Caribbean Natural History Conference 2025 Abstracts

Post-Eruption Assessment and Habitat Associations of the Whistling Warbler using PROALAS Surveys

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Abstract: The endangered *Catharopeza bishopi* (Whistling Warbler) is a little-known songbird found only on the volcanic St. Vincent Island in the Lesser Antilles. In April 2021, eruptions of La Soufrière volcano severely impacted the island's forests, raising concerns about the effects on vulnerable bird populations. We conducted surveys in 2022-2024 after the volcano eruption to assess Whistling Warbler occupancy and habitat use. We surveyed 94 points across 17 sites in mid-elevation forests using 10-minute PROALAS standardized point counts, supplemented with 5-minute playback surveys. Whistling Warblers were estimated to occupy 28% of the surveyed points. More warblers were present in wetter forests with moss and on the windward (east) side of the island. Whistling Warbler occupancy probabilities were also higher at mid-elevations (400-650 m) and in primary forest and palm brake, and warbler occupancy was lower in tree plantations. Our study presents a model example of using PROALAS bird surveys in the Caribbean. We suggest protecting wetter, montane, natural forests from further development and agriculture to best conserve the Whistling Warbler.

Session: Caribbean Ornithology II

New Initiatives in Bird Banding in the Caribbean

Nuevas iniciativas de anillamiento de aves en el Caribe

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Abstract: Since its inception The Institute for Bird Population's MoSI program has sought to link standardized monitoring of birds across the hemisphere. The program uses passive mist netting, bird banding, and a host of physiological metrics to track birds across their full annual cycle. Cooperators include hundreds of individuals in more than 20 countries. The program has recently greatly expanded, with programs that include micro-grants for the purchase of banding equipment, and a fellowship program

for Latin American and Caribbean bird banders. In 2026 we will roll out a new data portal that will make hundreds of thousands of banding records available to researchers across the hemisphere. In this presentation, I will describe these latest developments, and explain how to participate.

Resumen: Desde su creación, el programa MoSI del Instituto para la Población de Aves (IBPO) ha buscado establecer un sistema estandarizado de monitoreo de aves en todo el hemisferio. El programa utiliza redes de niebla pasivas, anillamiento y diversos indicadores fisiológicos para rastrear a las aves a lo largo de su ciclo anual completo. Cuenta con la colaboración de cientos de personas en más de 20 países. Recientemente, el programa se ha expandido considerablemente, incluyendo microsubvenciones para la adquisición de equipos de anillamiento y un programa de becas para anilladores de aves de América Latina y el Caribe. En 2026, lanzaremos un nuevo portal de datos que pondrá a disposición de los investigadores de todo el hemisferio cientos de miles de registros de anillamiento. En esta presentación, describiré estos avances y explicaré cómo participar.

Session: Caribbean Ornithology II

Manatees of the Wider Caribbean: Building a Regional Alliance for Conservation

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Abstract: Manatees rely on the Caribbean's rich mosaic of coastal habitats—including seagrass beds, estuaries, rivers, and freshwater springs—but these environments are increasingly threatened. Across the region, manatee populations are declining, genetically eroding, and becoming more isolated. Expanding anthropogenic pressures—habitat degradation, vessel collisions, entanglement, pollution, and illegal hunting—intensify their vulnerability, while climate-driven impacts such as sea-level rise, extreme weather, and freshwater loss disproportionately affect island nations. Despite the urgency, conservation efforts often struggle with limited funding, fragmented data, and the challenges of working across diverse linguistic, cultural, and political contexts. In response, the Wider Caribbean Manatee Alliance (WCMA) was created to unite scientists, agencies, NGOs, communities, and regional partners in a coordinated, collaborative framework. The Alliance works to (1) build strong stakeholder networks; (2) expand scientific research to fill critical knowledge gaps; (3) strengthen conservation and monitoring capacity across nations; and (4) improve regional rescue, rehabilitation, and release capabilities. By fostering shared priorities, mobilizing resources, and integrating community engagement, the WCMA aims to secure a sustainable future for the Greater Caribbean manatee and the coastal ecosystems and cultural heritage it represents. This presentation highlights the Alliance's vision, progress, and next steps for regional action.

Session: Advances in Marine Mammal Conservation Science in the Wider Caribbean Region

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Seasonality of Fishes on a High-latitude Reef and its Influence on Spearfishing Catch and Activity

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Abstract: Florida's Coral Reef (FCR) is a subtropical system that experiences seasonal fluctuations in water temperature of 8 – 10 °C, which are likely reflected in resource availability and may result in seasonal shifts in fish community structure. Shifts may include changes in species composition, abundance, and behavior, such as decreased activity during colder months or seasonal increases in areas where resources are plentiful. However, the relationship between season and reef fish communities on FCR has yet to be investigated. Seasonality research is of particular importance because FCR is utilized by a high concentration of recreational spearfishers and anglers, and seasonal patterns in reef fish communities are likely to be reflected in recreational spearfishing catch and activity. Surveys, such as the Marine Recreational Information Program, overlook the activities of spearfishers due to combining spearfishing catch with hook and line angling. To accurately assess ecosystem health and fisheries' status, Florida requires information about seasonal and historic catch trends for all sectors of the recreational fishery, not just hook and line angling. Further, regular interaction with FCR prepares spearfishers to be sensitive to environmental change, demonstrating a unique form of fishers' ecological knowledge. This study investigates how seasonality affects fish community composition within FCR, and how these seasonal changes affect spearfisher catch and activity. The objectives of this study are: (1) document seasonal and spatial differences in fish abundance, biomass, community composition, and behavior along FCR using stereo-diver operated video data; (2) survey Florida's spearfishing community to identify seasonal and historic catch trends and spearfishing context; and (3) document spearfishers' ecological knowledge and relate it to observed shifts in community composition and behavior.

Session: Marine fishes of the Wider Caribbean

Immune Response of *Ciona robusta* to Microplastic-Associated Bacterial Biofilm

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Abstract: Microplastics (MPs) are persistent pollutants that provide novel surfaces for microbial colonization, leading to the formation of complex biofilms collectively known as the "plastisphere." These biofilm-coated MPs may influence host–microbe interactions and disrupt immune processes in marine invertebrates; however, their immunological impacts remain poorly understood. This study investigates the innate immune response of the solitary ascidian *Ciona robusta* following short-term exposure to MPs and associated bacterial biofilms. Germ-free juveniles cultured in the lab will be

exposed for 48 hours to four treatments: control (marine broth), MPs only, free-living bacteria (*Vibrio parahaemolyticus*, *Pseudoalteromonas spp*., and *Escherichia. coli*), and biofilm-coated MPs. Juveniles will be pooled per replicate for RNA extraction and quantitative PCR analysis targeting Toll-like receptor 2 (TLR2) and tumor necrosis factor-alpha (TNF-α), with GAPDH serving as a reference gene. Statistical analyses will compare relative gene expression among treatments to assess immune activation and potential stress responses. It is expected that biofilm-coated MPs will trigger stronger immune responses than MPs or bacteria alone. Overall, this research will advance understanding of how MPs and their microbial communities influence host immunity and reinforce *C. robusta* as a valuable model for assessing the biological and ecological implications of microplastic pollution in marine ecosystems.

Session: Invertebrates in the Gulf of Mexico: Responses to Anthropogenic Influences

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Distinguishing sympatric crocodile species through head shape analysis and Geometric Morphometrics in the Yucatán Peninsula

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Abstract: The two crocodile species *Crocodylus acutus* and *C. moreletii* have an extended sympatric distribution, where they have been hybridizing for a vast period of time. These cryptic hybrids present phenotypical similarities to one of the parental species, with or without atypical characteristics. Most previous studies on head morphology between these two species have focused on skull linear morphometric shape differences without including admixture individuals. In the current work, we used Geometric Morphometric techniques (GM) based on landmarks and sliding landmarks to compare the head shape of live individuals from the three groups. We compiled a photographic database from genetically confirmed parental populations spanning the Yucatán Peninsula in the southeast of Mexico (C. moreletii from the state of Tabasco, Campeche and Yucatán, C. acutus from Oaxaca and Quintana Roo) and added collected images of an admixture population captured during fieldwork in the Yum Balam Protected Area (northern Yucatán Peninsula). The head shapes of the groups were found to be statistically different, while also getting significant effects of shape change in function of size (allometry). Thin-plate spline deformation grids allowed the visualization of the differences between the head shapes, whereas several classification methods ranging from machine-learning to multivariate analysis were used to assess the effectiveness of GM techniques in distinguishing between the species or the admixture group based on head shape variation. Our results underscore the importance of a multidisciplinary approach for effective conservation and management of crocodile populations and highlight the value of Geometric Morphometric techniques to identify phenotypically similar groups.

Session: Crocodylians of the Caribbean

Ti Whale An Nou: Five Years of Regional Cooperation, Research, and Conservation for Cetaceans in the Lesser Antilles and Beyond

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Abstract: The Caribbean hosts one of the world's richest diversities of cetaceans, yet knowledge gaps, fragmented governance, and limited local capacity have long hindered effective conservation. Since 2021, the Caribbean Cetacean Society (CCS) has implemented Ti Whale An Nou, the first long-term, standardized, multi-island cetacean research and cooperation program across the Lesser Antilles and, more recently, the Dominican Republic and the ABC islands.
Over five years, CCS has produced one of the largest dataset on cetacean distribution, movements, and threats in the region through visual surveys, photo-identification, passive acoustic monitoring, and community engagement. Key results include inter-island movements, distribution maps of several species. Beyond scientific outputs, the project has trained more than 250 Caribbean nationals, strengthened governmental collaboration, and supported marine mammal sanctuary development aligned with 30×30, the SPAW Protocol, the IWC, and the Ocean Decade. This presentation summarizes some of the recent scientific results of the past five years and outlines how regional cooperation and data-driven management can transform cetacean conservation in the Caribbean.

Session: Advances in Marine Mammal Conservation Science in the Wider Caribbean Region

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Seabirds of the Northeastern Caribbean Costa Rica: Two Years of Observations at Sea

Las aves marinas del Caribe Noreste de Costa Rica: dos años de observaciones en el mar

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Abstract: From a biological perspective, the marine sector of Costa Rica's Northeastern Caribbean has been little explored, representing a gap in knowledge regarding the region's biodiversity. Seabirds are among the least-studied groups in this area. Currently, a cetacean monitoring program is being implemented across the three marine areas under some category of management within the Área de Conservación Tortuguero. This effort is also being used to record the seabirds present in the region.

Between 2023 and 2024, a total of 25 offshore surveys were conducted, during which 22 seabird species were identified. The most representative species were *Chlidonias niger* (Black Tern), *Onychoprion anaethetus* (Bridled Tern) and *Thalasseus maximus* (Royal Tern). Sixteen species of seabirds were sighting in "Dos Aguas" current (where sargassum, organic and inorganic matter accumulate) with *Chlidonias niger*, *Onychoprion anaethetus*, *Anous stolidus* (Brown Noddy) and *Puffinus iherminieri* (Sargasso Shearwater) being the most representative species. There are also records of interest, such as *Hydrobates castro* and *Phalaropus lobatus*, may represent the first records for the Central American Caribbean. The information gathered through this study will serve to establish a baseline on seabird richness in the Northeastern Caribbean, supporting the understanding and management of biodiversity within the region's marine protected areas.

Resumen: Desde el punto de vista biológico el sector marino del Caribe Noreste costarricense ha sido poco explorado, representando un vacío de información en cuanto a la biodiversidad presente. Las aves marinas son uno de los grupos menos conocidos para el área. Actualmente se implementa un monitoreo de cetáceos en las tres áreas marinas bajo alguna categoría de manejo ubicadas en el Área de Conservación Tortuguero, esfuerzo que es aprovechado para registrar las aves presentes en el sitio. Entre el 2023 y 2024 se realizaron 25 salidas al mar, donde se identificaron 22 especies de aves marinas. Las especies con mayor representatividad fueron *Chlidonias niger* (Charrancito Negro), *Onychoprion anaethetus* (Charrán Embridado) y *Thalasseus maximus* (Charrán Real). Se identificaron 16 aves marinas en la corriente "2 aguas" (donde se acumula sargazo, desechos orgánicos e inorgánicos), siendo *Chlidonias niger*, *Onychoprion anaethetus*, *Anous stolidus* (Tiñosa Común) y *Puffinus iherminieri* (Pardela del Sarazo) las especies con mayor representación. Además, hay avistamientos de interés como *Hydrobates castro* y *Phalaropus lobatus*, que podrían representar los primeros registros para el Caribe centroamericano. La información recopilada en este trabajo se utilizará para generar la línea base sobre la riqueza de aves marinas presentes en el Caribe Noreste, lo cual apoyará en el conocimiento y gestión de la biodiversidad presente en las áreas marinas protegidas.

Session: Caribbean Ornithology I

American Crocodiles (*Crocodylus acutus*) As Restoration Bioindicators in the Florida

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Abstract: The federally threatened American crocodile (*Crocodylus acutus*) is a flagship species and ecological indicator in Florida Everglades. We conducted a long-term capture-recapture study on the South Florida population of American crocodiles from 1978 to 2015 to evaluate hydrological restoration effects. The study produced 10,040 crocodile capture events of 9,865 individuals and more than 90% of captures were of hatchlings. Body condition and growth rates of crocodiles were highly age-structured with younger crocodiles presenting with the poorest body condition and highest growth rates. Mean crocodile body condition in this study was 2.14 ±0.35 SD. Crocodiles exposed to hypersaline conditions (> 40 psu) during the dry season maintained lower body condition scores and reduced growth rate by 13% after one year, by 24% after five years, and by 29% after ten years. Estimated hatchling survival was 25% increasing with ontogeny and reaching near 90% survival at year six. Hatchling survival was 34% in NE Florida Bay relative to a 69% hatchling survival at Crocodile Lake National Wildlife Refuge and 53% in Flamingo area of Everglades National Park. Hypersaline conditions negatively affected survival, growth and body condition and was most pronounced in NE Florida Bay, where the hydrological conditions have been most disturbed. The American crocodile, a long-lived animal, with relatively slow growth rate provides an excellent model system to measure the effects of altered hydropatterns in the Everglades landscape. These results illustrate the need for continued long-term monitoring to assess system-wide restoration outcomes and inform resource managers.

Session: Crocodylians of the Caribbean, Plus Fossil Primates

Investigating Landscape Drivers of Bahama Parrot Nest Site Selection on Great Abaco

Investigación de los factores paisajísticos que influyen en la selección de los lugares de nidificación del loro de las Bahamas en Great Abaco

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Abstract: The endangered Bahama Parrot (*Amazona leucocephala bahamensis*) has been extirpated across its historic range and is now restricted to just two islands. Parrots on Abaco are the only parrots known to nest in underground limestone cavities and have adapted to nesting in the fire-dependent Caribbean pine forest ecosystem. The landscape characteristics driving their distribution and nest site selection on the island, however, are unclear. I aim to quantify the breeding population, nesting range, and spatial patterns of nesting site occupancy of Abaco Parrots and determine which landscape factors drive their nest site selection. I used distance sampling at 120-point count stations across southern Abaco, followed by systematic nesting surveys using walking transects. I will utilize remotely sensed data in analyzing landscape drivers of nest site selection, including proximity to critical non-breeding habitat, forest structure, fire history, and geological features. Terrestrial LiDAR was used to collect metrics on forest structure around nest cavities. Reuse rates of historical nest sites were significantly lower than expected, likely due to the overgrowth of the forest understory from the lack of fires within the nesting

area in recent years. Preliminary findings have already sparked management actions to restore the nesting habitat and predator control efforts.

Resumen: El loro de las Bahamas (*Amazona leucocephala bahamensis*), una especie en peligro de extinción, ha sido exterminado en toda su área de distribución histórica y ahora se encuentra restringido a solo dos islas. Los loros de Abacoson los únicos loros que se sabe que anidan en cavidades subterráneas de piedra caliza y se han adaptado a anidar en el ecosistema forestal de pinos caribeños, que depende del fuego. Sin embargo, las características del paisaje que determinan su distribución y la selección de los lugares de anidación en la isla no están claras. Mi objetivo es cuantificar la población reproductora, el área de anidación y los patrones espaciales de ocupación de los sitios de anidación de los loros de Abacoy determinar qué factores del paisaje determinan la selección de sus sitios de anidación. Utilicé muestreo por distancia en 120 estaciones de conteo en todo el sur de Ábaco, seguido de estudios sistemáticos de anidación mediante transectos a pie. Utilizaré datos obtenidos por teledetección para analizar los factores paisajísticos que determinan la selección de los lugares de anidación, incluyendo la proximidad a hábitats críticos no reproductivos, la estructura forestal, el historial de incendios y las características geológicas. Se utilizó LiDAR terrestre para recopilar métricas sobre la estructura forestal alrededor de las cavidades de los nidos. Las tasas de reutilización de los sitios de anidación históricos fueron significativamente más bajas de lo esperado, probablemente debido al crecimiento excesivo del sotobosque por la falta de incendios en la zona de anidación en los últimos años. Los resultados preliminares ya han dado lugar a medidas de gestión para restaurar el hábitat de anidación y a esfuerzos de control de depredadores.

Session: Plant/Animal/Bird Interactions

Monarch Caterpillars Under Stress: Cannibalism and Predation on Tropical Milkweed

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Abstract: Butterfly enthusiasts often plant milkweed to support monarch butterflies (Danaus plexippus). In South Florida, however, the nonnative tropical milkweed (Asclepias curassavica) is the predominant option available at nurseries, with few exceptions. Tropical milkweed has smaller leaves compared to the native common milkweed (Asclepias syriaca), and monarch caterpillars may resort to cannibalism when food resources become scarce. Additionally, caterpillars may face predation from nonnative lizards patrolling butterfly gardens.
In this study, tropical milkweed was arranged in both low-density and high-density patches, with an equal number of caterpillars placed in each. Video cameras were deployed to document caterpillar behavior and predation events. Two experiments were conducted: one allowing caterpillars to interact with natural predators, and another excluding predators using netting. Monarch caterpillars in low-density patches exhibited high levels of cannibalism, whereas no cannibalism occurred in high-density patches. These findings suggest that monarch caterpillars experience a Malthusian trap, where cannibalism increases under resource scarcity. Although predation was infrequent, caterpillars in low-density patches suffered significantly greater losses compared to those in high-density patches. Plant density appears to influence

both cannibalism and vulnerability to predators. This study highlights the utility of video cameras for remotely documenting monarch caterpillar behavior and predation events.

Session: Insects of the Caribbean

A Life-history Trilogy Involving Cassiopea jellyfish, a Cerithid Snail, and Atlantic Lugworms in the Turks and Caicos Islands

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Abstract: While researching life history stages of the 'upside-down jellyfish' (*Cassiopea xamachana*), we discovered a remarkable, inquiline symbiosis involving a Cerithid snail, egg-masses from Atlantic Lugworms (*Arenicola cristata*), and the jellyfish. The jellyfish life history intersects that of the Lugworm twice, once as their planula larvae anchor and develop into polyps on the shells of a cerithid snail grazing over the annelid egg masses, and a second time as the medusoid ephyra return to settle on these same gelatinous orbs. It is remarkable that in a habitat rich in 'preferred' settlement substrate (decaying mangrove leaves), the larvae of this jellyfish seem overwhelmingly attracted to shells of this particular snail. It may be significant that many of the snails were encrusted with a calcareous algal biofilm, and that the snails were commonly observed grazing the surface of lugworm egg masses. It is also intriguing that, following metamorphosis and transition from polyp to medusa, young ephyra also seem attracted to the lugworm egg mass as a site for settlement as they begin the photosynthetic stage of their lives. We discuss this curious intersection of life histories across three animal phyla, and highlight the potential for investigating environmental settlement cues of the upside-down jellyfish.

Session: Marine Research in the Caribbean

Surveillance for Urban Mosquitoes as Potential Disease Vectors Across Caribbean Seaports

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Abstract: Urban centers throughout the Caribbean are vulnerable to mosquitoes due to climatic and demographic circumstances. From 2018-2025 we conducted standardized field surveys of 3 hours in the morning involving two-person teams sampling standing water for larvae and diverse microhabitats for adults. Surveys were conducted in residential and commercial centers near seaports where human and cargo traffic is high. Mosquitoes were identified microscopically then discarded on site. We surveyed 23 sites on 21 islands and 1 mainland seaport. Breeding populations of *Aedes aegypti* occurred in 7 urban areas: George Town, Cayman Islands; Roatan, Honduras; San Juan, Puerto Rico; Road Town, Tortola, British Virgin Islands; Charlotte Amalie, St. Thomas, U.S. Virgin Islands; Basseterre, St. Kitts; and Costa Maya, Mexico. Some Culex sp. were found in St. Thomas USVI. We found no mosquitoes in 13 sites despite multiple visits to some: Bahamas (3 islands); Haiti; Mexico; Sint Maarten; Saint Martin; Aruba; Bonaire; Curaçao; Antigua; St. Lucia; Barbados. We are examining 3 sites in Bahamas, Dominican Republic, and Turks and Caicos in November 2025. Larvae occurred in street drains, water meter wells, flowerpots, decorative fountains, rubbish cans, and automobile tires. Mosquitoes were abundant near dense human populations, thus constituting high risk for disease transmission.

Session: Insects of the Caribbean

Ecological Resilience at Bugby Hole: Early Research on Severely Impacted Stream Systems Due to Volcanic Activity on the Island of Montserrat

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Abstract: The island of Montserrat has suffered significant ecological disruption due to the Soufriere Hills Volcano. The volcano began erupting in 1995 with major events continuing through 2010, and continues to be active today at a low level. After a major eruption in 2010 the island was bisected by pyroclastic and lahar flows. The two largest river systems on the island were buried under over 40' of ash and lahar deposits, while the headwaters to those systems remained flowing. Here we present early research on one of those headwater systems known as Bugby Hole, which continues to be landlocked. In particular, we report on anadromous fauna that continue to persist in that system.

Session: Soil and Freshwater research in the Caribbean

Discovering the Hidden Life on an Endemic Cuban Owl

Descubriendo la vida oculta de un búho endémico de Cuba

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Abstract: The Bare-legged Owl (*Margarobyas lawrencii*) is one of the four endemic Strigidae species of the Insular Caribbean, endemic to Cuba and the sole member of the genus Margarobyas. The information gathered about the species has been scarce, without considerable variation since the first contributions made in the mid-19th century. Therefore, the objective of the study was to provide new data on the natural history of the Bare-legged Owl. Ecological data was collected in the municipality of San Cristóbal, Artemisa province, where aspects of behavior, nests, and diet were gathered through pellets and scattered material. Surveys were used to assess general knowledge about the species in rural and urban communities. The diet included species from six insect orders and two arachnid orders, marking the first time its pellets have been studied and a list of prey species has been compiled. The nests had average measurements of 216 mm in length, 157 mm in width, and 290 mm in distance from the immediate ceiling, respectively. Rural communities, specifically men, demonstrated greater knowledge about the bird. The use of caves as a niche is highlighted due to the ecological advantages they provide.

Resumen: El sijú cotunto (*Margarobyas lawrencii*) es una de las cuatro estrigídeas endémicas del Caribe Insular, endémico de Cuba y único miembro del género Margarobyas. La información recopilada respecto a la especie ha sido escasa, sin variarde forma considerable desde los primeros aportes realizados desde mediados del siglo XIX, por lo que el objetivo del estudiofueproporcionarnuevos datos sobre la historia natural del sijú cotunto. La toma de datos ecológicos se realizóen el municipio San Cristóbal, provincia Artemisa,donde se recopilaronaspectos de conducta, nidos y dieta mediante egagrópilas y material disperso. Se emplearon encuestas para evaluar el conocimiento generalrespecto a la especie en comunidades rurales y urbanas.En la dietase identificaron especies de seis órdenes de insectos yde dos órdenes de arácnidos, siendo la primera vez que son estudiadas sus egagrópilas y que se confecciona una lista de especies depredadas. Los nidos tenían 216 mm, 157 mm y 290 mm como medidas promedio de largo, ancho y de distancia respecto al techo inmediato, respectivamente. Las comunidades rurales presentaron un mayor conocimiento sobre el ave, específicamente los hombres. Se destacael uso de cuevas como nicho debido a las facilidades ecológicas que les propician.

Session: Caribbean Ornithology II

Effect of Rainfall on the Phenology of the Endangered *Aristida portoricensis* L. (Poaceae) in Puerto Rico

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Abstract: A one-year phenological study was conducted on *Aristida portoricensis*, an endangered bunchgrass endemic to the serpentine and clay soils of western Puerto Rico. Limited knowledge of its reproductive biology has hindered conservation efforts. This study monitored five phenophasesand applied Generalized Linear Mixed Models (GLMMs) to evaluate lagged relationships with precipitation. Results revealed a modular and asynchronous phenological system, in which individual culms progressed through phenophases independently throughout the year. All phenophases were observed year-round, with varying monthly averages. These findings demonstrate that *A. portoricensis* operates under a complex, rainfall-modulated yet non-seasonal reproductive strategy, offering critical insights to guide the timing of conservation interventions, seed collection, and management for this threatened endemic grass.

Session: Climate Response Research in the Caribbean

Investigating the Pollinators of Two Caribbean Endemic Plants in Montserrat

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Abstract: With small island ecosystems being especially vulnerable to the increasing threats arising from anthropogenic change, understanding the ecological relationships of understudied endemic species is valuable for conservation. This study documents the pollinators of the herb *Lobelia cirsiifolia/digitalifolia* complex (Campanulaceae) and the tree *Miconia purpurea* (Melastomataceae), both endemic to the Lesser Antilles. We observed both plants on the island of Montserrat in person and with camera traps. Field observation showed that both plants are bird-pollinated. *L. cirsiifolia/digitalifolia* was visited by *Orthorhyncus cristatus* (Antillean crested hummingbird), which also robbed nectar. Though flowers were open and producing nectar at night, we observed no nocturnal pollinators. *M. purpurea* was visited by *O. cristatus*, *Eulampis jugularis* (Purple-throated carib), *Coereba flaveola* (Bananaquit), the endemic *Icterus oberi* (Montserrat oriole), and the invasive *Rattus rattus* (Black rat). We compared the corolla lengths of the two plants with the culmen lengths of their avian pollinators: all culmens of the pollinators of *M. purpurea* were longer than the corolla, but the bill of *O. cristatus* was found to be shorter than the corolla of *L. cirsiifolia/digitalifolia*. All pollinators are locally common, which may indicate that their pollination relationships are currently stable.

Session: Botany of Montserrat

Tiny Frogs Big Questions: Factors influencing distribution of the endangered Coquí Llanero (*Eleutherodactylus juanariveroi*) in a coastal freshwater wetland

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Abstract: *Eleutherodactylus juanariveroi* (Coquí Llanero) is a federally listed endangered species of coquí frog endemic to Puerto Rico. Known from only three isolated populations in fragmented wetlands along the northern coast of the island, we aimed to answer the question of why are these frogs here? And what environmental factors contribute to their distribution? Using extensive field surveys on the Arecibo population, in 2024, we asked which component of habitat suitability, framed as alternate microclimatic covariate, vegetation composition, or mix covariate hypotheses, exerted greater influence on Coquí Llanero occupancy and local colonization and extinction probability, our proxy of movement. Multi-season occupancy models indicated that variation in initial occupancy, and local colonization and extinction rates was best explained by vegetation community covariates supporting the vegetation hypothesis. We surmise that population dynamics at the station level were mainly driven by reproduction and mortality rather than emigration/immigration as our findings suggested that the absence of plant species used for vital activities could represent effective barriers to movement. While high local abundance and genetic diversity are indicators of resiliency, poor dispersal coupled with current and historically altered landscapes appears to be a main impediment to recovery.

Session: Frogs of the Caribbean

Population Ecology of Marine Benthic Invertebrates at Lighthouse Reef Atoll, Belize

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Abstract: We examined the population ecology of marine benthic invertebrates at Lighthouse Reef Atoll, a coral atoll ~80km from the mainland of Belize, characterized by extensive seagrass meadows, patch reefs, and sand flats. Invertebrate fisheries—particularly for *Aliger gigas* (Queen Conch) and *Holothuria mexicana* (Donkey Dung Sea Cucumber)—play important ecological and economic roles in Belize, which motivated our efforts to understand their distribution patterns across the reefscape. We developed a custom-built, low-cost tow-camera system using an action camera housed in a hydrodynamic casing deployed from small boats and kayaks. This approach allowed us to collect over 20 km of continuous imagery across four habitat types: seagrass, coral, sand, and rubble. We manually identified benthic invertebrates and trained an AI model, developed by the IRSC at Wake Forest University, to automate *L.*

gigas detection. Using these data, we analyzed species distributions and co-occurrence patterns at the reefscape scale, providing new insights into habitat associations and spatial structure of ecologically and economically significant invertebrate populations in Belizean atolls.

Session: Marine Research in the Caribbean

Communal Nesting among Caribbean Reptiles

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Abstract: Communal nesting is common and widespread, but far from ubiquitous, in reptiles. It is most common in lizards and turtles, but also occurs in snakes, crocodilians and the tuatara. There are many hypotheses for why reptiles nest communally, including the limited nest site hypothesis and adaptive hypotheses involving benefits for mothers, eggs or hatchlings. For example, communally-nesting mothers can save time or energy or increase survival by copying the choices of conspecific mothers, or communal nests can dilute predation risk to eggs or hatchlings. Here I summarize the (known) presence of communal nesting in Caribbean reptiles. For context, I discuss the relevant natural history of each species and discuss the evidence for why those species nest communally. Finally, I discuss knowledge gaps and directions for future research.

Session: Reptiles and Snakes of the Caribbean

Assessing Health and Reproduction of Blainville's Beaked Whales in The Bahamas

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Abstract: Capture–mark–recapture methods are essential tools in population ecology for estimating abundance and guiding conservation management. We applied this approach to assess the abundance and health of Blainville's beaked whales (*Mesoplodon densirostris*) inhabiting the 1,500-km² U.S. Navy Atlantic Undersea Test and Evaluation Center (AUTEC) range in The Bahamas. Naval testing with mid-frequency active sonar is known to displace whales and disrupt foraging, raising concern for reproductive females with high energetic demands. We also used a hexacopter equipped with a laser altimeter to collect vertical images for morphometric measurements. From 224 identifications obtained during 63 encounter days (2005–2019), we documented 69 marked individuals. Despite multi-year site fidelity, annual capture probability was low (0.31, 95% HPDI = 0.13–0.71), and apparent survival (0.86, 95% HPDI = 0.76–0.96) suggests possible emigration. Estimated annual abundance averaged 35 whales (95% HPDI = 22–54). Over 40 drone flights produced >2,000 photogrammetry images, allowing derivation of body condition indices and pregnancy assessments validated by hormone and photo-ID data.

Calf length increased from 48% to 69% of maternal length within 11 months, while Body Area Index declined in lactating females with calf age. These results highlight the value of aerial photogrammetry for assessing reproductive health and the need for continued monitoring and effective mitigation of naval activities.

Session: Advances in Marine Mammal Conservation Science in the Wider Caribbean Region

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Activity Patterns of The Critically Endangered Hicatee (*Dermatemys mawii*)

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Abstract: *Dermatemys mawii*, known as the Hicatee in Belize, is a critically endangered species native to Mexico, Guatemala, and Belize. This species is widely reported to be nocturnal, but its diel and seasonal activity patterns have never been quantified. Therefore, we equipped 24 Hicatee with archival dataloggers to record acceleration (movement), temperature, and pressure (water depth). Over the course of six sampling trips occurring from June 2021 to July 2022, we recaptured and downloaded data from 18 individuals inhabiting a series of riverine pools in northwestern Belize. Our results indicate that Hicatee exhibit a crepuscular activity pattern, with the smallest rates of activity occurring at night. Overall, males were more active than juveniles, which were more active than females. Additionally, we observed greater levels of nocturnal activity in the rainy season and higher levels of diurnal activity during the dry season in both males and females. Temperature was negatively correlated with activity, and depth was positively correlated. Additionally, females spent more time at greater depths than males or juveniles, and all three demographic groups spent more time in deeper water during the dry season. These results broaden our understanding of Hicatee ecology and will aid in future research and conservation efforts.

Session: Ecology and Conservation of the Central American River Turtle (*Dermatemys mawii*)

Extraction and analysis of the macroscopic and microscopic characteristics of Cuban crocodile semen (*Crocodylus rhombifer*)

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Abstract: *Crocodylus rhombifer* is one of the four species of its genus that inhabit the Americas. It is endangered, with a limited geographical distribution restricted to the Zapata Swamp. It reproduces naturally in captivity, but it is necessary to initiate assisted reproduction programs to contribute to its conservation. In crocodiles, assisted reproduction has already shown initial results, but there is still a need

to explore and expand studies related to the methods of semen collection, analysis, and freezing. The first step is to develop efficient semen collection techniques, with our goal being to standardize the seminal extraction protocol (capture, containment, and semen collection) and the analysis of the macroscopic and microscopic characteristics of Cuban crocodile semen in sexually mature and clinically healthy donor individuals. It was possible to obtain ejaculate through a minimally invasive massage technique under the provided environmental conditions, where the semen obtained was of a viscous consistency and homogeneous milky coloration. With this, we took the first steps and managed to achieve the expected results, which allows us to standardize the semen collection technique in the Cuban crocodile under our management conditions and to make a microscopic and macroscopic description of the collected material.

Session: Crocodylians of the Caribbean, Plus Fossil Primates

What Makes a Hammock a Hotspot? Migratory Bird Habitat Preferences in Urban South Florida

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Abstract: Migratory songbirds are declining at alarming rates across North America as urbanization and other human land uses continue to reduce available habitat. In southeastern Florida, a region transformed from wilderness to urban metropolis in just a century, remaining forest fragments provide critical stopover habitat for migrating birds. This study assessed neotropical migrant habitat use in urban rockland hammock fragments across Miami-Dade County using bird point count surveys at 32 plots across fifteen sites. I examined relationships between migrant species richness and habitat characteristics, including vegetation structure, plant richness, surrounding urbanization, and fruit resources. Linear models revealed that inland hardwood hammock fragments surrounded by a lower percentage of urban landcover, in addition to increased fruit availability and plant richness, supported higher fall migrant richness. These results suggest that urban forest fragments can provide valuable habitat for migratory birds when they maintain high plant diversity and seasonal food resources.

Session: Plant/Animal/Bird Interactions

Closing distribution gaps of *Crocodylus acutus* across the Caribbean slope and Central Guatemala

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Abstract: The American crocodile (*Crocodylus acutus*), distributed across 29 countries, faces significant conservation challenges, including local extirpations. Globally classified as Vulnerable by the IUCN and

listed under CITES Appendix I (2017), the species is considered Critically Endangered in Guatemala, where the National Council of Protected Areas (CONAP) assigns it to Category 1 due to fragmented populations, outdated information, and elevated extinction risk. Historical accounts, including the II Master Plan (2003–2007) for Izabal, report extremely reduced populations resulting from intensive extraction during the 1960s, yet no formal national studies existed until recently. In 2021, Corado-García conducted the first phase of a nationwide assessment on the Caribbean slope, targeting Río Dulce National Park, the Sarstoon River, and Bocas del Polochic Wildlife Reserve, yielding encounter rates of 2.13 crocodiles/km along 56.3 km. Most detections occurred in Bocas del Polochic, an area subjected to substantial anthropogenic pressures. Then, in 2024 surveys on the Southern Pacific slope revealed only 0.47 crocodiles/km and identified merely two wild populations, both outside protected areas. These findings underscore the urgent need for a comprehensive national evaluation of distribution, population structure, and threats. Ongoing efforts aim to define conservation and research priorities and support evidence-based planning in under-surveyed regions such as the Motagua River, Izabal protected areas, and the Gulf of Mexico region in Alta Verapaz.

Session: Crocodylians of the Caribbean, Plus Fossil Primates

Establishment of Native Woody Species in Degraded Tropical Dry Forests in the Cabo Rojo NWR, Boquerón, Puerto Rico

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Abstract: Tropical dry forests have been experiencing shifts in their community compositions due to altered disturbance regimes, non-native species introductions and changes in global climate patterns. Restoration efforts using a more diverse native plants have not been studied in detail on the island of Puerto Rico. We transplanted native shrubs and trees under two light treatments and focused on analyzing the effect shade might have on the establishment of native woody species transplants into the USFWS Cabo Rojo National Wildlife Refuge in Puerto Rico. For this, plants were planted in plots under 2 treatments: sunlit and shaded plots. Plants were observed for a period of 10 years, a comparison of ground basal diameter and plant height for pre transplant data was carried out. Results showed that shaded plots had higher survivorship of transplants. Species identity was important. Paired t-test showed an average increase in growth on both plant height and basal stem diameter for surviving individuals. These results, expand the number of native species that can be used for passive restoration. An additional consideration can be the addition of water at critical stages, which can mitigate the effects of drought and transplant shock and provide greater success in future restoration projects.

Session: Caribbean and Bermuda Botany

Ant Communities and Their Foraging Patterns in the Northern Karst Region of Puerto Rico

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Abstract: Ants play vital roles in ecosystems by aiding in organic matter decomposition, enriching soil, contributing to environmental cleanliness, regulating insect populations as biological control agents, and serving as bio indicators of habitat conditions. While at least 90 ant species have been described on the island, an exact count remains undetermined. Limited documentation exists on the foraging preferences of ant species in the northern karst region of Puerto Rico. To address this gap, we conducted a baiting survey using four bait types across five different habitats in Las Coccolobas Natural Reserve, Utuado. Six diurnal and three nocturnal surveys were conducted between March 2024 and February 2025, yielding 1,341 recorded individuals. The "Mogotes" hillside exhibited the highest abundance (453 individuals), whereas the cacao plantation had the lowest (158 individuals). A total of 18 species were identified, including the first report of *Nylanderia semitincta* outside its previously documented range. These findings expand knowledge on ant species distributions and foraging behaviors in Puerto Rico's karst ecosystems, emphasizing their ecological significance and the need for further research on their habitat dynamics.

Session: Insects of the Caribbean

The sperm whale families of Dominica

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Abstract: Sperm whales are a cross-border species of concern whose distribution covers all of the Lucayan and Caribbean archipelagos. Through thousands of hours of fieldwork, research based out of Dominica has focused on over 30 sperm whale units which inhabit the waters of the Eastern Caribbean with a focus on their acoustics, social structure, habitat use, genetics, and anthropogenic impacts. In this presentation, Shane will summarize findings across two decades and outline future research and conservation actions.

Session: Advances in Marine Mammal Conservation Science in the Wider Caribbean Region

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Assessment of Artificial Oyster Reef Health based on Water Quality, Oyster Recruitment, and Perkinsosis Infection in Tampa Bay

Evaluación del estado de salud de los arrecifes artificiales de ostras en la bahía de Tampa, basada en la calidad del agua, el reclutamiento de ostras y la infección por Perkinsosis

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Abstract: Oysters are dominant reef builders within brackish habitats of the Gulf of Mexico and the wider Caribbean. Oysters filter water, sequester carbon, and provide structure for several species in these estuarine environments. Enhanced by anthropogenic actions, oysters have suffered from climate change, pollution, and overharvesting. Here, artificial oyster reefs are being monitored for one year across three sites in Tampa Bay, FL: Lassing Park (LAS), Maximo Park (MAX), and Abercrombie Park (ABE). Monitoring efforts include assessments of water quality, shell metrics, Perkinsosis disease, and recruitment. Weekly water quality monitoring is conducted using a multiparameter sonde; biweekly shell heights and densities are measured using calipers and quadrats; monthly disease monitoring is examined using the Ray's fluid thioglycollate medium method; and monthly recruitment is tracked using Florida Fish and Wildlife's Oyster Integrated Mapping and Monitoring Program (OIMMP) methods. Environmental extremes include maximum recordings of 36.5ºC (temperature) and 33.6ppt (salinity). Initial data shows different average shell heights among the sites: 74.2mm (ABE), 61.8 (LAS), and 49.5mm (MAX). Furthermore, all three reefs showed signs of biological stress, with varying rates of Perkinsosis infection (average of 45.8 gill hypnospores across all sites). Recruitment peaked in September with an average of 8.7 spat per 28-days ±9.1.

Resumen: Las ostras son los principales constructores de arrecifes en los hábitats salobres del Golfo de México y el Caribe. Filtran el agua, secuestran carbono y proporcionan estructura a diversas especies en estos entornos estuarinos. Debido a la actividad humana, las ostras se han visto afectadas por el cambio climático, la contaminación y la sobreexplotación. En este estudio, se monitorean arrecifes artificiales de ostras durante un año en tres sitios de la Bahía de Tampa, Florida: Lassing Park (LAS), Maximo Park (MAX) y Abercrombie Park (ABE). El monitoreo incluye evaluaciones de la calidad del agua, características de las conchas, la enfermedad de Perkinsosis y el reclutamiento. La calidad del agua se monitorea semanalmente con una sonda multiparamétrica; la altura y densidad de las conchas se miden quincenalmente con calibradores y cuadrantes; la enfermedad se monitorea mensualmente con el método del medio de tioglicolato de Ray; y el reclutamiento mensual se registra con los métodos del Programa Integrado de Mapeo y Monitoreo de Ostras (OIMMP) del Departamento de Conservación de Pesca y Vida Silvestre de Florida. Los extremos ambientales incluyen registros máximos de 36,5 °C (temperatura) y 33,6 ppt (salinidad). Los datos iniciales muestran diferentes alturas promedio de concha entre los sitios: 74,2 mm (ABE), 61,8 mm (LAS) y 49,5 mm (MAX). Además, los tres arrecifes presentaron signos de estrés biológico, con tasas variables de infección por Perkinsosis (un promedio de 45,8 hipnosporas branquiales en todos los sitios). El reclutamiento alcanzó su punto máximo en septiembre, con un promedio de 8,7 larvas cada 28 días ± 9,1.

Session: Invertebrates in the Gulf of Mexico: Responses to Anthropogenic Influences

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Preliminary results: morphological and reproductive evaluation of the Shiny Cowbird (*Molothrus bonariensis*) in southern Puerto Rico

Resultados preliminares: evaluación morfológica y reproductiva de *Molothrus bonariensis* (Tordo lustroso) en el sur de Puerto Rico

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Abstract: *Molothrus bonariensis* (Shiny Cowbird) is a generalist species that arrived naturally in Puerto Rico around 1950 and has since been considered invasive. On the island, it mainly occupies open areas and exerts a significant ecological impact through brood parasitism, particularly affecting endemic bird species. The objective of this study is to evaluate the morphology and reproductive phenology of the Shiny Cowbird in Puerto Rico. A control trap was placed at the agricultural station in the municipality of Lajas and checked weekly during September and October of the current year. Each captured bird was euthanized and stored in a freezer. For each specimen, morphometric variables were recorded, and body condition was categorized based on keel prominence and muscle development. In addition, macroscopic gonadal condition was assessed, and a body mass index (BMI) was calculated. A total of 78 individuals (37 males and 41 females) were captured in this study. Males were larger and heavier than females, and individuals with higher BMI exhibited greater muscle development. Regarding reproductive status, 8% of males and 27% of females showed gonadal activity. The results reflect sexual dimorphism in the analyzed morphometric characteristics and a direct relationship between body condition and reproductive activity.

Resumen: *Molothrus bonariensis* (Tordo lustroso) es una especie generalista que llegó naturalmente a Puerto Rico alrededor de 1950. Desde entonces ha sido considerada invasora. En la Isla ocupa mayormente áreas abiertas y ejerce un impacto ecológico importante por su parasitismo de cría, afectando particularmente aves endémicas. El objetivo es evaluar morfología y fenología reproductiva del Tordo Lustroso en Puerto Rico. Se colocó una trampa de control en la estación agrícola del municipio de Lajas, revisada semanalmente durante septiembre y octubre del presente año. Cada ave capturada fue eutanasiada y conservada en congelador. Para cada espécimen se documentaron variables morfométricas, condición corporal categorizada según prominencia de quilla y desarrollo muscular. Además, se evaluó el estado gonadal macroscópico y se calculó el índice de masa corporal (IMC). Un total de 78 individuos (37 machos y 41 hembras) fueron capturados en este estudio. Los machos fueron más grandes y pesados que las hembras, los individuos con mayor IMC presentaron mayor desarrollo muscular. En cuanto al estado reproductivo, el 8% de los machos y 27% de las hembras mostraron actividad gonadal. Los resultados reflejan dimorfismo sexual con respecto a las características morfométricas analizadas y una relación directa entre condición corporal y actividad reproductiva.

Session: Caribbean Ornithology I

Fossil Caribbean Primates Exhibit Locomotor Repertoires Unique Among Platyrrhines

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Abstract: The Greater Antilles was once home to several radiations of now extinct endemic monkeys. Fossils from Jamaican (*Xenothrix mcgregori*) and Cuban (*Paralouatta spp.*) monkeys exhibit peculiar morphological characters suites indicative of locomotor repertoires unique among platyrrhines. The island of Hispaniola was once inhabited by at least two primate taxa, *Antillothrix bernensis* from the eastern Dominican Republic, and *Insulacebus toussaintiana* from western Haiti. Postcranial material from extinct Hispaniolan primates has remained elusive until relatively recently with additional exploration of cave sites in the eastern and western Dominican Republic. Here, we describe two primate femora from Padernales Provence, the Dominican Republic, a biogeographically important region that sits at the intersection of the two paleoislands that form present-day Hispaniola. Additionally, we assess femoral shape and size variation in Caribbean primates (n=7) as well as a large comparative sample of extant platyrrhines (n=115 individuals; n= 14 species) using landmark-based 3D geometric morphometrics. This approach accurately separated platyrrhines both phylogenetically and along the lines of locomotor pattern. We found quantitative support that the Padernales primates and other Caribbean primates possess novel femoral morphologies not seen in any present day platyrrhines. This complicates functional inferences and suggests Caribbean primate radiations faced unique conditions following their dispersal.

Session: Crocodylians of the Caribbean, Plus Fossil Primates

Advances in the moss flora of Montserrat

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Abstract: The moss flora of Montserrat, West Indies, is relatively unknown. Past botanical research on Montserrat has focused primarily on tracheophytes, most notably Richard A. Howard's Flora of the Lesser Antilles. Due to the historic focus on tracheophytes, bryological collections from the island have been limited both in quantity and geographically. Historically, the best collected area for mosses was in the vicinity of the former capital, Plymouth, especially the slopes of Chance's Peak. This area was also devastated by the current period of volcanic activity which began in 1995, and it is still inaccessible. Until 2022, only three known collections were made outside the modern-day exclusion zone. The research we present here synthesizes a literature review, examination of herbarium records, and additional specimen collection. The collections in the herbaria of The New York Botanical Garden, University of Cincinnati, and Missouri Botanical Garden were especially valuable. The current checklist for Montserrat mosses is comprised of 57 species, six of which were not previously reported for Montserrat.

Session: Botany of Montserrat

Home range and spatial ecology of the White-lipped Mud Turtle (*Kinosternon leucostomum*) in Belize

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Abstract: Understanding movement patterns of freshwater turtles is essential for effective conservation planning. We studied the White-lipped Mud Turtle (*Kinosternon leucostomum*), a widespread Central American species whose movement ecology has been described only once before, in an ephemeral lake in Veracruz, Mexico. Our goal was to describe its home range and spatial ecology in a permanent montane creek system in Stann Creek District, Belize. Between 2015 and 2024, we radio-tracked 41 adults (23 females, 18 males) in creeks and seasonal wetlands and recorded aquatic and terrestrial locations. We calculated curvilinear home ranges, core activity areas, and annual overlap to assess site fidelity. Mean curvilinear range length was 429 m (range: 40–2,400 m), with no difference between sexes. Core activity areas averaged 87 m, and individuals tracked across years showed strong site fidelity, with an average 70% overlap of core ranges. Most turtles remained aquatic year-round, showing brief terrestrial movements within 20 m of creek margins, usually after heavy rainfall. Occasional longer movements by some individuals showed no consistent link to sex or precipitation. Compared to the Mexican population, *K. leucostomum* in this permanent system exhibited larger home ranges but similar site fidelity. Our results highlight the importance of riparian and floodplain habitat protection for *K. leucostomum* conservation.

Session: Freshwater Turtles of the Caribbean

Microplastic Contamination in Longfin Squid: Implications for Gulf of Mexico Food Webs

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Abstract: Microplastic contamination pervades marine ecosystems globally, yet its ecotoxicological consequences for cephalopods remain poorly understood. Cephalopods occupy critical positions within marine food webs as both predators and prey, making them ideal representatives for assessing microplastic pollution in coastal regions. This study quantified microplastic prevalence and distribution in *Doryteuthis pealeii* (Longfin squid), a species of significant economic and ecological importance in the Gulf of Mexico. This research establishes baseline contamination data for this region. Digestive tracts and mantle tissue were used to distinguish between ingested microplastics and potentially bioaccumulated

particles. Digestive tracts were digested using hydrogen peroxide, followed by vacuum filtration to isolate microplastics for quantification and morphological categorization. FTIR spectroscopy was used to identify plastic polymers present in the mantle tissues. Correlations between microplastic contamination and various biotic and spatial factors were evaluated using rigorous statistical analysis. Findings confirm that D. pealeii is contaminated with microplastics, establishing a baseline for monitoring future pollution trends. This dataset provides essential information for informed marine resource management decisions and the development of effective, targeted mitigation strategies within the Gulf of Mexico.

Session: Invertebrates in the Gulf of Mexico: Responses to Anthropogenic Influences

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Drier wet seasons and shifting seasonality of precipitation in the southern coast region of Belize

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Abstract: Climate is typically interpreted from large-scale models based on interpolated precipitation and temperature surfaces. Understanding local patterns is important though in the Neotropics, where there is considerable disagreement among large-scale models in the magnitude and direction of changes in climate. Therefore, we used precipitation data from eight climate stations in a 3,500 km2 region of southern Belize from 2001 - 2024 to evaluate: (1) changes in total annual and wet and dry season amounts; (2) changes in monthly distribution of precipitation; and (3) trends in monthly and annual variability. We first used multivariate autoregressive state space (MARSS) models to estimate missing values and aggregate daily data to monthly totals. Monthly totals converted to the Standardized Precipitation Index (SPI) at 1,3, and 5-year scales consistently pointed to the region being in a dry period since 2016. Bayesian GLMs indicated changes in dry season amount varied among stations, but there was a consistent downward trend in wet season amount. Seasonal decomposition analysis revealed peak wet season precipitation shifting to later in the season, while the consecutive disparity index D showed a 5-fold increase in variability at the regional scale and as much as a 10-fold increase in some local areas.

Session: Climate Response Research in the Caribbean

Hunting for MSY: Transient dynamics models and persistence of the Central American River Turtle

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Abstract: Overhunting has been identified as the main reason for *Dermatemys mawii* (Central American River Turtle) being one of the most endangered freshwater turtles in the world. Although it is legally hunted, there have been no attempts to estimate sustainable harvest rates (maximum sustained yield; MSY). Therefore, we used stage-based transient dynamics models (TDMs) to address three questions: (1) to what degree is mortality from hunting additive vs. compensatory; (2) how do demographic and environmental stochasticity influence persistence of *D. mawii* populations; and (3) what are recovery times of populations following cessation of hunting? Hunting was a strong additive mortality factor in all but the most lightly hunted model scenarios. Demographic stochasticity increased time to extirpation but not long run chance of persistence. Environmental stochasticity resulted in persistence over 100 years, but abundance was very low relative to initial population size. The long period of time it takes to reach the breeding stage (≈ 15 years) and high rates of mortality in egg and hatchling stages severely constrain recruitment in *D. mawii*. The TDMs indicate sustainable harvest rates should be based on intermittent periods (1 – 2 years) of low to moderate take and a maximum rather than minimum size limit.

Session: Ecology and Conservation of the Central American River Turtle (*Dermatemys mawii*)

The Lichens of Bermuda: Species Diversity, Endemism, and Dispersal in a Remote North Atlantic Archipelago

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Abstract: Bermuda's biodiversity is under threat from rapid development (approximately 16 acres of woodland is lost each year), as well as potential rising seas and stronger hurricanes due to climate change. To help raise awareness of Bermuda's lichen diversity, I manage a specimen-based virtual flora (http://bermudalichens.myspecies.info). Like its native plant flora, Bermuda's lichen flora comprises both eastern North American and Caribbean biogeographic elements. Extensive revision of historic specimens as well as examination of my own recent collections is providing an update of Bermuda's lichen flora for the first time in over 100 years, effectively doubling the number of lichens previously known from this remote, North Atlantic archipelago. I have recently documented a total of 208 lichens, including nine new to science. Most recently, I am conducting a molecular phylogeographic study of *Ramalina denticulata* to learn where this widely distributed lichen may have dispersed to Bermuda from. At least five lichen

species have been extirpated from Bermuda, and are only known from historic specimens. Factors affecting Bermuda's endemism and extirpation rates will be discussed, and a timeline of mycological and lichenological exploration of Bermuda will be presented.

Session: Caribbean and Bermuda Botany

Status and Community Structure of US Virgin Islands Freshwater Fauna

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Abstract: Streams in the U.S. Virgin Islands (USVI; St. Croix, St. John, and St. Thomas), known locally as "guts," have historically exhibited perennial flow, which has diminished in recent decades due to several factors. Anecdotal evidence suggests that these systems once supported diverse freshwater communities; however, no comprehensive survey has quantified their distribution. This lack of information limits conservation and management efforts, as all freshwater Species of Greatest Conservation Need (SGCNs) remain listed as data deficient. This study documents the status, habitat associations, and community structure of native freshwater fauna across 60 stream sites in the USVI. Field surveys assess the characteristics of instream habitat and anthropogenic barriers to identify factors influencing species occurrence and connectivity. Findings will provide a foundation for a freshwater connectivity plan and the first territory-wide synthesis of freshwater faunal distribution in the U.S. Virgin Islands.

Session: Freshwater Biodiversity in the Caribbean

Invaders and Imposters: Phylogeography of a Cryptogenic Frog in the Lesser Antilles

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Abstract: Cryptogenic species - species whose native and introduced ranges are unknown - pose a challenge to conservation. *Eleutherodactylus johnstonnei* (Lesser Antillean Coqui) is one such species, which has been introduced throughout the Caribbean islands and to mainland South America. Previous work identified two clades: a western Lesser Antillean clade native to Montserrat and an introduced clade whose native island is unknown. Fossil evidence suggests Barbuda as the potential native range for this clade. We investigated the genetic diversity and phylogenetic history of frogs on the islands of Antigua and Barbuda to determine if the introduced populations are native to these islands. We collected 42 specimens and sequenced the cytochrome b gene to construct a phylogeny and estimate genetic diversity.

We found high levels of genetic diversity on Antigua, supporting the hypothesis that this is the native range of the invasive clade. Additionally, genetic sequencing revealed the presence of *Osteopilus septentrionalis* (Cuban Tree Frog) - another non-native species - on Barbuda. These results have important implications for conservation efforts on these islands as well as understanding the factors influencing invasion potential and success in widely distributed species.

Session: Frogs of the Caribbean

Tough Crap: The Diet of the Durophagous Northern Giant Musk Turtle (*Staurotypus triporcatus*)

¡Qué asco!: La dieta de la tortuga almizclera gigante del norte durofágica (*Staurotypus triporcatus*)

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Abstract: Because dietary composition varies among populations, characterizing a species' diet requires sampling across its full range of habitats. Turtles are useful model organisms for diet studies due to their diverse ecological roles and trophic flexibility. The Northern Giant Musk Turtle (*Staurotypus triporcatus*), the largest member of the family Kinosternidae, inhabits a wide range of aquatic habitats and can enter terrestrial dormancy to survive dry periods. Limited studies of its diet suggest it is omnivorous but primarily carnivorous. To better understand this species' ecological role and trophic position, we quantified its diet in six populations inhabiting lagoons and rivers with varying turbidity. Dietary materials were obtained by collecting fecal material. Mussels, snails, and seeds from the palm family (Arecacea) were the most common diet components, but we also identified remains of iguanas, turtles, reptile eggs, and seeds from various tree families. Additionally, diet varied across populations and between sexes and size classes; however, we found no significant differences between wet and dry seasons. The species' diet was found to be more diverse than previously reported, and this dietary plasticity may facilitate its ability to inhabit a wide range of habitats.

Resumen: Debido a que la composición de la dieta varía entre poblaciones, caracterizar la dieta de una especie requiere el muestreo en toda su gama de hábitats. Las tortugas son organismos modelo útiles para los estudios de dieta debido a sus diversos roles ecológicos y su flexibilidad trófica. La tortuga almizclera gigante del norte (*Staurotypus triporcatus*), el miembro más grande de la familia Kinosternidae, habita una amplia gama de hábitats acuáticos y puede entrar en letargo terrestre para sobrevivir a los períodos secos. Estudios limitados sobre su dieta sugieren que es omnívora, pero principalmente carnívora. Para comprender mejor el rol ecológico y la posición trófica de esta especie, cuantificamos su dieta en seis poblaciones que habitan lagunas y ríos con diferente turbidez. Los materiales dietéticos se obtuvieron mediante la recolección de heces. Los mejillones, los caracoles y las semillas de la familia de las palmeras (Arecaceae) fueron los componentes más comunes de la dieta, pero también identificamos restos de iguanas, tortugas, huevos de reptiles y semillas de diversas familias de árboles. Además, la dieta varió

entre poblaciones, sexos y clases de tamaño; sin embargo, no encontramos diferencias significativas entre las estaciones húmeda y seca. Se descubrió que la dieta de la especie era más diversa de lo que se había informado anteriormente, y esta plasticidad alimentaria puede facilitar su capacidad para habitar una amplia gama de hábitats.

Session: Freshwater Turtles of the Caribbean

The adaptive radiation pupfishes endemic to San Salvador Island, Bahamas: genomics, craniofacial morphology, scale-biting, and fitness landscapes

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Abstract: Understanding the mechanisms of speciation and adaptation is a fundamental question in biology that also provides an opportunity to uncover new gene functions of clinical relevance. Highly conserved genetic regulatory pathways shared across diverse vertebrate species have been shaped by adaptive evolution to produce spectacular morphological, behavioral, and ecological diversity. Here I review a decade of my lab's work investigating the rapid evolutionary transition from generalist algae-eating pupfishes to trophic specialists endemic to hypersaline lakes of San Salvador Island in the Bahamas. We show that adaptation to these niches occurred in stages, beginning with selection on standing genetic variation for feeding behavior, then aided by adaptive gene flow from throughout the Caribbean, and ending with selection on de novo mutations in key craniofacial genes. We discovered that only 157 single-nucleotide polymorphisms (SNPs) and 87 deletions are fixed between scale-eating and molluscivore specialists despite extensive phenotypic divergence in their craniofacial morphology, metabolism, and behavior. These few differences resulted in major transitions in ecological niches and the colonization of new fitness peaks and novel performance optima for scale-biting. Overall, our work provides a new microevolutionary framework for investigating how major ecological transitions occur in nature.

Session: Freshwater Biodiversity in the Caribbean

Behavioural and Body Condition Variations Between Sexes of Juvenile *Crocodylus rhombifer* in Captivity

Variaciones conductuales y de la condición corporal en sexos de juveniles de *Crocodylus rhombifer* en cautiverio

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Abstract: The morphology and behaviour of one-year-old individuals of *Crocodylus rhombifer*, born and raised at Zapata Swamp Crocodile Farm, were analyzed to find sexual dimorphism among them. The sex of each individual was identified visually and we collected information about weight, total length, vent-snout length and tail circumference of each of them. 31 individuals of each gender were chosen and allocated in one pent. Their behaviour was recorded one hour in the morning during 19 days. We found differences in the lineal variables/weight index between sexes, and females showed the highest measurements of the three morphological variables sampled. They were not found differential behaviours between sexes when they were selecting the sampled resources. At the beginning of the observations, mostly of individuals of both sexes were found in sunny areas, and at the end in areas of shade and water. The highest number of agonist interactions were observed at the beginning of the observations during the sunshine and them decreased as temperature increased. We did no find differences to support the hypothesis of one sex is more aggressive than the other.

Resumen: Se analizó la existencia de dimorfismo sexual a partir del estudio de caracteres morfológicos y conductuales en individuos de *Crocodylus rhombifer* de un año de edad, nacidos y criados en el Criadero de Cocodrilos de la Ciénaga de Zapata. Se identificó el sexo de los individuos de manera visual y se colectó información sobre el peso, largo total, largo hocico-cloaca y circunferencia de la cola. Se seleccionaron 31 ejemplares de cada sexo y se colocaron en un encierro. Se recopiló información sobre su conducta durante una hora cada mañana por 19 días. Se encontraron diferencias, entre sexos, en relación con los índices medidas lineales/peso calculados y las hembras mostraron los valores mayores de las variables morfológicas estudiadas. No se encontraron diferencias en el comportamiento entre sexos en el uso de los recursos estudiados. Al inicio de las observaciones la mayoría de los individuos de ambos sexos se encontraron en zonas de asoleamiento y al final en áreas de sombra y agua. El mayor número de interacciones agonistas fueron observadas durante durante el período de asolamiento y disminuyeron con el incremento de la temperatura. No se encontraron diferencias que apoyen la hipótesis de la existencia de un sexo más agresivo.

Session: Crocodylians of the Caribbean

First Time Records of Tyrannochthonius and Lagynochthonius Pseudoscorpions (Family Chthoniidae) on the US and British Virgin Islands

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Abstract: Pseudoscorpiones de Geer, 1778 is a mesodiverse arachnid order (4,344 currently described species) found around the world in nearly every terrestrial habitat. While over 150 pseudoscorpion species

have been documented on Caribbean islands, there are still islands for which we know very little about their arachnid diversity and many undescribed species even on the larger and more heavily monitored islands. In an effort to further understand the evolutionary history of chthoniid pseudoscorpions on the Puerto Rican island shelf, we collected specimens from eight islands: Puerto Rico, Culebra, Vieques, St. Thomas, St. John, Tortola, Virgin Gorda, and St. Croix. We found undescribed species of Lagynochthonius on Culebra, Vieques, St. Thomas, St. John, Tortola, and Virgin Gorda and undescribed species of Tyrannochthonius on Puerto Rico and St. Croix. This is the first time either of these genera have been recorded from the U.S. or British Virgin Islands. This work highlights the need for more focused taxonomic work on Caribbean pseudoscorpions and other small understudied invertebrates.

Session: Insects of the Caribbean

An overview of the history of plant collecting on Montserrat, West Indies

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Abstract: Like many islands of the Lesser Antilles, Montserrat does not have a separate, comprehensive floristic treatment. Though its area is relatively small (102 km2), Montserrat has a wide range of habitats due to its elevation ranging to 1,050 m. Consequently, Montserrat's plant species richness (about 1,200 species) is comparable to larger islands like Dominica (772 km2; 1,226 species). Since 2016, I have worked on the Montserratian flora and found that relatively few specimens exist. Here I outline the history of plant collecting on Montserrat. Prior to the reactivation of the Soufrière Hills Volcano in 1995, most collecting occurred around Plymouth and in the Soufrière Hills. In the 21st century, collecting has been limited to the northwestern half of the island. In the 18th century, collecting was fairly active, and many important specimens were collected including several types. There was a dearth of collecting in the 19th century, and collecting picked up again in 20th century when John Shafer, Richard Howard, George Proctor, and David Brussell collected on the island. In 2005 and 2006, researchers from Royal Botanic Garden, Kew collected in the Centre Hills. Beginning a decade ago, I have led a general collecting effort throughout accessible areas of Montserrat.

Session: Botany of Montserrat

They really do move in herds: Evidence of group living in Central American River Turtles

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Abstract: Sociality is a key aspect of the ecology of many species, and it has important implications for conservation. Nevertheless, research on vertebrate sociality has focused predominantly on mammals and birds, while reptiles have been largely neglected. Here we present some of the first evidence of group living in freshwater turtles outside of resource use or reproduction contexts. We monitored the movements of clusters of juvenile Central American River Turtles (*Dermatemys mawii*) and used simulations to compare our results to the null hypothesis of no social association. We found that turtles moved together non-randomly and formed tighter clusters than would be expected by chance. Indeed, in several cases, two juveniles were monitored moving closely together, apparently following one another. This work was conducted in an area with uniform habitat and little or no structure, and the results cannot adequately be explained by habitat selection, foraging behavior, or mating behavior. This leaves social clustering (i.e., group living) as the most parsimonious interpretation. This suggests that turtles are more social than generally assumed and expands our understanding of the contexts and taxa in which sociality arises.

Session: Ecology and Conservation of the Central American River Turtle (*Dermatemys mawii*)

Differences in Secondary Consumer Behavioral Responses to Predators on Natural and Artificial Reefs in South Florida

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Abstract: Intensifying local stressors and climate change reconfigure reef ecosystems, with largely unknown implications for critical ecosystem functions (i.e., predation and secondary consumption). This study investigated differences in fish assemblages by reef type and how predator presence affects secondary consumer abundance and foraging behaviors on natural versus artificial reefs in South Florida. Objectives were to determine whether secondary consumer abundances differ between reef types and assess how predator identity influences foraging behavior. Fish community surveys measured species abundance and standardized “squidpop” assays in conjunction with predator treatment quantified fear effects. We tested behavioral responses across four threat treatments: a *Mycteroperca bonaci* (Black Grouper) model, a *Sphyraena barracuda* (Great Barracuda) model, an object control, and a control. Natural reefs supported significantly greater fish abundances and differing species communities than artificial reefs. Foraging activity differed between reef types; however, the exact mechanism driving this pattern remains unknown. Fish perceive a difference between predator treatments, with more perceived risk to the grouper model, suggesting predator identity impacts secondary consumer foraging. Enhancing structural complexity on artificial reefs may support diverse fish communities and natural predator-prey interactions. Future research should explore habitat features that optimize foraging and defense, boosting fish resilience and the marine ecosystem.

Session: Fishes of the Wider Caribbean

Coral reef education: Training the next generation

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Abstract: Degradation of Caribbean coral reefs is well-documented. Recruitment of personnel is vital for sustaining efforts to identify, understand, and combat the environmental and anthropogenic pressures facing reefs. For ~20 years, Berry College has provided undergraduate college students with opportunities to study Caribbean reefs in Belize, Roatan, and Costa Rica. These educational opportunities enable students to develop appreciation for coral reefs, provide an opportunity to participate in reef restoration, and expand an understanding of the complex threats facing coral reefs. This presentation will identify positive contributions and challenges faced when providing these immersive experiences.

Session: Marine Research in the Caribbean

Freshwater and Diadromous Fishes of Puerto Rico: A Free Resource for the Caribbean

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Tom Kwak, USGS, North Carolina State University (Deceased)
Gus Engman, University of Tennessee
Craig Lilyestrom, Puerto Rico Department of Natural and Environmental Resources (Retired)
Lourdes Olmeda, Puerto Rico Department of Natural and Environmental Resources

Abstract: This presentation will explore a new book, *Freshwater and Diadromous Fishes of Puerto Rico*, which was published in 2025 and explores the diversity of native and introduced species on this Caribbean island. The book provides guidance on identification of fish species that are likely to be encountered in Puerto Rico's freshwater lagoons, rivers, streams, and reservoirs, including a comprehensive list of more than 50 native and non-native species from 22 families and a dichotomous key (Catalog of Fishes). Each species is presented with common names in English and Spanish, professional photographs, identifying characteristics, and information on the distribution, habitat, biology, similar species, and human value. It also presents information on history, conservation and management, habitat, and serves as a research compendium and bibliography. Although the main objectives of this book are to be a resource for identification of Puerto Rico's freshwater fishes and to provide insight on their biology and ecology, it is also intended to increase awareness of the threats to Puerto Rico and other Caribbean ecosystems and their value to human populations. Freshwater and Diadromous Fishes of Puerto Rico is the first open access book published by the American Fisheries Society. The PDF can be downloaded for free and shared; the hardcopy is available for purchase.

Session: Fishes of the Wider Caribbean

Assessing the Central American river turtle population in Cox Lagoon, Belize: Four years of monitoring

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Abstract: The Central American river turtle (*Dermatemys mawii*) is a critically endangered species and the only living representative of its family. Once heavily exploited for food in Belize and across its range, the species has declined dramatically, raising concerns about its persistence in many aquatic systems. Cox Lagoon, a large wetland within the Maya Forest Corridor, was historically subjected to intense hunting, leading to doubts about the turtle's survival there. Between 2021 and 2024, we carried out standardized surveys using trammel nets to confirm the species' presence, describe its population structure, and assess trends under protection measures. Over the four years, we recorded more than one hundred individuals, including a significant proportion of juveniles, suggesting that Cox Lagoon functions as a nursery habitat. The results also revealed skewed sex ratios toward females and juveniles, and activity patterns peaking in late afternoon to evening, which refined survey strategies. Catch rates increased steadily, with 2024 showing the highest captures, a promising indication of stability and potential recovery. Furthermore, the introduction of acoustic telemetry has opened opportunities to study movement and habitat use, strengthening the scientific foundation for conservation planning. The findings highlight the importance of Cox Lagoon as a refuge for *Dermatemys mawii*, demonstrate the value of no-take zones with active enforcement, and provide a replicable model for freshwater turtle conservation. This work contributes vital knowledge for safeguarding one of the world's most endangered turtles and emphasizes the role of habitat protection and monitoring in the conservation of reptiles in Mesoamerica.

Session: Ecology and Conservation of the Central American River Turtle (*Dermatemys mawii*)

Carnivorous Queen Conch? *Aliger gigas* observed consuming Barracuda (*Sphyraena barracuda*) in short-term captivity

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Emma Boling, Hollins University, Virginia
Sofia Gonzalez, Wellesley College, Massachusetts
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Abstract: The gastropod, Queen Conch (*Aliger gigas*) is economically, ecologically and culturally important to the tropical western Atlantic, but due to overfishing, its populations are dwindling. Understanding its basic biology is of paramount importance to conservation and restoration efforts, and to recognizing its role in its ecosystem. In the course of testing Queen Conch responses to conspecific alarm cues, we unexpectedly observed multiple individuals consume Barracuda (*Sphyraena barracuda*) tissue

intended as a control treatment. Two subsequent controlled exposures of 10 juvenile Conch to Barracuda tissue in small enclosed pools resulted in 50% (n = 5) seemingly consuming it, and another 20% (n = 2) possibly consuming it. A search of the peer reviewed literature yielded no reports of carnivory in this species, only herbivory of algae and seagrass. Further observation and testing is needed to determine how widespread this behavior is and if the tissue is actually ingested. However, if this species regularly consumes animal tissue as these observations suggest, ecologists must update their understanding of the Queen Conch's role in the marine ecosystem and conservation and restoration initiatives must take this into account when designing management plans. In particular, conch hatcheries should consider supplementing the diets of their conch with animal tissue.

Session: Marine Research in the Caribbean

Trophic Ecology of *Dermatemys mawii* and its Relationship with a Fish Community in a Lentic Ecosystem of Southeastern Mexico

Ecología trófica de *Dermatemys mawii* y su relación con una comunidad de peces en un ecosistema léntico del sureste mexicano

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Abstract: Trophic ecology studies help to understand the relationships among species within a community and ecosystem, providing valuable information for conservation programs. The Central American river turtle (*Dermatemys mawii*) is one of the most threatened turtle species worldwide, and to date, only a few studies have focused on its trophic ecology. Based on stable isotope analysis ($\delta^{13}C$ and $\delta^{15}N$), we analyzed isotopic niche metrics, community-level metrics, and stable isotope mixing models to evaluate intraspecific variation in the isotopic niche of *D. mawii* across age and sex classes, interspecific relationships with dominant fish species, and the relative contribution of basal resources to selected aquatic consumers in a lentic system located within the Montes Azules Biosphere Reserve, Chiapas,

Mexico. The isotopic niche and community-level metrics suggested that juvenile *D. mawii* consumed a wider variety of food resources and accessed a broader range of habitats than adults, regardless of sex. Mixing models indicated that the aquatic macrophyte *Pistia stratiotes* was the main dietary source for adult females, while riparian plants were more important for juveniles and adult males, suggesting intraspecific niche partitioning. We also identified distinct energy pathways for *D. mawii* and the fish community, with turtles depending primarily on vascular plants (both riparian and aquatic) and fish relying mainly on seston. Our findings suggest that *D. mawii* may play a crucial role in nutrient cycling and potentially regulate the abundance of the floating macrophyte *P. stratiotes* at the study site.

Resumen: Los estudios de ecología trófica ayudan a entender las relaciones entre especies dentro de una comunidad y ecosistema, proporcionando información valiosa para los programas de conservación. La tortuga blanca (*Dermatemys mawii*) es una de las especies de tortugas más amenazadas a nivel mundial y, hasta ahora, solo unos pocos estudios se han centrado en su ecología trófica. Basándonos en el análisis de isótopos estables (δ13C y δ15N), analizamos el nicho isotópico, las métricas a nivel de comunidad y los modelos de mezcla de isótopos estables, para evaluar la variación intraespecífica en el nicho isotópico de *D. mawii* entre diferentes categorías de edad y sexo, las relaciones interespecíficas con especies dominantes de peces, y la contribución relativa de los recursos basales a consumidores acuáticos seleccionados en un sistema léntico ubicado en la Reserva de la Biosfera Montes Azules en el estado de Chiapas. El nicho isotópico y las métricas a nivel de comunidad sugirieron que los juveniles de *D. mawii* consumían una mayor variedad de recursos alimenticios y tenían acceso a una mayor variedad de hábitats que los adultos, independientemente del sexo. A través de los modelos de mezcla determinamos que la planta acuática *Pistia stratiotes* era la principal fuente dietética para las hembras adultas, mientras que las plantas ribereñas eran más importantes para los juveniles y machos adultos, sugiriendo una partición de nicho intraespecífica. También identificamos rutas energéticas distintas para *D. mawii* y la comunidad de peces, con las tortugas dependiendo de plantas vasculares (tanto ribereñas como acuáticas) mientras que los peces dependen principalmente del seston. Nuestros hallazgos sugieren que *D. mawii* puede desempeñar un papel crucial en el ciclo de nutrientes y potencialmente regular la presencia de la macrófita flotante *P. stratiotes* en el sitio de estudio.

Session: Ecology and Conservation of the Central American River Turtle (*Dermatemys mawii*)

Boas of the West Indies

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Abstract: In this presentation, I will discuss the current state of our knowledge regarding the boas of the West Indies. I will offer a tour of the diversity of boas on the islands of the Greater Antilles and the Lucayan Archipelago, pausing at each to describe what we know, and what we do not yet know, about the biology of the species that are found there. I will then summarize the origins of this boa fauna, and what major outstanding questions remain. I hope to encourage others to join in the study of this fascinating group of underappreciated snakes.

Session: Reptiles and Snakes of the Caribbean

Post Hurricane-Dorian Landscape and Ecosystem Monitoring Project in the Abaco Islands (The Bahamas)

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Abstract: Low-lying island nations like The Bahamas are particularly vulnerable to the impacts of climate change. This is especially true of the Bahamian pine islands, where the pineyards (*Pinus caribaea var. bahamensis*; rich fire-adapted reservoirs of biological diversity), are regulated by a complex interaction between elevation, groundwater salinity, fire, and increasingly frequent wind disturbances. Since The Bahamas is at risk of major wind damage from hurricanes, management efforts that mitigate both ecosystem resistance and resilience must be prioritized. As a key example, Hurricane Dorian, a Category 5 storm, caused extraordinary devastation to the region in 2019. The goal of our US Forest Service-funded project was to develop forest structure and fuel estimates from field data collection of surface fuels, as well as aerial and ground LiDAR data taken post-Dorian. Accordingly, we aimed to (1) quantify Dorian's immediate effects on fuel loads, forest structure, and biological diversity, and to (2) work closely with our Bahamian partners to recommend potential means of mitigating the damage through management intervention. The presentation will provide an overview of the project, including the research team and respective areas of expertise, data collection methods, a summary of preliminary results, and a plan for future research efforts.

Session: Plant/Animal/Bird Interactions

Population Dynamics and Reproductive Biology of the Melodious Coquí, *Eleutherodactylus wightmanae*, in an Assemblage Context

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Abstract: Long-term monitoring of herpetofaunal populations in tropical mountain forests provides critical insights into species' responses to climatic variability. From March 2014 to February 2020 and again from March to August 2025, a study of amphibian assemblages in Puerto Rico revealed differential changes in abundance among six species across contrasting topographic contexts. While most species showed marked fluctuations presumably linked to microclimatic conditions, the Melodious Coqui (*Eleutherodactylus wightmanae*) exhibited relatively stable abundance across space and time. This stability highlighted the need for closer examination of its population biology and reproductive ecology. Population surveys were conducted to assess fluctuations in adult and juvenile abundance and their use of

microhabitats. Reproductive traits were documented, including clutch size distribution, developmental time, frequency of parental care, fertility, and hatching success. Seasonal patterns and temporal changes in egg clutch production were also evaluated within the broader assemblage context. The Melodious Coqui maintained consistent population levels relative to other coqui species that exhibited site- and climate-dependent variability. Adults and juveniles showed distinct patterns of microhabitat use. Clutch sizes followed a characteristic frequency distribution, with variable developmental times and measurable rates of parental care. Fertility and hatching success were quantified, and egg clutch production showed seasonal peaks with shifts across years. This study provides the first comprehensive account of the population dynamics and reproductive ecology of the Melodious Coqui since its description in 1920. By integrating long-term assemblage monitoring with detailed species-level data, the results enhance understanding of this little-known endemic frog and contribute to broader knowledge of amphibian resilience and natural history in tropical mountain forests.

Session: Frogs of the Caribbean

Fine-Scale Bioregionalization in a Complex Island System: A Freshwater Perspective from the Greater Antilles

Biorregionalización A Escala Fina En Un Sistema Insular Complejo: Una Perspectiva De Agua Dulce Desde Las Antillas Mayores

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Abstract: The isolated nature of islands makes them particularly vulnerable to climate change. The freshwater fishes of the Greater Antilles remain understudied and are further threatened by habitat fragmentation and the introduction of exotic invasive species. A practical solution to protect this diversity is to develop a spatially explicit framework to inform conservation actions. We test whether biogeographically significant subregions can be identified within the Greater Antilles. We compiled a dataset of 1,704 occurrence records based on museum vouchers and the authors’ fieldwork, and genetic data. Ninety-two percent of the freshwater fish fauna of the Greater Antilles is endemic. Although diversity is unevenly distributed among and within islands, patterns of species richness and weighted endemism partially align across islands. The Greater Antilles are a mosaic of biogeographically meaningful subregions, each harboring unique, highly vulnerable, and sometimes range-restricted, species

assemblages. The patterns recovered reflect a complex interplay among the region's geological history, and colonization and speciation events. Our proposed areas of endemism provide a testable hypothesis to investigate the evolutionary history of freshwater taxa in the region; additionally, these areas provide natural management units that can serve as geographic targets for conservation prioritization and policymaking of freshwater ecosystems in the Greater Antilles.

Resumen: Las islas, por su aislamiento, son especialmente vulnerables al cambio climático. Los peces de agua dulce de las Antillas Mayores siguen poco estudiados y enfrentan amenazas crecientes por la fragmentación del hábitat y la introducción de especies invasoras. Para proteger esta diversidad, se propone un marco espacialmente explícito que guíe las acciones de conservación. Se recopilaron datos de 1704 registros de ocurrencia basados en especímenes de museos y el trabajo de campo de los autores, y datos genéticos —, se evaluó la posibilidad de identificar subregiones biogeográficas significativas. El 92 % de la ictiofauna de agua dulce de las Antillas Mayores es endémica. La riqueza y el endemismo se distribuyen de manera desigual entre y dentro de las islas, pero sus patrones se alinean parcialmente. La región conforma un mosaico de subregiones biogeográficas, cada una con especies únicas y vulnerables, muchas con rangos restringidos. Estos patrones reflejan la interacción entre la historia geológica de la región, y eventos de colonización y especiación. Las áreas de endemismo identificadas representan hipótesis sobre la evolución de los peces de agua dulce y constituyen unidades naturales de manejo que pueden servir como base para priorizar la conservación y orientar políticas en los ecosistemas dulceacuícolas de las Antillas Mayores.

Session: Freshwater Biodiversity in the Caribbean

Organic Contaminants in The Common Clubhook Squid in the Northern Gulf of Mexico

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Abstract: Cephalopods play a crucial role in pelagic food webs as both predators and prey, and their role in transferring contaminants to top predators isn't fully understood. In February 2020, stomach samples were collected from tunas caught near offshore platforms aboard the F/V Gulf Eagle. Tuna gut analysis revealed that most of the cephalopods were Common Clubhook squid (*Onychoteuthis banksii*). This study examined 159 organic contaminants in the mantle tissue of 20 cephalopods using accelerated solvent extraction and GC/MS/MS/MRM. Contaminants studied include polycyclic aromatic hydrocarbons (PAHs), oxidized PAHs (OPAHs), polychlorinated biphenyls (PCBs), organochlorinated pesticides (OCPs), and emerging contaminants of concern (ECCs) such as phthalates and UV filters. Results showed mean total contaminant concentrations were ∑ECCs > ∑PAHs > ∑OCPs > ∑PCBs. Our findings also showed that ∑PAHs and ∑OCPs were negatively correlated with mantle length, suggesting a growth dilution effect in the squid.

Session: Invertebrates in the Gulf of Mexico: Responses to Anthropogenic Influences

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Investigating Habitat Preferences and Diversity of Lichens in Montserrat, West Indies

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Abstract: Across the Caribbean, lichens are notoriously understudied, with an estimate of 50% of tropical lichens remaining unidentified. This project aims to further understand lichens on a mechanistic basis by assessing whether the three main morphological types of lichens – crustose, foliose, and fruticose – have a preference for habitat type in Montserrat, WI. Montserrat is a relatively small (102 km²), mountainous, and biodiverse island in the Lesser Antilles. To date, relatively little botanical research and no published studies on lichen have been conducted in Montserrat. This is due to the islands' small size and relative inaccessibility, strongly influenced by volcanic activity spanning 1995-2012. We found a significant relationship between corticolous crustose lichens and the dry scrub habitat, suggesting a relation between their morphology and life history, and the environmental conditions. This research contributes to understanding how microclimatic factors shape lichen communities in the Neotropics. In addition, lichen collections were identified using microscopic and chemical methods. This works towards the first preliminary checklist of lichens in Montserrat. This project provides information that can be useful for future researchers, including potential conservation efforts, and adds to the growing understanding of the biodiversity in Montserrat.

Session: Botany of Montserrat

Vulnerable fishes of the Greater Antilles: the genus Limia and behavior, speciation, radiation and biogeography

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Abstract: The genus Limia contains about 20 species and is endemic to the Greater Antilles. We have formed an international team focused on fair science and combining local scientists from several countries to study this unique group of fishes. Almost all of the Limia species occur on Hispaniola with about half of the species living in a lake, Étang de Miragoâne in Haiti. The radiation in the Étang de Miragoâne is likely the only one in the family Poeciliidae and is very poorly understood. The existing molecular data point to a monophyletic origin of the fishes in the lake, but what selection pressure may have led to a radiation is unclear. Our group is engaged in studying Limia broadly, including molecular genetics, behavior, morphology, coloration, and field ecology. Several of the Limia species have small distribution ranges and need protection, especially the fishes in Étang de Miragoâne. The International Stock Center

for Livebearing Fishes at the University of Oklahoma currently keeps 10 species of Limia and can provide them for research.

Session: Freshwater Biodiversity in the Caribbean

Invasive rodent responses to hurricanes in Caribbean islands

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Abstract: Invasive rodents, particularly Black Rat (*Rattus rattus*) and House Mouse (*Mus musculus*) are established on most islands and threaten many natural resources. How invasive rodents respond to hurricanes is not well understood, but shifts in rodent abundance and foraging may result from scarce fruit and seed resources that follow hurricanes. We conducted rodent population studies on three islands in St. Croix before and after Hurricane Irma/Maria. Additionally, in a Puerto Rico forest, we assessed how experimental (Canopy Trimming Experiment) and natural (Hurricane Maria) hurricane effects alter populations of invasive rodents and their foraging behaviors. We found that: 1) Black Rats established on Green Cay following the hurricanes, 2) House Mouse populations doubled on two St. Croix islands, 3) rat populations were not significantly affected by experimental or natural hurricanes, 4) seed removal was rat dominated (75%–100% rat-removed) and declined after Hurricane Maria, yet rats removed more seeds from patches of forest cover, and 5) the House Mouse invaded the forest from nearby roads post-hurricane and remained for 4+ years. Predictions of increased hurricane frequency should result in: resistant and resilient rodent populations, new rat establishments on islands, and forest with more frequent periods of grassy understories and mouse presence.

Session: Climate Response Research in the Caribbean

Reproductive Cycles and Investment Patterns of the Northern Giant Musk Turtle (*Staurotypus triporcatus*) in Belize

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Abstract: The Northern Giant Musk Turtle (*Staurotypus triporcatus*) is a freshwater species native to eastern drainages in Mesoamerica. We initiated a study of reproductive patterns of *S. triporcatus* in central Belize in 2023. Our study site is a small lagoon with limited seasonal connectivity with the Belize River. In May–June, we captured 10 reproductively mature females. We affixed radio and acoustic transmitters to the carapace of each turtle to allow tracking and recovery in both water and on land. Turtles were

recaptured monthly to assess reproductive condition using an ultrasound and, when eggs were present, we obtained radiographs to document clutch size and the number of clutches. Shelled eggs were first observed on 13 September. The proportion of gravid females peaked in October, when 100% of females in the study contained eggs. Egg follicle growth began with the onset of the rainy season. Radiograph data indicates that most females produced multiple clutches between November and February. We found no relationship between female size and egg or clutch size, nor did we find a relationship between clutch size and eggs size. There was a positive relationship between clutch order and egg width.

Session: Freshwater Turtles of the Caribbean

Challenges and Opportunities for the Study of Evolution and Conservation of Freshwater Fishes in Hispaniola

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Abstract: The island of Hispaniola is one of the main centers of diversity and endemism in the Caribbean. Even though Hispaniola has more than 60 native species of fish, 31 of which are endemic, this fish diversity has been overlooked. Adaptation has been invoked as a main driver of diversification of fishes in Hispaniola and the Caribbean, but research focused on mechanisms and hypothesis testing beyond patterns has been historically limited. My research combines phylogenomics, functional morphometrics, and trophic ecology data to understand evolutionary mechanisms of diversification of freshwater fishes in Hispaniola, with a focus on members of the family Poeciliidae, the largest clade of inland water fishes in the Caribbean. In this presentation, I will share preliminary results on phylogenetic relationships in Poeciliidae and its implications for our understanding of evolutionary history and biogeography of fishes in the Caribbean, as well as inter- and intraspecific genetic diversity among contemporary populations that could inform conservation management efforts.

Session: Fishes of the Wider Caribbean

Habitat Preferences and Population Trends of Eight Landbird Species in Guánica State Forest, Puerto Rico

Preferencias de hábitat y tendencias poblacionales de ocho especies de aves terrestres en el Bosque Estatal de Guánica, Puerto Rico

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Abstract: This work evaluated the status and distribution of eight native and endemic landbird species in Guánica State Forest, a subtropical dry forest in southwestern Puerto Rico (PR). We used open-access point count data collected by the National Ecological Observatory Network to determine if the mean number of individuals remained stable or changed through a 10-year period, from 2015–2025. Species were identified by visual or aural cues, and recorded during six minutes counts. The PR Vireo (*Vireo latimeri*), Adelaide's Warbler (*Setophaga adelaidae*), Black-whiskered Vireo (*Vireo altiloquus*), and PR Bullfinch (*Melopyrrha portoricensis*) did not show significant changes throughout the nine study years. However, the Bananaquit (*Coereba flaveola*), exhibited significant fluctuations, and the Puerto Rican Lizard-Cuckoo (*Coccyzus vieilloti*) and PR Tody (*Todus mexicanus*), showed small declines over the years. Higher canopy cover was associated with increased abundance for most species. In contrast, the Bananaquit, the most flexible species according to habitat preferences, was abundant in all grids throughout the forest. Long-term monitoring is crucial to address the impacts of climate change and natural disasters on bird populations. Future work will assess the effects of climate variability to relate to population trends and inform biodiversity management strategies for Puerto Rico's dry forest ecosystem.

Resumen: Este estudio evaluó el estado y la distribución de ocho especies de aves terrestres nativas y endémicas en el Bosque Estatal de Guánica, un bosque seco subtropical ubicado en el suroeste de Puerto Rico (PR). Se utilizaron datos de conteos de puntos de acceso abierto recopilados por la Red Nacional de Observatorios Ecológicos (NEON, por sus siglas en inglés) para determinar si el número promedio de individuos se mantuvo estable o cambió a lo largo de un periodo de diez años, entre 2015 y 2025. Las especies fueron identificadas mediante observación visual o auditiva, y registradas durante conteos de seis minutos. El Bienteveo (*Vireo latimeri*), Reinita Mariposera (*Setophaga adelaidae*), el Julián Chiví (*Vireo altiloquus*) y el Comeñame (*Melopyrrha portoricensis*) no mostraron cambios significativos a lo largo de los nueve años del estudio. Sin embargo, la Reinita Común (*Coereba flaveola*) presentó fluctuaciones significativas, mientras que el Pájaro Bobo (*Coccyzus vieilloti*) y el San Pedrito (*Todus mexicanus*) mostraron leves disminuciones con el tiempo. Una mayor cobertura de dosel se asoció con una mayor abundancia en la mayoría de las especies. En contraste, la Reinita Común, considerada la especie más flexible según sus preferencias de hábitat, fue abundante en todas las cuadrículas del bosque. El monitoreo a largo plazo es esencial para abordar los impactos del cambio climático y los desastres naturales sobre las poblaciones de aves. Futuros trabajos evaluarán los efectos de la variabilidad climática en las tendencias poblacionales y aportarán información para estrategias de manejo de la biodiversidad en el ecosistema de bosque seco de Puerto Rico.

Session: Caribbean Ornithology I

Mercury Contamination and Wildlife Monitoring in the Ayapel Swamp, Colombia: A Bi-National Approach to Assessing Threats in a Ramsar Wetland

Contaminación por Mercurio y Monitoreo de Vida Silvestre en la Ciénaga de Ayapel, Colombia: Un Enfoque Binacional en un Humedal Ramsar

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Abstract: The Ayapel Swamp, a Ramsar-designated wetland in Colombia's Mojana region, plays a vital role in regulating water flows from the San Jorge and Cauca rivers and sustains rich biodiversity, including fish, migratory birds, and bats. Despite its recognized ecological importance, the area faces escalating environmental degradation driven by deforestation, illegal mining, and contaminated sediment inflows. These pressures have resulted in heightened mercury levels in water, sediments, and wildlife, posing significant risks to both ecosystem health and local communities. In response, a collaborative effort between the Biodiversity Research Institute (BRI) and Colombia's Humboldt Institute has launched a comprehensive wildlife mercury monitoring program in the Ayapel Swamp. Sampling efforts included fish, birds, bats, soils, and sediments across aquatic, terrestrial, and wetland habitats. The study not only assesses spatial variations in mercury bioaccumulation but also supports capacity building, training Colombian scientists in tissue sampling techniques for contaminant biomonitoring. Analyses are being conducted in BRI's specialized laboratory in the United States. By integrating ecological research with local expertise, this project offers critical insights into mercury dynamics in a vulnerable wetland ecosystem and underscores the urgency of science-based strategies for biodiversity conservation and public health protection.

Resumen: La Ciénaga de Ayapel, ubicada en la región de La Mojana, en el caribe Colombiano, es un humedal Ramsar clave para la regulación hídrica de los ríos San Jorge y Cauca y alberga una biodiversidad relevante, incluyendo peces, aves migratorias y murciélagos. Sin embargo, en los últimos años ha sufrido una creciente degradación ambiental debido a la deforestación, la minería ilegal y los sedimentos contaminados, lo que ha elevado los niveles de mercurio en el agua, sedimentos y fauna. Esta contaminación amenaza los ecosistemas locales y la salud de las comunidades que dependen de ellos. Para abordar esta situación, el Biodiversity Research Institute (BRI) y el Instituto Humboldt implementaron un programa binacional de monitoreo de mercurio en vida silvestre. Se recolectaron muestras de peces, aves, murciélagos, suelos y sedimentos en diferentes hábitats. Además de evaluar la bioacumulación de mercurio, el proyecto fortaleció capacidades técnicas mediante la capacitación de investigadores colombianos en técnicas de muestreo de tejidos. Los análisis se realizan en el laboratorio especializado del BRI en Estados Unidos. Este trabajo provee información clave sobre la dinámica del mercurio en un humedal vulnerable y resalta la necesidad de estrategias científicas para proteger la biodiversidad y la salud pública.

Session: Soil and Freshwater research in the Caribbean

Iguanas of the Caribbean and Bahamas, Including Invasive Green Iguanas

Iguanas del Caribe y las Bahamas, Incluyendo la Iguana Verde Invasora

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Abstract: There are eleven species of Cyclura native to the Caribbean and Bahamas. Many islands and species have a research biologist or zoo personnel working with the respective species. As in all insular populations, each species has their share of problems, many of which are the same but there are some islands with separate issues. There have been several management plans organized through the IUCN Iguana Specialist Group for the critically endangered species. Overall conservation efforts have increased several populations, yet some remain critically endangered. One of the many issues faced with several of the islands is the introduction of green iguanas, which as an extremely successful invader. Since this is such a new problem, there are many projects designed to stem the introductions. Removal efforts are also in the early stages of development

Resumen: Existen once especies de Cyclura nativas del Caribe y las Bahamas. Muchas islas cuentan con biólogos investigadores o personal de zoológico que trabajan con las respectivas especies. Como en todas las poblaciones insulares, cada especie enfrenta sus propios problemas, muchos de los cuales son comunes, aunque algunas islas tienen problemáticas específicas. Se han elaborado varios planes de manejo a través del Grupo de Especialistas en Iguanas de la UICN para las especies en peligro crítico de extinción. Los esfuerzos de conservación han logrado incrementar varias poblaciones, pero algunas aún se encuentran en peligro crítico. Uno de los principales problemas que enfrentan varias islas es la introducción de la iguana verde, una especie invasora sumamente exitosa. Dado que se trata de un problema relativamente reciente, existen numerosos proyectos diseñados para contener su introducción. Los esfuerzos de erradicación también se encuentran en sus primeras etapas de desarrollo.

Session: Reptiles and Snakes of the Caribbean