

# Cuba

CARIBBEAN DIVISION | THE WORLD WE DEPEND ON DEPENDS ON US

## From precious reefs to lush mangroves this Caribbean jewel needs protecting

***Boasting extraordinary biodiversity throughout its waters, forests and wetlands, Cuba is home to over 6,000 plant species, half of which are found nowhere else in the world, and countless wildlife species, from endangered manatees to the world's smallest bird.***

This vibrant archipelago—a main island over 700 miles long and nearly 1,600 smaller islands and cays—contains the Caribbean's largest mangrove forest and 36 percent of all coral reefs in the region. Found where the Atlantic Ocean, Caribbean Sea and Gulf of Mexico meet, ocean connectivity studies conducted by The Nature Conservancy (TNC) and partners have shown that Cuba's waters are critical for sustaining thriving fisheries not only within the country but also in other parts of the Caribbean and the United States.

Throughout its history, Cuba has shown a strong commitment to conservation, and currently 25 percent of its marine and coastal environments are under protection. Its ecosystems have therefore remained healthier over the past several decades than those in many other Caribbean countries. However, while Cuba is a regional leader in conservation, it still faces grave challenges as the impacts of climate change and other threats escalate.

TNC has been working in Cuba for over 20 years to proactively address these threats and help preserve the country's vital biodiversity. Today, TNC works closely with Cuban partners to implement ecosystem-based solutions, including the protection and restoration of the country's iconic coral reefs and mangroves. Through these efforts, TNC aims to support Cuban communities in building climate resilience and help ensure a more sustainable future for nature and people in this beautiful country.



## Protecting a Critical Source of Biodiversity

Because it is located at the meeting point of three major bodies of water, Cuba serves as a hub of essential biodiversity that surrounding marine ecosystems and migratory species rely on to survive. **In fact, studies led by TNC have shown that Cuba's waters provide the larvae of key coral species that help sustain reefs throughout the entire Caribbean region.**

To build on the country's healthy biodiversity and unique location, TNC is pursuing conservation opportunities in Cuba that integrate ecological connectivity into the development of management plans for marine protected areas and fisheries. For example, TNC scientists have been working with experts from several countries on a collaborative, connectivity-based framework to better protect the marine environment shared by Cuba, other Caribbean islands and the United States. TNC has also organized and funded a series of learning exchange visits between Cuban marine protected area managers and the U.S. National Park Service to promote knowledge sharing and build capacity for effective marine management in both countries.



**Cuba's strong biodiversity serves as proof that effective protection of marine environments leads to flourishing ecosystems.** For example, the country's Jardines de la Reina National Park was established in 2002 and today exhibits extraordinarily robust coral reefs and other habitats. A decade after the park was established, TNC and partners completed the first comprehensive reef assessments in the park and reported that the park's biodiversity essentially served as a window into the past. They found healthy reefs, mangroves and seagrass beds teeming with fish and other marine life—an underwater world similar to what existed throughout the Caribbean decades earlier before the impacts of climate change, overfishing and unsustainable development began to seriously threaten the ocean.

## Applying Advanced Techniques for Stronger Ecosystems and Greater Resilience

There are more than 1,000 square miles of coral reefs in Cuba. These and other marine and coastal ecosystems, like mangroves, provide natural protection for coastlines against erosion, flooding and other impacts of climate change. TNC is implementing cutting-edge science and technologies to advance an ecosystem-based approach that will help Cuban communities build resilience against climate-related threats. This approach includes identifying particularly vulnerable coastal areas, quantifying the economic and natural protection benefits of ecosystems, and using advanced techniques to protect and restore ecosystems.

As part of this work, TNC provided the Cuban government with a suite of computers equipped with InVEST, a software that facilitates ecosystem valuation and vulnerability modeling. It is rare that a U.S.-based organization can donate this type of technology to Cuba, and this endeavor was made possible only through TNC's longstanding history of collaboration with the Cuban government. TNC scientists provided comprehensive training on how to use InVEST, along with advanced geographic information systems and other spatial visualization tools, to create habitat maps, run complex coastal vulnerability models and quantify the coastal protection benefits of ecosystems.

The vulnerability models calculate the relative exposure of the shoreline to climate-related hazards based on the presence of coral reefs and mangroves. Layering these calculations with socio-economic data helps identify high-risk communities and allows the Cuban government to better manage its valuable ecosystems to enhance climate resilience.

For example, while Cuba currently has over 200 marine areas under protection, there are significant challenges securing resources to effectively manage them. **The modeling technology and training allow management plans to be developed that prioritize conservation areas and actions and help ensure the long-term health of ecosystems while using them sustainably.** This initiative also identifies gaps in Cuba's National Protected Areas System that need to be addressed, like coral reefs near vulnerable communities that are not currently protected.



## Accelerating Reef Restoration Through Science and Collaboration

In addition to identifying coral reefs that need protection, underwater habitat maps created by TNC and partners are pinpointing areas that urgently need restoration. TNC has been supporting coral restoration in Cuba for several years and is now accelerating efforts using innovative science and technology. After helping to establish Cuba's first coral nurseries in 2015, TNC is supporting Cuban partners as they work to scale up restoration efforts using microfragmentation and facilitated sexual reproduction techniques.

TNC scientists created a workshop for Cuban coral experts that introduced them to facilitated sexual coral reproduction—a process in which coral gametes, or eggs and sperm, are collected during rare natural spawning events and used to create and raise embryos in a lab until they are strong enough to settle onto reefs. TNC then helped Cuban partners plan a spawning mission by sharing data to predict the timing of a natural spawning event and providing training on gamete collection and fertilization methods. **This collaboration marked the country's first successful spawning mission, with gametes collected from multiple colonies of endangered staghorn corals in Guanahacabibes National Park.**

CLOCKWISE Protected coastal wetlands in Cuba, including mangrove forests, provide essential habitat for threatened Cuban and American crocodiles. © Lorenzo Ragazzi/TNC Photo Contest 2018; Robust mangroves help protect coastlines along Cuba's Zapata Peninsula. © Marci Eggers/TNC; Cuba's healthy waters and coral reefs sustain vulnerable species of sharks and other marine animals. © Ian Shive; A diver swims among thriving corals in Cuba's Punta Frances Marine National Park. © David E. Guggenheim



TNC is continuing to move novel techniques and technologies forward that will help build Cuba's capacity to preserve its precious coral reefs. By gathering highly detailed satellite data, TNC and partners are continually improving underwater habitat maps and identifying coral reefs most in need of restoration. In addition, TNC is helping to develop the country's first coral restoration laboratory, which will allow local and international organizations to work together to advance coral science and restoration for meaningful outcomes in Cuba and beyond.

## Raising Awareness About the Crucial Role of Ecosystems

With the signing of an agreement with the Antonio Núñez Jiménez Foundation of Nature and Man (FANJ), TNC became one of the few U.S.-based organizations to establish a formal partnership with a Cuban institution. **This partnership represents a significant milestone in the advancement of conservation efforts in Cuba and, as one of its primarily goals, will help raise awareness about the role of ecosystems in building resilience to the impacts of climate change.**

TNC and FANJ are developing and deploying a communications campaign that aims to build support among coastal communities for ecosystem-based efforts to increase climate resilience. By highlighting the fundamental role that coral reefs and mangroves play in protecting communities and sustaining livelihoods, the campaign will engage those that are most dependent on these ecosystems in the hard work of conserving them.

## Building a Sustainable Future

With over two decades of experience guiding conservation initiatives in Cuba, TNC continues to make strides protecting the country's remarkable biodiversity. Working closely with partners, TNC will help empower Cuba to effectively integrate an ecosystem-based approach into the design and implementation of its long-term conservation initiatives. **Together, we can create resilience in the face of a changing climate and a bright future for the country's vibrant natural resources and the people who depend on them.**



**OUR MISSION:** TO CONSERVE THE LANDS AND WATERS ON WHICH ALL LIFE DEPENDS



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