The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

CONSERVATION SCIENCE IN
Mesoamerica and the Caribbean

OVERVIEW OF THE SCIENCE PROGRAM

Assessments, plans, priorities, strategies, measures, research, information systems, tools, techniques, learning and adaptive management - all these elements guide The Nature Conservancy's science approach in the Mexico, Central America and the Caribbean. By investing in science and applying the principles of Conservation by Design scientists and practitioners provide direct support to diverse partners such as governments, indigenous peoples, landowners, resource managers, corporate organizations and communities of farmers and fishermen, as they make decisions with implications for biodiversity conservation and sustainable human development.

Each year, several thousand olive-ridley turtles leave the ocean mysteriously at the same time to nest on sandy beaches in Costa Rica and Mexico. Although scientists have so far been unsuccessful in finding an external catalyst for the nesting exodus, they have been successful in determining that many of the eggs never hatch due, in some cases, to natural predators, but also to domestic animals and people who patronize coastal hotels or collect eggs for their believed aphrodisiac qualities. Adult turtles are also harvested for leather.

The olive-ridley sea turtle is one of many species that depend for their survival on the protection of lands and waters in Mesoamerica -which includes Mexico and Central America- and the insular Caribbean.


An olive-ridley sea turtle on a Costa Rican beach. © Yamil S‡enz


A jaguar in the tropical moist forest. © Yamil S‡enz

Without appropriate action this species is in danger. The Nature Conservancy is dedicated to providing conservation science support for decision-making, urgently needed to preserve plants and animals such as the endangered olive-ridley turtle, as well as the ecological communities, that represent the region´s diversity of life.

Mesoamerica and the Caribbean are extraordinarily rich, both in terms of biological and cultural diversity. The region includes a wide range of magnificent ecosystems, ranging from tropical moist forests to deserts, and from glacial lakes and highland rivers to coral reefs. These systems house numerous communities of plants, animals, and micro-organisms on which people depend on for their livelihoods, the clean water and other resources essential to their well-being.

At present, Conservancy scientists in Mesoamerica and the Caribbean work in the following countries: Bahamas, Belize, Costa Rica, Dominican Republic, Grenada, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Vincent & The Grenadines, and the British and U.S. Virgin Islands.

The mission of The Nature Conservancy is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

Countries in Mesoamerica and the Caribbean where The Nature Conservancy works.

Conservation by Design

Conservation by Design is the Conservancy's science-based, flagship framework for fulfilling its mission. It represents an integration of our organizational values, attributes and our unique approach to conservation that together create our niche in the conservation community. It shows us where to work and what to conserve ("How much biodiversity is enough?"), what strategies we should use and how effective we have been over time, while sustaining the hope that conservation efforts can succeed.

By applying the Conservation by Design framework to science-based conservation in Mesoamerica and the Caribbean, the Conservancy has been able to develop a key science-support strategy for the region. This strategy can be broken down into eight actions, all part of the iterative and adaptive conservation approach that operates at multiple scales, from local to regional and global.

GOAL: by 2015, The Nature Conservancy will work with others to ensure the effective conservation of places that represent at least 10 percent of every major habitat type on Earth.

Regional Habitat Assessments

Scientists in Mesoamerica and the Caribbean are contributing towards the Conservancy's 2015 Goal. They are assessing the conservation status of the region's 7 terrestrial, 5 freshwater and 4 marine major habitat types, distributed over 6 biogeographical realms. These assessments are urgently needed for setting conservation goals and priorities among ecoregions. In 2006, a pioneering regional habitat assessment informed the development of the first 3-year 2015-goal implementation plan for Mesoamerica and the Caribbean, offering the basis for a compelling regional conservation agenda and effective strategies.

REALM: very large unit with unifying features of bio-geography, fauna and flora. There are 8 terrestrial/ freshwater and 12 marine realms in the world.

MAJOR HABITAT TYPE: a grouping of ecoregions with the same dominant ecosystems. Major habitat types reflect the broadest ecological patterns of biological organization and diversity on Earth.

Spider monkey. © Yamil S‡enz

Ecoregional Assessments

A total of 137 ecoregions occur in Mesoamerica and the Caribbean, spread over terrestrial (76), freshwater (43), and marine (18) environments. A conservation blueprint that includes how much of what must be conserved, and where, must be developed for each prioritized crisis and opportunity ecoregion. The Conservancy is currently involved in a dozen ecoregional assessments (ERAs) in the region, in order to set geographic conservation priorities within those ecoregions. Most of these assessments include multiple ecoregions.

ECOREGION: a large area of land or water that contains a geographically distinct assemblage of natural communities, and is differentiated by climate, subsurface geology, physiography, hydrology, soils, and vegetation.

Conservation Action Planning

Conservation Action Planning (CAP) is meant to help conservation projects prioritize, develop strategies, take action, and measure results, and then adapt and learn over time. Scientists are working with partners to develop CAPs for prioritized terrestrial, freshwater and marine action sites in Mesoamerica and the Caribbean, making sure these CAPs serve as the best basis for joint implementation, investment and measures on-the-ground and in-the-water. The CAP learning approach includes a capacity building component facilitated through the Conservancy´s Efroymson Network of conservation planning coaches who work at key sites for conservation action. In Mesoamerica and the Caribbean region

Conducting an ecoregional assessment for Central AmericaÕs conservation blueprint. © Lenin Corrales

Efroymson coaches and mentors organize peer review workshops that allow practitioners to create, test and share innovative ways to apply the conservation approach to particular habitat types and site-level threats and strategies among a number of projects and programs.

Protected Area Gap Assessments

At the Seventh Conference of the Parties (CoP-7) to the UN Convention on Biological Diversity (CBD) in 2004, 188 governments around the World recognized the paramount importance of protected areas as a means to secure the planet´s biodiversity. They committed to building ecologically representative and effectively managed systems of protected areas across habitats. They recognized the need to address the massive gaps in the ecological coverage of protected area systems that exist in every country.

To catalyze this effort, the Conservancy and partners in Mesoamerica and the Caribbean -as well as elsewhere around the world- have embarked on a close collaboration with partners to conduct national gap assessments of protected area systems in the region´s countries where National Implementation Support Partnerships or NISP agreements have been signed (about ten in Mesoamerica and the Caribbean alone!). Scientists and technicians are currently developing these rigorous, science-based gap assessments that will enable the signatory countries to meet their CoP-7 (and CoP-8) commitments within the framework of the Convention´s Program of Work on Protected Areas.

Conservation Information Systems

Effective management of a centralized but redundant, standardized data and information system is a key component of conservation success. It includes an integrated and widely accessible regional database, which contains available geospatial and tabular data, information, knowledge, tools and techniques generated through habitat and ecoregional assessments, conservation area planning, project management, and other conservation efforts. Such a Conservation Information System (CIS) will allow for tracking of conservation progress and monitoring of threat status.

Conservation Knowledge and Tools

Successful conservation strategies rely on extensive rigorous knowledge and research as well as on tools to capitalize on that knowledge. Key tools and practices include forest fire monitoring in southern Mexico, ecoagricultural techniques at the forest frontier in Central America, and a readily available decision support system for marine conservation in the greater Caribbean basin. Predictive modeling tools needed to develop future scenarios of global environmental changes -such as climate change and land use change- and understanding their regional impact on biodiversity will be developed in cooperation with research centers and other organizations, to better inform decision making in the long term.

Measuring Conservation Results

To inform conservation investments, the Conservancy is developing methods to measure conservation results at ecoregional and site scales over time. Key questions we are addressing are ″How is biodiversity doing?″ and ″Are the conservation actions we are taking having their intended impact?″

Osa Peninsula, Costa Rica. © Yamil Saenz

These questions help us to evaluate conservation progress for three conditions of effective conservation: biodiversity viability, threat status, and conservation management status. Current examples of measuring conservation results meant to inform conservation decision making in Mesoamerica include monitoring of changes in dense forest cover on the Yucatan Peninsula, and changes in jaguar populations found in Panama and Costa Rica.

EFFECTIVE CONSERVATION: the combination of three conditions: species, natural communities, and ecological systems are viable for the long-term; critical threats to that biodiversity are abated; and effective conservation management is securely in place.

Working with Partners to Achieve Common Goals

The Conservancy´s mission relies on collaboration with a variety of partners. The role of the science program is to serve as a hub of conservation data, information, knowledge, technology, tools, and planning, strategies, and measures that take into account the region as a whole and not just a single target species or ecological system. By working with partners, the region´s science program prioritizes major habitat types and ecoregions, and plans for their conservation. It also dispenses technical and scientific support to other Conservancy programs and partners in the region, including academic organizations and research institutions, through data and information gathering, processing, and sharing.

Science-Based Action and Lasting Results

One example of a science-based conservation effort currently underway can

Fishermen in Jamaica. © Brandon Hay

be found in the Bahamas and Jamaica. Fishermen have been overfishing at specific places in the ocean where they have found many species of fish congregating in large numbers. Conservancy scientists realized these fishermen had found places where many species of fish come to spawn year after year. The fishermen were therefore not only fishing out hundreds of fish in a day, but also removing those fish that were reproducing. In response, the Conservancy began work with partners to host workshops for the fishermen, educating them about sustainable fishery while learning about the needs of the fisherman. Ultimately, the Conservancy and the fishermen want the same thing: many fish to be available in the future. But only through working together can the two groups find a solution that both protects the fish populations and protects the livelihoods of the Caribbean fisherman. And science lies at the basis of this success.

For additional information:

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