity to understand its status and trends. This tool is intended to raise awareness among the public and public policymakers. This symposium will present the methodology used to create these indicators. The indicator of the state of birds in Guadeloupe will be presented as an example. Recognizing that this topic may be of interest to the Caribbean islands, these productions have been translated into English, and some even into Spanish.

This indicator aims to report on the status and trends of the avifauna of the Guadeloupe archipelago. Birds are among the best-studied groups of species due to their relatively easy detection. Indeed, many species produce vocalizations for various reasons, such as defending their territory or attracting mates, which facilitates inventories and monitoring. This provided

qualitative data over the past 40 years and quantitative data on biodiversity changes over the past 10 years.

The summary results of this indicator, presented in illustrative form, show that there are 295 bird species in Guadeloupe, with 84 breeding bird species, including 60 sedentary ones. The Red List of Guadeloupe's fauna shows that 7 species have disappeared, including 2 globally. In addition, 31 species are threatened, representing 18% of the assessed species. Fifteen introduced species have also been recorded in the territory, including 3 invasive species. This data will be updated each time the indicator is updated and will allow us to see the evolution of this group of species.

The indicator ends in a threat and solution diagram, presented in illustrative form, to understand what threatens these species and the solutions implemented locally. This information could be a source of inspiration for the Caribbean islands, which are also home to most of the region's migratory species.

This collected data, validated by a network of experts, has been produced by local experts. The development of this tool in the Caribbean islands could make it possible to monitor the evolution of this group of species across the Caribbean. This could create synergy between experts in the region and spur to implement similar monitoring that will contribute to the indicators.

Lessons from the wetland: Two decades of experience in the management of the endemic Manjuari fish (*Atractosteus tristoechus*) and the invasive Catfish (*Clarias gariepinus*) in the Zapata Swamp, Cuba

Andres Hurtado Consuegra

Company for the Conservation of the Zapata Swamp, Cuba.

The manjuarí (*Atractosteus tristoechus*), an endemic fish and biological relict in Critical Danger of Extinction, has experienced a drastic population decline in its historical range, where it was abundant until two decades ago. In this paper, we present the results of the *ex situ* and *in situ* conservation actions developed by a modest hydrobiological station in the Protected Area of Managed Resources Ciénaga de Zapata, Cuba, in collaboration with local and foreign experts and institutions. The station has an infrastructure with the elementary conditions for the captive reproduction of the manjuarí, from adult individuals captured in the wild, with the aim of mastering the technology of reproduction and development in captivity and reintroducing the species into its natural habitat. After several years of testing, an Operational Working Procedure was established for the *ex situ* reproduction and development of the manjuarí, with positive results. As a complementary study, the impact of the *Clarias* or African catfish present

in the area (*Clarias gariepinus*), introduced in Cuba for aquaculture due to its low production cost and high productivity, is evaluated. The stomach contents of 1019 specimens captured in the wetland in the first 10 years after being detected in the Zapata Swamp were analyzed. The study confirms the wide variety of foods that make up the diet of *C. gariepinus*, posing a threat to the native biodiversity of the swamp, including the manjarí.

Coral reef status indicator of the Guadeloupe islands as a scientific popularization document

Lisel Loschenkohl, Catherine Hermant

Agence régionale de la biodiversité des îles de Guadeloupe, Gourbeyre, Guadeloupe

The Regional Biodiversity Observatory of the Guadeloupe islands is the first observatory to have published biodiversity indicators in the French overseas territories. Indicators are short and summarized reports of eight pages which underline the state of biodiversity to understand its status and trends. They are tools intended to raise awareness among the public and public policymakers.

This publication and its main results are intended to inspire and encourage other Caribbean territories to use these freely available tools in digital format and to adapt them considering their local specificities.

Here, the presentation will focus on a marine indicator about the state of coral reefs in Guadeloupe archipelago. Coral reefs are a well-known ecosystem that has been monitored for over twenty years, with more than thirty permanent monitoring stations, plus others. This accumulated knowledge has enabled scientists to highlight the degradation of coral reefs around the archipelago over the years.

The presented work is the result of a collaboration between several scientific partners in the area. It aims to report on the current state of knowledge, the updated health status of coral reefs around Guadeloupe (years 2023-2024), the conservation status of emblematic coral reefs species, and the main threats they are facing. The summary results show that 21 coral species found in the Caribbean are threatened by extinction, i.e. 43% of the species assessed. Around the archipelago, the most recent episode of extreme bleaching occurred in 2023 and 89% of the reefs sampled are suffering from degradation. Out of the approximately sixty coral species living in Guadeloupe, 16 are protected, including the emblematic *Acropora* genus.

With many visual elements such as quantitative data (tables, maps, graphs) but also photographs and illustrations, this indicator is a scientific popularization report on coral reefs adapted to the Guadeloupe archipelago. All the collected data were provided and validated by

experts on the topic, and the target of developing this tool could be to create a network in the Caribbean islands.

Pathways through paradise: reconciling coastal development and biodiversity in Rincón, Puerto Rico

Nathene Logie¹, **Julie North**², Laura Marie Rosario Sanchez³, Shalini Sookoo⁴

¹*St. Eustatius National Parks Foundation, Trinidad & Tobago*

²*Surfrider Foundation Rincón, Rincón, Puerto Rico*

³*Universidad Autónoma de Santo Domingo, República Dominicana*

⁴*Univeristy of Trinidad and Tobago - Faculty of Science and Technology, St. Augustine, Trinidad*

The Caribbean faces growing tensions between sustainable development, biodiversity conservation, and the socio-economic demands of tourism. In Rincón, Puerto Rico, the construction of a proposed bike path through a stretch of ecologically sensitive coastline has sparked widespread concern among scientists, community members, and environmental advocates. Branded as a recreational enhancement and tourism booster, the path would cut through key coastal habitats, including nesting grounds for endangered sea turtles and marine ecosystems adjacent to the Tres Palmas Marine Reserve.

This poster presents a multidisciplinary case study of the Rincón bike path controversy, exploring how infrastructure planning intersects with biodiversity conservation and local agency. Drawing from environmental science, community activism, and sustainable development frameworks, we examine the challenges and opportunities of aligning infrastructure with ecological stewardship in small-island contexts. Central to this project is the examination of the ecological risks posed by the proposed path route, particularly its encroachment on federally and locally protected coastal habitats alongside the procedural shortcomings in the project's rollout, including a lack of comprehensive Environmental Impact Assessments (EIA), insufficient public consultation, and expired permitting.

Using a combination of GIS-based mapping, community interviews, and legal reviews, this project highlights how bottom-up movements can serve as a check on top-down development initiatives. Comparisons are made with other Caribbean nations that have successfully implemented eco-sensitive infrastructure (e.g., raised boardwalks in mangroves, communitydesigned paths with minimal ecological footprints). These case studies are vital to outline a checklist for best practices with “Conservation-Compatible Development,” in mind and encouraged by IUCN guidelines and local planning laws.

Furthermore, the poster explores how regional cooperation across Caribbean nations can foster shared frameworks for sustainable tourism that uplift local livelihoods while preserving biodiversity. Rincón’s experience underscores the importance of interdisciplinary collaboration

between scientists, policymakers, planners, and citizens in negotiating development outcomes that are both socially just and ecologically sound.

A publicly accessible platform, PaseoResponsable.com, consolidates research findings, legal analyses, and a petition supported by grassroots organizations available in an attached QR code below. The initiative calls for a re-evaluation of the path project through transparent, participatory processes that prioritize environmental safeguards and community inclusion.

As climate change accelerates the vulnerability of island ecosystems, the Rincón case serves as both a warning and a roadmap: a cautionary tale of planning without precaution, and a hopeful illustration of how engaged citizenry and science-based advocacy can redirect development toward a more sustainable future for Puerto Rico and all Caribbean islands.

Acoustic characterization of Fort-de-France Bay, Martinique

Marion Poupard¹, Célia Ortolé¹, Anatole Gros-Martial¹, Coline Violo¹, and

Benjamin de Montgolfier^{1,2,3}

¹*Aquasearch, Sainte-Luce, Martinique*

²*Institut des Sciences de la Mer (ISMER), Université du Québec, Rimouski (UQAR), Canada*

³*Bio – Laurentia, St-Anaclet-de-Lessard, Canada*

A passive acoustic monitoring study was conducted in Fort-de-France Bay, Martinique, to assess ambient noise levels and their potential impact on cetaceans. Hydrophones were deployed across 21 sampling points at depths of 10 to 20 meters, recording day and night sessions across multiple seasons. Results revealed that noise levels were significantly higher during the day, with an average increase of 10 dB compared to nighttime, primarily due to maritime traffic. The highest noise intensities were recorded along the main shipping lane between Fort-de-France and Trois-Îlets, correlating with high ferry and commercial vessel activity.

Anthropogenic noise sources included passenger ferries, container ships, and aircraft overflights, with ferries contributing up to a 17.5 dB increase in sound levels within 100 meters of the hydrophone. Long-term recordings indicated that cetacean presence was largely confined to the bay's outer periphery, with dolphin whistles detected at offshore monitoring points but absent within high-traffic zones. These findings suggest that elevated noise levels within the bay may deter cetaceans from utilizing the area, potentially impacting their habitat use and communication.

This study highlights the need for targeted management strategies to mitigate anthropogenic noise impacts, such as vessel speed reductions or alternative navigation routes. Further

research with long-term autonomous acoustic monitoring is necessary to quantify seasonal variations and develop conservation measures for marine mammal protection in the region.

This study was co-financed by the GPMM (Grand Port Maritime de la Martinique), Aquasearch and the OFB (Office Français de la Biodiversité).

Assessment and long-term monitoring of soil quality in overseas territories: A focus on soil biodiversity

Lilou Vanoverbeke

INRAE, ASTRO Research Unit, Guadeloupe

The RMQS program (Soil Quality Monitoring Network) aims to assess and monitor the longterm evolution of soil quality in French territories, with a particular focus on their biological, physical, and chemical properties. This program, based on a proven model in mainland France, tracks soil changes across the country, with nearly 2,500 sites monitored for over 20 years.

A second sampling campaign is currently underway in Guadeloupe and will continue until 2027. In Martinique, it will begin in 2026. The metropolitan model has been adapted to account for the specific characteristics of the Overseas Territories, particularly tropical rainforests and mangroves, in order to better address the diversity of local environments. This adaptation allows for more precise monitoring of the unique soil characteristics of the French Overseas Territories, with a particular emphasis on soil biodiversity.

In Guadeloupe, the program is based on rigorous sample collection protocols across 60 sites, covering a wide range of soil types and land uses. The program benefits from local partnerships, including with the Guadeloupe National Park, to strengthen its scientific and ecological impact.

As part of this overseas monitoring, soil samples are collected annually from 60 measurement points in Guadeloupe, and from 40 additional points in Martinique starting in 2026. These samples are taken every fifteen years to measure the evolution of properties in agricultural soils, pastures, forests, and natural environments. The analysis covers a wide range of parameters, including biodiversity, pH, water reserves, contaminants, and carbon content. These data thus provide a comprehensive overview of soil quality and its long-term changes.

The information gathered by the RMQS program is essential for guiding public policies, improving soil management, combating climate change, and assessing risks to human health. Once analyzed, the samples are archived by the European Soil Sample Repository (CEES), creating a living record of the soils of France and its Overseas Territories. These archives will

allow future generations to better understand the long-term evolution of soils and make informed decisions for the preservation of biodiversity and sustainable soil management.

Trees for me and my island

Mark Yokoyama

Les Fruits de Mer, Saint-Martin

St. Martin is a small island in the Lesser Antilles. In the decades since 1960, the population has grown rapidly and many natural spaces were destroyed by development, particularly in coastal lowlands. In order to promote the planting of native plants in backyards, neighbourhoods, roadsides and government properties, the Les Fruits de Mer association has developed a book promoting native trees for landscaping use. *Trees for Me and My Island* is a short book featuring twenty native trees. The book is written for a general audience. It is focused primarily on the benefits these trees provide people (fruit, shade, etc.) and the local cultural and historical connections with these trees (folklore, plant medicine, foodways, traditional uses of wood or resin, etc.). The book also highlights the ecological benefits of each tree and the relationships they have with wildlife on the island. Our hope is that by focusing first on the tangible benefits of planting these trees and their cultural significance, we can generate interest in planting these trees instead of imported and non-native trees. This book can also be a starting point for institutions and government to do more wildlife friendly planting. This in turn will create a market for native trees. We believe by taking a people-first approach to promoting these trees, and creating an enjoyable and widely distributed book, we can kickstart a change in awareness and attitudes about the trees we plant. Urban areas on St. Martin are part of the island's reality now and for the future, but there are opportunities to make them more ecologically vibrant. Future versions could include additional native trees and plants, with each new volume or addition creating new opportunities to promote native plants and trees.

Our partners and sponsors

We warmly thank all our partners and sponsors for their valuable support in organizing the conference. Thanks to their commitment, this unique event dedicated to research and conservation of Caribbean wildlife can take place under the best conditions.

GOLD PARTNERS

Our Gold-level partners provide major financial support to the conference, making it possible to hold thematic symposiums and key social events. Their involvement reflects their commitment to preserving Caribbean biodiversity and supporting regional scientific initiatives.

- **Fédération Départementale des Chasseurs de Martinique** and **Fédération Départementale des Chasseurs de Guadeloupe**

These two institutions are involved in the sustainable management of wildlife and the promotion of responsible hunting in their respective territories. They are also partners of Caribaea Initiative through the ESPACYPA project, which aims to improve knowledge of the ecology and population dynamics of certain game and heritage bird species in the Lesser Antilles.

Both federations co-fund the symposium *“Hunting, Wildlife Management and Conservation in the Insular Caribbean”* and will be present at this key moment.



FEDERATION DES CHASSEURS
DE LA MARTINIQUE



- **Groupe Comte-Serres** and **Rhum Chantal Comte**

Groupe Comte-Serres is a family-owned company founded in 1919, now established in the French Caribbean, especially in the automotive distribution sector (Toyota, Mercedes-Benz, etc.). The group is a committed partner of Caribaea Initiative, notably through its Citadelle subsidiary. Rhum Chantal Comte, known for its high-end cuvées from the best distilleries in the Antilles, is also a loyal supporter of our work. Together, they co-fund the June 12 banquet evening, during which the winning photos of our photo contest will be revealed.



SILVER PARTNERS

Our Silver partners actively support the conference and play a central role in biodiversity preservation in the overseas territories.

- **Office de l'eau de Martinique (ODE)**

A local public institution, ODE works to ensure the sustainable and coordinated management of water resources and aquatic environments. It co-funds the symposium *“Ecology and Conservation of Aquatic Ecosystems and Species in the Insular Caribbean.”*



- **Office française de la biodiversité (OFB)**

A public agency under the supervision of the Ministries of Ecology and Agriculture, the OFB works to protect and restore terrestrial, aquatic and marine biodiversity in mainland France and the overseas territories.



- **Direction de l'Environnement, de l'Aménagement et du Logement (DEAL) Martinique**

As the State's environmental authority in Martinique, the DEAL implements public policies related to biodiversity, land planning, housing, and natural risk prevention. It supports regional scientific initiatives for biodiversity preservation.



BRONZE PARTNERS

Our Bronze-level partners offer valuable support, notably by facilitating the participation of speakers or by supporting targeted actions.

- **French Embassy in Cuba:** Thanks to its support, two Cuban researchers specialized in conservation will be able to attend the conference.



- **Grand Port Maritime of Martinique:** A co-funder of the symposium *“Ecology and Conservation of Aquatic Ecosystems and Species in the Insular Caribbean,”* the Grand Port demonstrates its commitment to marine environment preservation.

