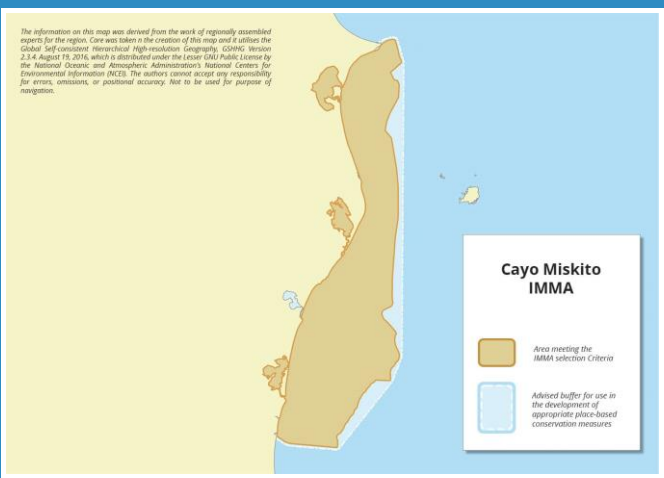

Area Size

5,198 km²

Qualifying Species and Criteria

Guiana Dolphin – *Sotalia guianensis*

Criterion B (1)

Greater Caribbean Manatee – *Trichechus manatus manatus*

Criterion A; C (2)

Other Marine Mammal Species Documented

Tursiops truncatus

Summary

The Cayos Miskito IMMA is located along the northeastern Caribbean coast of Nicaragua. The area extends from Cabo Gracias a Dios on the northern boundary to the mouth of the Wauhta Lagoon on the southern boundary. It includes the coastal lagoons of Bismuna, Pahara and Wauhta and the adjacent marine waters up to 20 m isobath. The area is influenced by rivers, estuarine and marine waters. Seagrass and seaweed beds, as well as coral reefs, create the conditions for the development of numerous species of fish and invertebrates. The area is inhabited by a small population of Guiana dolphins (*Sotalia guianensis*) and the Greater Caribbean/Antillean manatee (*Trichechus manatus manatus*), with populations estimated to be 50 and 350 individuals, respectively. The Guiana dolphins in this IMMA represent one of only the two populations found in Central America (600 km south in Costa Rica and Panama). The area is inside the Cayos Miskitos EBSA, IBA and RAMSAR wetland status.

Cayo Miskito IMMA

Summary, continued.

Description:

The Cayo Miskitos IMMA is located in the northern Caribbean of Nicaragua. From north to south, it extends from Cabo Gracias a Dios to the mouth of Wauhta Lagoon. This area is characterized by the influence of slow-moving rivers and creeks, coastal large brackish lagoons and bays near the coast and the open sea (Jimenez, 2001). The annual rainfall is around 2500-3500 mm (Edwards & Schnell, 2001; Jimenez, 2001). The borders of lagoons are covered mainly by mangroves (*Rhizophora mangle* and *Avicennia germinans*) and freshwater grasses (Edwards & Schnell, 2001; Jimenez, 2001). In the marine waters (from coast to 20 m deep), Cayos Miskito has seagrass meadows (*Thalassia testudinum*), algae and sandy beds and rocky areas, of stony coral reefs and octocorals gardens (Secretariat of the Convention on Biological Diversity, 2014; Jimenez, 2001). This area is part of a rich marine ecosystem that have high concentrations of nutrients and zooplankton and provide food, shelter and breeding areas for numerous species of fish and invertebrates (Edwards & Schnell, 2001). The water temperature had an average of 29.4 °C, ranging from 25 to 32°C in dry months (March to April) and the salinity ranges from 0 to 33 °/₀₀ (Edwards & Schnell, 2001).

Figure 1: A group of Guiana dolphin (*Sotalia guianensis*) observed in Costa Rica. Photo credit: J. Kiszka (Florida International University).

Figure 2: Guiana dolphin (*Sotalia guianensis*) surfacing in Costa Rica. Photo credit: J. Kiszka (Florida International University).

The Cayos Miskitos IMMA is inside the Cayos Miskitos EBSA designed by Convention of Biological Diversity. Also, this area is recognized as an Important Bird Area by Bird Life International. At national level, the IMMA area is part of Cayos Miskitos Marine and Franja Costera Adyacente Reserve. Finally, this area has a RAMSAR wetland status.

Criterion A: Species or Population Vulnerability

The IMMA provides important habitat for Greater Caribbean manatee (*Trichechus manatus manatus*) is listed Endangered on the IUCN Red List with a decreasing trend (Morales-Vela et al., 2024). The estimated population in Nicaragua is around 350 individuals (Jimenez, 2001; Morales-Vela et al., 2024). The main threat in the area is illegal poaching by direct hunt by harpoon and gill or circle nets (Jimenez, 2002). A decrease in sightings or absence based on interviews and direct observations had been reported in areas suitable for your presence (Jimenez, 2002).

Criterion B: Distribution and Abundance Sub-criterion B1: Small and Resident Populations

The Guiana dolphin (*Sotalia guianensis*) is a coastal species found in discrete and discontinuous populations from southern Brazil to Honduras (da Silva & Best, 1996; Secchi et al., 2018). This species is categorized as Near Threatened based on the IUCN Red List (Secchi et al., 2018). Although incomplete, assessments of its distribution, abundance, and threats are increasingly well-documented along the Atlantic coast of South America (Secchi et al., 2018). The northernmost populations are found in "Cayos Miskito y Franja Costera Inmediata Biological Reserve", Nicaragua, and in "Gandoca-Manzanillo Wildlife Refuge", Costa Rica, and Changuinola, Panama (Carr & Bonde, 2000; Edwards & Schnell, 2001; Acevedo et al., 2005; Gamboa & May-Collado, 2006; May-Collado et al., 2017).

This IMMA hosts one of the only two known small populations of Guiana dolphins in Central America. The other is on the border of Costa Rica and Panama, around 600 km to the south. Given the relatively small home ranges displayed by other populations of Guiana dolphins (e.g Oshima & de Oliveira, 2016, who describe small home ranges in Brazil), it can be expected that this population is resident in the IMMA with little or no exchange with other populations. Caballero et al. (2018) found one low- quality DNA sample from Cayos Miskito that shared one haplotype with samples from the Maracaibo Lake in Venezuela and the Colombian Caribbean. However, due to the geographic isolation of Cayos Miskito and the discontinuous distribution of Guiana dolphins along the coast of Central America, it is likely that this population is geographically isolated, including from populations in Costa Rica/Panama.

Edwards and Schnell (2001) conducted surveys from March through May of 1996-1998 in Cayos Miskito and reported that Guiana dolphins occur in shallow waters and within 300 m from shore. Depths of sightings ranged from 1 to 5 m. During boat surveys 183 groups (536 individuals) were sighted (for areas with *Sotalia*, mean overall density = 0.604 individuals/km^2, coastal areas = 0.647/km^2, inlets = 0.578/km^2, and lagoons = 0.486/km^2). Overall, based on all sightings, mean group size was 3.01 (SD = 1.79, range 1–15) and varied among years ($\bar{x}$= 4.20 in 1996, 2.58 in 1997, and 3.39 in 1998), but not for different months. Abundance was estimated to be 49 individuals based on the portions of the Reserve investigated (Edwards & Schnell, 2001).

Criterion C: Key Life Cycle Activities Sub-criterion C2: Feeding Areas

Through a series of extensive small boat and interview surveys Jimenez (2002) identified the coastal lagoons of Bismuna, Pahara and Wauhta, which are encompassed in this IMMA, as hosting some of the highest densities of Greater Caribbean manatees in Nicaragua. He reported that manatees living in these brackish lagoons feed on submerged grasses (*Sirigodium filiforme* and *Thalassia testudinum*) and mangrove (*Rhizophora mangle*) leaves.

Supporting Information

Acevedo-Gutiérrez, A., DiBerardinis, A., Larkin, S., Larkin, K., and Forestell, P. 2005. 'Social interactions between tucuxis and bottlenose dolphins in Gandoca-Manzanillo, Costa Rica'. LAJAM 4, 49–54. Available at: https://doi.org/10.5597/lajam00069.

Caballero, S., Hollatz, C., Rodríguez, S., Trujillo, F., and Baker, C.S. 2018. 'Population structure of riverine and coastal dolphins *Sotalia fluviatilis* and *Sotalia guianensis*: patterns of nuclear and mitochondrial diversity and implications for conservation'. Journal of Heredity, 757-770.

Carr, T. and Bonde, R.K. 2000. 'Tucuxi (*Sotalia fluviatilis*) occurs in Nicaragua, 800 Km North of its previously known range'. Marine Mammal Science, 16(2), 447–452. Available at: doi:10.1111/j.1748-7692.2000.tb00936.x.

Da Silva, V.M.F. and Best. R.C. 1996. '*Sotalia fluviatilis*'. Mammalian Species, 527: 1-7.

Edwards, H.H. and Schnell, G.D. 2001. 'Status and ecology of *Sotalia fluviatilis* in the Cayos Miskito Reservce, Nicaragua'. Marine Mammal Science, 17(3): 445-472.

Gamboa-Poveda, M. 2009. Tamaño poblacional, distribución y uso de hábitat de dos especies simpátricas de delfines en el Refugio Nacional de Vida Silvestre Gandoca-Manzanillo, Costa Rica. Trabajo de graduación para optar por el grado de Maestría. Universidad Nacional, Costa Rica. 90p.

Gamboa-Poveda, M. and May–Collado, L. 2006. Insights on the occurrence, residency, and behavior of two coastal dolphins from Gandoca-Manzanillo, Costa Rica: *Sotalia guianensis* and *Tursiops truncatus* (Family Delphinidae). Paper SC/58/SM4 presented to the IWC Scientific Committee, June 2006.

Guzman, H.M. and Condit, R. 2017. 'Abundance of manatees (*Trichechus manatus*) in a Panama wetland estimated from side-scan sonar'. Wildlife Society Bulletin, 41(3), 556-565. Available at: https://doi.org/10.1002/wsb.793.

Jiménez, I. 2002. 'Heavy poaching in prime habitat: the conservation status of the West Indian manatee in Nicaragua'. Oryx, 36(3):272-278. Available online: doi:10.1017/S0030605302000492.

May-Collado, L.J. 2010. 'Changes in whistle structure of two dolphin species during interspecific associations'. Ethology, 116:1065-1074.

May-Collado, L.J. and Wartzok, D. 2009. 'A characterization of Guyana dolphin (*Sotalia guianensis*) whistles from Costa Rica: The importance of broadband recording systems'. Journal of the Acoustical Society of America, 125 (2): 1202-1213.

May-Collado, L.J., Amador-Caballero, M., Casas, J.J., Gamboa-Poveda, M.P., Garita-Alpízar, F., Gerrodette, T., González-Barrientos, R., Hernández-Mora, G., Palacios, D.M., Palacios-Alfaro, J.D., Pérez, B.,

Rasmussen, K., Trejos-Lasso, L., and Rodríguez-Fonseca, J. 2017. Chapter 12. Ecology and Conservation of Cetaceans of Costa Rica and Panama. In Advances in Marine Vertebrate Research in Latin America (M. Rossi-Santos and C. Finkl eds). Springer Press. Print ISBN: 978-3-319-56984-0; Electronic ISBN: 978-3-319-56985-7.

Mignucci-Giannoni, A.A., González-Socoloske, D., Aquarium, C., Aquino, J., Caicedo-Herrera, D., Castelblanco-Martínez, D.N., Claridge, D., Corona-Figueroa, F., Debrot, A.O., de Thoisy, B., Espinoza-Marín, C., Galves, J.A., García-Alfonso, E., Guzmán, H. M., Khan, J.A., Kiszka, J.J., de Oliveira Luna, F., Marmontel, M., Olivera-Gómez, L. D., ... Silva, C.J. 2024. 'What's in a Name? Standardization of Vernacular Names for *Trichechus manatus*'. Caribbean Naturalist, 98:1-17. Available at: https://www.eaglehill.us/CANAonline/CANA-access-pages/CANA-regular/CANA-098-Mignucci.shtml.

Morales-Vela, B., Quintana-Rizzo, E. and Mignucci-Giannoni, A. 2024. '*Trichechus manatus* ssp. *manatus*'. The IUCN Red List of Threatened Species 2024: e.T22105A43793924. (Accessed: 15 November 2024).

Oshima, J.M. and Oliveira-Santos, M.C. 2016. 'Guiana dolphin home range analysis based on 11 years of photo-identification research in a tropical estuary'. Journal of Mammalogy, 2(97):599–610. Available at: https://doi.org/10.1093/jmammal/gyv207.

Secchi, E., Santos, M.C., de, O., and Reeves, R. 2018. '*Sotalia guianensis* (errata version published in 2019)'. The IUCN Red List of Threatened Species 2018: e.T181359A144232542. Available at: https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T181359A144232542.en. (Accessed: 19 April 2024).

Secretariat of the Convention on Biological Diversity. 2014. Ecologically or Biologically Significant Marine Areas (EBSAs): Special places in the world's oceans. Volume 2: Wider Caribbean and Western Mid-Atlantic Region. 86 pages.

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