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Authors

Medina García, Minneth Beatriz
Sánchez Hernandez, Juana Iris
Argleben, Maite Arce

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Maya Communities Preserve the Bioculturality of the Landscape and Lead Territory Management in Mexico: A Model of Indigenous Co-Stewardship of Public Lands

MINNETH BEATRIZ MEDINA GARCÍA,
JUANA IRIS SÁNCHEZ HERNANDEZ, and MAITE ARCE ARGLEBEN

The United Nations Environment Program recognizes that at least a quarter of the world's land surface is owned by Indigenous Peoples and Local Communities (IPLCs), where nature is degrading at a slower rate than in other parts of the world. Meanwhile, according to the Intergovernmental Panel on Climate Change, the climate crisis is having a direct impact on the livelihoods that sustain the permanence of these people.

On an international level, it is known that the best-preserved biodiversity reserves are those managed by Indigenous Peoples, with Indigenous communities being those who best know how to manage their resources and preserve them in the most sustainable way.

This evidence leaves no room for doubt that work on conservation issues promoted by any organization, state, or private entity must include the IPLC framework of respecting human rights, the sustainability of life and the life-supporting systems on Earth, and a long-term vision.

The recognition of the rights of Indigenous Peoples is critical to support decision-making in the strategies that international organizations carry out for the preservation and conservation of biodiversity and life-supporting systems. This article describes the collaborative experience among Hispanic Access Foundation, The Nature Conservancy (TNC), and the Puuc Intermunicipal Biocultural Board (Junta Intermunicipal Biocultural del Puuc; JIBIOPUUC),

serving as an example for appropriate and relevant conservation models for the ecosystems we wish to protect. Indigenous populations thus become strategic stewardship leaders for permanent conservation that respects the human rights of Indigenous Peoples.

BIOCULTURAL MANAGEMENT: A MODEL OF INDIGENOUS CO-STEWARDSHIP OF PUBLIC LANDS

The biocultural management model of the landscape and territory of the Maya Indigenous communities was highlighted at the Indigenous Co-Stewardship of Public Lands: Lessons for the Future workshop in California on February 21, 2024. The event was hosted by the Federated Indians of Graton Rancheria and co-sponsored by the California Biodiversity Network and the California Natural Resources Agency with the participation of the United States Department of the Interior. The participation of Minneth Beatriz Medina García, director of JIBIOPUUC, and Juana Iris Sánchez Hernández, community forestry development specialist at TNC in Mexico, was made possible with support from Hispanic Access Foundation, a US-based national non-profit organization. With a mission to connect Latinos with partners and opportunities, improve lives, and create an equitable society, Hispanic Access Foundation works to provide communities with access, capacity, and resources to support their work to protect natural resources. Hispanic Access Foundation shepherded the safe participation of these forward-looking women at the workshop to share their experiences and tell their stories as they lead conservation efforts and defend

Minneth Beatriz Medina García, Puuc Biocultural Intermunicipal Council

Juana Iris Sánchez Hernandez, The Nature Conservancy in Mexico

CORRESPONDING AUTHOR **Maite Arce Argleben**, Hispanic Access Foundation, 1030 15th Street NW, B/1-150, Washington, DC 20005 USA; maite@hispanicaccess.org

public lands in a space that is increasingly targeted by organized crime syndicates.

The collaboration aims to promote the exchange of knowledge and experiences between Indigenous communities in the United States and Mexico. By working together, these communities foster a deeper understanding and respect for each other's origins, and encourage the development of conservation mechanisms and sustainable financing that is essential to guaranteeing the long-term preservation of nature.

To better understand how US conservation organizations can effectively work with organizations using locally designed collaborative models in different parts of the world, the process of creating the Puuc Biocultural Reserve will be described, as well as the role that a respectful approach to the rights of Indigenous Peoples and conservation can play in long-term conservation.

TNC'S ROLE IN THE CONSERVATION OF MEXICO'S ECOSYSTEM

IPLCs are vital leaders in finding lasting solutions to the most pressing challenges to the environment and human well-being. IPLCs manage or have tenure rights to more than 25% of the world's land¹ and have claims to twice that amount that are not yet legally recognized.² This includes interconnected systems of forests, grasslands, wetlands, rivers, lakes, water tables, and coasts. With territories hosting more than 24% of the world's tropical forest carbon³ and much of the world's biodiversity,⁴ and with almost 32 million people in developing countries working as small-scale fishers,⁵ IPLCs are among TNC's most important partners. They have proven to be the most effective stewards of nature, achieving greater conservation outcomes and maintaining more biodiversity than government-protected areas.^{6, 7}

TNC is a global non-profit environmental organization working to create a world where people and nature can thrive, with a mission that encompasses inclusion, collaboration, and support for the original and current stewards of the Earth's natural systems.⁸ Founded in the United States in 1951,

TNC has grown to become one of the world's most effective and far-reaching environmental organizations. Through more than one million members and the efforts of its diverse staff, including more than 400 scientists, TNC influences conservation in 76 countries and territories—37 through direct conservation work and 39 through partners.

Mexico, a country of intercultural encounters and biocultural diversity, ranks fifth in the world in terms of its wealth of plants and animals, and seventh in terms of endemism. It has 68 Indigenous languages and 364 spoken variants. It is one of the seven major centers of origin of agriculture, domestication of plants and animals, and agricultural diversification. Around 30% of its population is Indigenous, rural, or Afro-Mestizo.⁹

Mexico's IPLCs¹⁰ and environmentalists from all walks of life have set an example of conservation and innovation informed by *Biocultura* (Bioculture), which is the association between biological, linguistic, and cultural diversity. TNC builds on those traditions to innovate and create synergetic mutualism with conservation and the local economy.

LA SELVA MAYA

After the Amazon, the *Selva Maya* (Maya Forest), which covers an area of over 85,480,000 acres in Mexico, Belize and northern Guatemala, is the largest tropical forest in the Americas. It provides refuge to numerous unique and endangered mammal species, such as the white-lipped

▼ The Selva Maya is the second largest tropical forest in the Americas. JEO RIIS, INTERNATIONAL LEAGUE OF CONSERVATION PHOTOGRAPHERS (LCP) / WIKIMEDIA COMMONS



peccary, tapir, and howler monkey. Jaguar tracks can often be seen on the forest floor. In addition, it is home to almost 400 species of birds, including the scarlet macaw and harpy eagle, and, at the peak of the winter migratory months, welcomes several million visiting birds.

The forest is also home to Maya communities with an ancestral legacy that continue to practice traditional agricultural techniques¹¹ to care for the forest as their ancestors did for generations. Their agricultural heritage is recognized by the Food and Agriculture Organization of the United Nations (FAO) as being globally significant.¹²

However, the pressures affecting this region are more significant than ever before. Unplanned urban expansion destroys forests and dunes. The use of pesticides eliminates pollinators on which the forest and agriculture depend. The establishment of pig and chicken farms concentrate high levels of fast-growing hormones and chemical pollutants on an easily permeable karst subsoil in areas of cenotes (natural sinkholes) or natural water sources. Coastal areas of the Selva Maya are also contaminated by sewage, fouling water on which corals depend. Traditional small-scale production is giving way to extensive agricultural and factory-farm livestock systems, which transform the landscape, threatening biodiversity and soil health.

To a large extent, the Selva Maya survives because it is still deeply connected to the cultural and productive practices of rural communities of Indigenous descent.

Added to the above is the deforestation of precious wood species by organized crime, as well as regional megaprojects, which have caused a high impact, putting at risk the Selva Maya, the fauna that inhabits it, and the IPLCs that work to preserve it.

To address these challenges, TNC works with all sectors to promote sustainable practices in agriculture and forestry, and helps implement science-based conservation actions. Its efforts in the Selva Maya seek to create the necessary conditions for the region to stop being a hotbed of deforestation and instead become consolidated as a green economy that benefits people and nature.

In Mexico, almost half of forest areas belong to communities. In the Selva Maya of the Yucatan Peninsula, this proportion increases to 61%,¹³ indicating that rural communities, whose livelihoods depend deeply on this diverse ecosystem, have the capacity to make decisions to define their destiny. However, they face numerous challenges. The whiplash of extreme weather events stemming from the climate crisis, such as pronounced droughts, irregular rain cycles, and hurricanes, endanger food security and make the landscape and people even more vulnerable.

To a large extent, the Selva Maya survives because it is still deeply connected to the cultural and productive practices of rural communities of Indigenous descent. Traditional agricultural and agroforestry systems, such as the *Milpa Maya* (a polyculture that constitutes a living and dynamic space nourished by genetic resources, as well as by the variety of corn, beans, squash, chili peppers, and other plants communities cultivate, Maya orchards or plots, and beekeeping. All are compatible with the protection and sustainable management of resources and landscapes.

These high-value practices are also rapidly transforming as new forms of commercial production, supported by government policies and subsidies, put pressure on communities to reconsider their livelihood strategies. In response to these changes, community leaders, farmers, foresters, beekeepers, ranchers, youth, and women from across the Yucatan Peninsula collaborate with TNC and other non-governmental organizations (such as JIBIOPUUC, PRONATURA Península de Yucatán (PPY), Red de Mujeres y Hombres por una opinión con perspectiva de género en Campeche (REDMYH AC; Network of Women and Men for an opinion with a gender perspective in Campeche), GIPS BACAB AC, Red de Ejidos Productores de Servicios Ambientales (REPSEAM; Network of Ejidos Producers of Environmental Services), among others) to test innovative production practices, invest resources to promote and monitor community conservation programs, and learn new skills.

TNC'S VOICE, CHOICE, ACTION FRAMEWORK

TNC is committed to raising awareness about the history and lasting impacts of colonialism, including its own contributions as an organization to this history and the resulting responsibilities, including building alliances based on respect, equity, open dialogue, integrity, and mutual accountability.

Furthermore, TNC recognizes that its activities as a land-owning and land-managing organization, with its private property systems and norms, as well as the protection and management of lands and waters that have been at the heart of its work, have come at a high price for Indigenous Peoples. TNC therefore seeks to acknowledge and recognize the history, responsibility, and institutional commitment of traditional guardians—past, present, and emerging.

The Voice, Choice, Action (VCA) Framework is TNC's common approach to supporting Indigenous and local community authority and capacity in natural resource management and decision-making (see *Voice, Choice, Action (VCA) Framework: A Guide to Indigenous and Community-Led Conservation for Conservation Practitioners*). It is underpinned by the understanding that the health of the natural world and the well-being of people are inextricably linked. This goes beyond the concept of ecosystem services (i.e., the provisioning, regulating, and supporting functions that the environment provides to people) to an integrated, holistic view that incorporates the different circles of relationships and feedback in the social-ecological system.

TNC's work with IPLCs is grounded in relationship-building, respect for self-determination, establishing trust, and focusing on shared interests. TNC's principles centered on collaboration include: Indigenous and community leadership; diversity and inclusion; reciprocity; communication and accountability; and flexibility, adaptability, and patience.

The VCA Framework is built on four pillars: rights, capacity, decision-making and livelihoods, which represent the characteristics necessary for successful community-led conservation. Indeed, a recent systematic review and analysis suggests that the greater the presence of these four pillars, the greater the likelihood of successful joint environmental and socio-economic outcomes.¹⁴ While equity, local knowledge and sustainability represent the critical enabling conditions for long-lasting community-led conservation, "ALL pillars and building blocks are interconnected and interdependent, and are necessary to achieve lasting positive outcomes for people and nature" (VCA Spanish version, p. 13).

TERRITORIAL INNOVATION NETWORK LEARNING MOVEMENT

Collective learning is enhanced through the constant interaction of people who can reach a common vision stemming from shared territory and landscapes with a deep understanding of challenges and opportunities.

The VCA Framework is built on four pillars: rights, capacity, decision-making and livelihoods, which represent the characteristics necessary for successful community-led conservation.

Under these premises, the Territorial Innovation Network Learning Movement (or RITER, the Spanish acronym) was built and co-designed by TNC and partners. RITER includes multi-stakeholder platforms with productive conservation objectives to achieve comprehensive landscape management. RITER thus promotes sustainable rural development, the exchange of knowledge, good practices, and sustainable production systems, connecting producers with science, research, rural extension services, and markets. It is an interdisciplinary approach that considers the geographic and socioeconomic conditions of a territory to manage its natural resources (soil, water, and forest) with the aim of achieving production, conservation and well-being goals for communities.

Through RITER in the Puuc region in Mexico's Yucatan Peninsula, and in partnership with Maya Indigenous people, work has been done to strengthen capacities in silvopastoral livestock farming with the goal of reducing the growth of the agricultural frontier, restoring degraded soils, and converting more than 49,000 acres of paddocks to regenerative livestock practices, seeking to create carbon reservoirs and to conserve the landscape. Efforts are also made for collaborative work with beekeepers and people working in meliponiculture (breeding native stingless bees) through the Selva Maya project. RITER guarantees the conservation of foraging bee zones with high forest value and the addition of measures to encourage productive restoration, as well as the designation of volunteer conservation areas by means of financial agreements that promote local environmental service mechanisms. Together, these encourage the protection and increase of forests with vast environmental and social co-benefits linked to food safety, the conservation of local agrobiodiversity, and biodiversity in general, above all in communities at high risk of environmental deforestation.

TNC AND JIBIOPUUC CO-CREATE MEXICO'S TERRITORIAL INNOVATION CENTERS

A key element of the physical infrastructure of TNC

Mexico's RITER are the CITERs, the Spanish acronym for Territorial Innovation Centers. They are the physical spaces where the individuals within the network interact. Training, field demonstrations, and exchange of knowledge, technology, and information are carried out here. In these spaces, rural producers who practice activities such as agriculture, livestock, and forest management meet with researchers, decision-makers, extension workers, input suppliers, and other key stakeholders for the above purposes and to create new ways of using resources more efficiently.

CITERs serve as innovation laboratories to diagnose problems, identify opportunities, and find ways to produce and conserve at the same time. This model is implemented through strategic local partners who emphasize work based on bioculturality.

Such is the case of JIBIOPUUC, which has evaluated its own configuration in collaboration with TNC. As noted earlier, JIBIOPUUC is the Intermunicipal Biocultural Board of a biocultural reserve in the northwest region of the Yucatan Peninsula known as the Puuc. Under TNC's VCA framework, together with other strategic partners, JIBIOPUUC finances and supports a model of sustainable development, autonomy, territory defense, and the conservation of tropical forests, while also conserving and respecting the Maya culture.

JIBIOPUUC is a leading example of support for strategic local partners that promote an Indigenous community-led conservation model. Its mission is to protect and conserve the region's forest area, biodiversity, and Indigenous heritage. On January 25, 2016, the first cooperative agreement was signed between TNC and JIBIOPUUC, with the aim of developing and strengthening capacities for the strategic implementation of Reducing Emissions from Deforestation and Environmental Degradation (REDD+).¹⁵ Since then, the relationship between TNC and JIBIOPUUC has been significant, promoting capacities, strengthening communities in decision-making, and encouraging collaboration mechanisms for conservation, thereby empowering communities and local groups to achieve the inclusion of vulnerable groups from a gender perspective.

JIBIOPUUC, with support from TNC, has promoted projects with green financing as a core strategy to conserve permanent forest territories. It commits to addressing priority Indigenous areas and communities for conservation, while at the same time reducing

socioeconomic pressure on the forests, with Indigenous communities and *ejidos* (a land tenancy system unique to Mexico in which a piece of land is farmed communally under a system supported by the state) as the primary beneficiaries.

With the inclusion of women and young people from the community in decision-making—called “conserving producing with inclusion”—products and services are created through traditional practices and techniques, which form part of the local agro-food culture and cosmovision/worldview. For example, the *Ich Kool Milpa Maya*, designated as one of FAO's *Sistemas Importantes del Patrimonio Agrícola Mundial* (SIPAM; Globally Important Agricultural Heritage Systems), promotes beekeeping by means of participatory certifications and a regional brand, in such a way that natural capital is revalued on an economic and social level with the support of public-private investments.

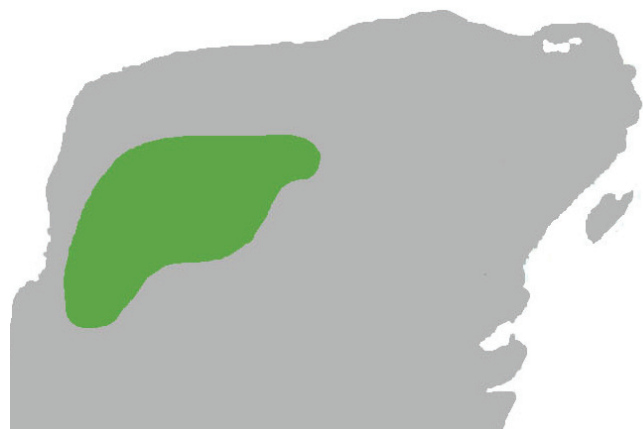
THE PUUC REGION: WHERE INDIGENOUS COMMUNITY-LED CONSERVATION MATTERS THE MOST

The Puuc region is an archaeological and biocultural region in the northwest of the Yucatan Peninsula. Characterized by a physiography of highlands and the greatest topographical contrast in the state, the area is home to 104 Maya families, 238 species of fauna, and 603 species of flora.

It consists of four main types of vegetation: lowland deciduous forest, which is predominant; lowland thorny sub-deciduous forest; medium deciduous forest; and medium sub-deciduous forest. In addition, there are some small savannas with hydrophilic elements.

The majority of the fauna species in the region are under the risk category in NOM-059-SEMARNAT-2001

▼ The Puuc Region in Mexico's Yucatan Peninsula. MABARLABIN / WIKIMEDIA COMMONS



(a system of regulation by the Mexican Secretariat of Environment and Natural Resources, the national environment ministry, that manages at-risk native flora and fauna, protects them, and determines where they fall on the endangered species list). Fourteen are in danger of extinction, 24 are under special protection, and five are at risk of extinction.

The fauna in the region includes 14 species of amphibians, 52 of reptiles, 247 of birds, and 63 of mammals, including five of the six species of felines found in Mexico, among them the jaguar. It is important to note that of the mammal species, four are endangered, five are at risk of extinction, and three are endemic. Overall, there are 19 endemic fauna species.

Due to its geographic positioning, the region naturally integrates the connectivity of natural protected areas of great peninsular relevance: to the south, Calakmul, Balam Kin, Balam Ku, and Balam Kaax; to the southeast, Otoch Maax Yetel Koh and Sian Ka'an; and to the northeast, Celestún and El Palmar. The area has cultural and historical characteristics that originate from the times of the ancient Maya with important ceremonial centers; among the highlights are Oxkintok, Uxmal, Kabah, Sayil, Labna, Xlapak, and Chacmultún, as well as other vestiges of Maya architectonic buildings distributed throughout the entire territory.

The Puuc region is well poised to advance bold conservation action since the region historically leverages the many benefits from the intersectionality of its economy, its rich natural resources, its unique biodiversity, its history and origin, its architectural heritage, its vocations, and its productive agricultural and livestock capacity. In addition to its biocultural wealth and as a recharge zone for aquifers in the Yucatan Peninsula, the Puuc region possesses a tremendous potential for the production of environmental services.

INDIGENOUS-LED BIOCULTURAL STATE RESERVE

In 2011,¹⁶ one of Mexico's most significant conservation innovations was generated in the Puuc region when *La Reserva Estatal Biocultural del Puuc* (Puuc Biocultural State Reserve, or REBP Reserve) was decreed. REBP Reserve is innovative because it centers the relationship of territory–landscape–Indigenous community.

REBP Reserve is the first of its kind in Mexico with this designation, with the sole objective being to preserve biodiversity in conjunction with the knowledge and culture of resource usage: that is to say, the bioculture presented by the inhabitants' ancestral wisdom. Its *Programa de Manejo de la Reserva* (Reserve Management Program) was published on April 14, 2022, after almost ten years of co-creation by the state together with Maya communities and local authorities.¹⁷

▼ The House of the Governor, Uxmal, Mexico. The building was constructed in the 10th century CE to commemorate the reign of Lord Chahk. It was used as a royal palace and administrative center. DENNIS JARVIS CC BY



REBP Reserve not only promotes the conservation of natural resources, but also the environmental services that these resources provide to the Indigenous communities that inhabit the Puuc region. In other words, conservation is not limited only to flora and fauna, but also to ways of life and the relationship between the landscape and local knowledge of land management, where culture, ancestral knowledge, and forms of production are the primary objects of integration for conservation, respecting local ways of life, patterns of consumption, and forms of organization.

REBP Reserve is a part of a larger biocultural corridor that extends to Central America.

MAYA COMMUNITIES LIVING IN REBP RESERVE

The biocultural wealth of the Puuc region is based on the history of living knowledge that generations of inhabitants of the Maya community have transmitted for centuries. Their knowledge regarding the natural cycles of the Selva Maya is a central element of their resilience and biocultural identity to this day. REBP Reserve has a high biocultural value that is much to the credit of the Indigenous populations who live there. They develop activities related to the traditional agroecosystems of the Milpa Maya, including meliponiculture and beekeeping. These communities are bound by cultural systems, including the Maya language and their beliefs (religion, rituals, and origin stories), which are reflected in their archaeological sites, crafts, festivities, clothing, music, traditional food, and historical awareness, among other expressions of heritage.

The biocultural wealth of the Puuc region is based on the history of living knowledge that generations of inhabitants of the Maya community have transmitted for centuries.

Seven communities can be found within the reserve's 335,682.516 acres, and about 40 more are adjacent to it, among them ejidos.

Agricultural and forestry activities are carried out in the region, and it is considered the main fruit-growing region of the Yucatan Peninsula. Many communities depend on timber and non-timber forest extraction, as well as the use of wildlife. These systems are complementary to each other, both in terms of income and the nourishment of the Maya family; as such, sustainable development in the region requires a joint vision, as in the traditional Milpa Maya.

GOVERNANCE STRUCTURE WITHIN REBP RESERVE: JIBIOPUUC

The reserve's governance structure is made up of a board of directors, a public governing body that allows decisions to be made in a joint and coordinated manner. The structure was designed to place conservation interests at the center. It functions as a coordinating mechanism between IPLCs, non-governmental organizations, and state and local government. The structure includes a citizen's council with a gender-inclusive perspective on

which all sectors of the population, including academia, are represented; local users' committees; and a Technical Directorate, which is its technical-operational arm in charge of executing the agreements.

On October 10, 2014, the agreement to create JIBIOPUUC,¹⁸ made up of the municipalities of Muna, Ticul, Santa Elena, Oxkutzcab and Tekax, was published in the Official Gazette of the State, thereby officially creating the organization. To date, three more municipalities—Tzucacab, Peto, and Yaxcabá—have also been honorarily incorporated into JIBIOPUUC.

The area of influence of JIBIOPUUC, including the eight municipalities, comprises 2,026,501.94 acres, an area that corresponds to 21% of the total surface of the entire state of Yucatán.

JIBIOPUUC is a decentralized public body (OPDI, in the Spanish acronym) that supports management and provides technical support to the municipalities that are part of the Intermunicipal Board, as well as to the Maya communities that are within REBP Reserve and its area of influence. JIBIOPUUC's role focuses on the coordination and agreement of projects, generating a direct impact on the territory.

JIBIOPUUC'S governance structure expands capacity to strengthen alliances between the various governments and stakeholders with decision-making power in the direct management of the reserve, and also creates the space for strategic initiatives at an international level, thereby generating institutional support. JIBIOPUUC also promotes constructive dialogue among Indigenous populations, accommodating their needs, concerns, and expectations, comprehensively solving development problems with transparency, equity, justice, and full respect for culture and human rights. It guarantees that the benefits derived from ecosystem services are distributed among the people in the broadest possible way, with emphasis on safeguards that guarantee the conservation of each community's own cultural elements.

GOVERNANCE SPACES

JIBIOPUUC, together with the Maya communities, work to strengthen governance at the landscape level by encouraging that decisions regarding all actions be made through consensus, participation, and equity. This work is conducted in four governance spaces by 159 agrarian communities dispersed across 166 locations in the

eight municipalities, which hold 77% of public lands for common use. Together these communities constitute the economic livelihood of the Puuc region.¹⁹

Local Governance. Governments at the territorial level that promote “good practices” to improve the quality of life of their inhabitants.

Environmental Governance. Encompasses regulations, practices, policies, and institutions that shape the way people interact with the environment as a common good.

Community Governance. Integrates communities the owners of the territory—in decision-making and implementation, achieving adequate management of resources and shared agreements.

Climate Governance. Considers what is required to address the impacts of climate change through mitigation and adaptation with multi-stakeholder and interdisciplinary perspectives.

STRATEGIC FRAMEWORK FOR CONSERVATION

JIBIOPUUC has defined six strategic areas that frame its activities and through which it collaborates in conservation of REBP Reserve:²⁰

- 1. Institutional and Financial Strengthening.** This area focuses on the capacities that JIBIOPUUC must attain to become a permanent organization.
- 2. Governance.** This area promotes participation on different levels, both among the key actors as well as the institutions and organizations that influence the region, seeking equitable, voluntary, and inclusive participation, and for JIBIOPUUC to be recognized as a space for cooperation and coordination.
- 3. Education with a Biocultural and Human Development Approach.** This area encourages respect for biodiversity, local knowledge, and traditional wisdom based on the identity of the region and its great natural wealth, especially supporting the conservation of Mayan language, foodways, and traditions.
- 4. Comprehensive Sustainable Development.** This area advances processes that achieve long-term permanence of resources, incentivizing the alignment of sustainable rural development policies and the conservation of forest ecosystems, in both socioeconomic and environmental dimensions, integrating vulnerable groups, developing value chains (e.g., milpa, beekeeping, meliponiculture, livestock, tourism, forestry, and crafts), and promoting ecosystem restoration.

- 5. Territory and Environmental Services.** The Puuc region is part of a geographic zone that is widely recognized for its ecosystem services, specifically hydrological, which are provided to the entire Yucatan Peninsula; pollination and cultural services are also recognized. It is in this strategic area that REBP Reserve is the center of action, and from where the communities and ejidos work for the conservation and preservation of their territories, under threats of deforestation, loss of resilience, and the dispossession of Indigenous Peoples’ lands.
- 6. Responsible Consumption and Market Integration.** In this last area, the results of all actions must be directly reflected in society and in the improvement of its way of life. For example, with respect to food security this strategic area promotes the integrated production, distribution, and consumption of products derived from the use of food. With respect to forest products, no matter whether timber-related or not, it is recognized that the Selva Maya is everyone’s responsibility. This strategic area is the place where society at large, producers of goods and services, decision-makers, and governments converge in an intergenerational way. Here, agroecological production practices elevate and respect traditional knowledge and conserve ecosystems, offering additional value to the consumer.

THREATS CONFRONTING AN AUDACIOUS CONSERVATION EFFORT

Over the last decades, a broad spectrum of issues have hindered the protection, conservation, and maintenance of REBP Reserve’s landscape and its corridors. Intense pressures threaten this audacious conservation effort, including deforestation, changes in use of land and soil for agriculture and cattle, as well as the illegal extraction of flora and fauna, e.g., escalating poaching and illegal logging for timber with high commercial value. Adding to these threats, the younger generations have less interest in maintaining sustainable production practices or remaining among their Indigenous communities, causing increased migration of youth to bigger cities, especially abroad, with the United States of America being the main destination.

The younger generations have less interest in maintaining sustainable production practices or remaining among their Indigenous communities.

These facts have favored (1) the sale of ejido lands, such that they are no longer being passed down to the younger generations; (2) an increase in productive activities with high environmental impact, leaning more towards agro-industrial production; (3) loss of ecosystems and environmental services due to changes in use of soil and lands, often caused by wildfires provoked by illegal burns; (4) pollution of lands and water with agrochemicals and solid waste; (5) decreased local resilience to climate impacts, especially in long periods of drought or during intense rains that cause severe flooding and loss of livelihood; (6) lack of employment opportunities; (7) a general increase in people's vulnerability, above all among families headed by women without rights to the land and resources.

Thus, JIBIOPUUC, the communities that comprise it, and especially Maya leaders have undertaken actions to address challenges linked to conservation by giving value to local knowledge and practices, honoring the wisdom of Indigenous groups, and favoring territory defense. Even though it is the Indigenous people who have maintained the resources in the most conserved areas, conditions of great vulnerability and high threat from external pressures on natural and biocultural resources exist.

Since REBP Reserve provides continuity to the biological corridor that unites Mexico and Central America, given its strategic location and its cultural and economic importance in the region, multiple agricultural and economic projects have been developed. The productive programs have caused both positive and negative environmental impacts in the Puuc Region, which is why different national and local efforts have arisen to conserve this area.²¹

The conservation model of JIBIOPUUC and REBP Reserve is considered of great importance for state and local work, promoting sustainable living and long-term decision-making among the communities, and with respect for traditional ways of life.

Finally, it can be highlighted that through collaborations with communities and Indigenous Peoples, and with the dissemination of the importance of conservation, as has been done with TNC and recently with Hispanic Access Foundation, opportunities are created to promote actions to mitigate and adapt to a changing climate. Ancestral production techniques have been recognized and valued, empowering them through science and knowledge exchange. At the same time, respect for Indigenous Peoples' decisions regarding ways of life and the use

of resources is promoted on a territory level through stewardship of the biocultural landscape where women, youth, and children have better opportunities and make decisions over the conservation of their heritage.

ENDNOTES

1. Garnett, S.T., N.D. Burgess, J.E. Fa, Á. Fernández-Callazares, Z. Molnár, C.J. Robinson et al. 2018. A spatial overview of the global importance of Indigenous lands for conservation. *Nature Sustainability* 1: 369–374.
2. Rights and Resources Initiative. 2020. Estimate of the area of land and territories of Indigenous Peoples, local communities, and Afrodescendants where their rights have not been recognized. Technical report. Washington, DC: Rights & Resources Initiative. <https://rightsandresources.org/wp-content/uploads/Area-Study-v2021.pdf>
3. Rights and Resources Initiative, Woods Hole Research Center and World Resources Institute. 2016. Towards a global reference for carbon storage on collective lands: Updated analysis of the contributions of Indigenous Peoples and local communities to climate change mitigation. Washington, DC: Rights & Resources Initiative. <https://rightsandresources.org/wp-content/uploads/2016/10/Toward-a-Global-Baseline-of-Carbon-Storage-in-Collective-Lands-November-2016-RRI-WHRC-WRI-report.pdf>
4. Sobrevila, Claudia. 2008. *The Role of Indigenous Peoples in Biodiversity Conservation: The Natural but Often Forgotten Partners*. Washington, DC: World Bank.
4. World Bank Group. 2012. *Hidden Harvest: The Global Contribution of Capture Fisheries*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/515701468152718292/Hidden-harvest-the-global-contribution-of-capture-fisheries>
6. Stevens, C., R. Winterbottom, J. Springer, and K. Reyntar. 2014. *Securing Rights, Combating Climate Change*. Washington, DC: World Resources Institute.
7. Schuster, R., R.R. Germain, J.R. Bennett, N.J. Reo, and P. Arcese. 2019. Vertebrate biodiversity on Indigenous-managed lands in Australia, Brazil, and Canada equals that in protected areas. *Environmental Science & Policy* 101: 1–6.
8. Indigenous communities, nations and peoples are those that, having historical continuity with the societies prior to the invasion and colonization that developed in their territories, are considered different from other sectors of the societies that now prevail in those territories or in part from them. Furthermore, we recognize and reaffirm that Indigenous individuals must have access without discrimination to all human rights recognized by international legislation, and that Indigenous Peoples

- have collective rights that are essential for their existence, well-being, and integral development.
9. Toledo, Victor M., and Bassols Narciso. 2008. *Biocultural Memory: The Ecological Importance of Traditional Wisdom*. Barcelona: Icaria Editorial.
 10. Distinguishing “local communities” from “Indigenous Peoples”: Local communities often have a similar connection to lands, waters, and resources and a similar dependence on these for their culture and livelihoods, as well as for their common or community governance systems natural resources. However, those who make up local communities have not collectively identified as Indigenous Peoples. In this way, collective rights that are available to Indigenous Peoples under international law may not be applicable or available to local communities. However, TNC remains committed to defending the human rights of all the local communities .
 11. Mijangos-Cortés, J.O., J.L. Simá-Gómez, and E.M. Ku-Pech. 2019. Revalorizando a la milpa maya en Yucatán: Incremento de la capacidad productiva [Revaluing the Milpa Maya in Yucatán: Increase in productive capacity]. *CICY Herbarium* 11: 180–184. https://www.cicy.mx/Documentos/CICY/Desde_Herbario/2019/2019-09-12-Mijangos-Sima-Ku-Pech-Revalorizando-a-la-Milpa-Maya.pdf
 12. Recognition of the Milpa Maya as a Globally Important Agricultural Heritage System. <https://youtu.be/0ggKfCpCBzo?si=G4rS5-sXisTGklJC>
 13. The Nature Conservancy. 2022. Comunidades Maya. <https://www.nature.org/es-us/sobre-tnc/donde-trabajamos/tnc-en-latinoamerica/mexico/selva-maya/comunidades-maya/>
 14. Fariss, B., N. DeMello, K.A. Powlen, C.E. Latimer, Y. Masuda, and C.M. Kennedy. 2021. Identifying catalysts of success in community-based conservation. *Conservation Biology* 37(1): e13973. <https://doi.org/10.1111/cobi.13973>
 15. Set of strategic lines that simultaneously promote mitigation and adaptation actions, through comprehensive management of the territory that promotes low-carbon “Sustainable Rural Development (SRD)”, and therefore aims at a convergence between the environmental agenda and development. Government of Mexico. 2017. Redd+ en México. <https://www.gob.mx/conafor/documentos/redd-en-mexico#:~:text=En%20M%C3%A9xico%2C%20REDD%2B%20debe%20entenderse,que%20apunte%20a%20una%20convergencia>
 16. Official Gazette of the State of Yucatan [DOEY]. 2011. Decree 455/2011. https://www.yucatan.gob.mx/docs/diario_oficial/diarios/2011/2011-11-01.pdf
 17. Official Gazette of the State of Yucatan [DOEY]. 2022. Decree 485/2022. https://sds.yucatan.gob.mx/areas-naturales/documentos/2022-04-14_2_Decreto_Reserva_Estatal_Biocultural_del_Puuc.pdf
 18. Official Gazette of the State of Yucatan [DOEY]. 2014). Decree 32,712. https://www.yucatan.gob.mx/docs/diario_oficial/diarios/2014/2014-10-10_2.pdf
 19. National Agrarian Registry. 2014. Procedure for updating the indicator: Registered ejidal surface with lands designated for common use (p. 8). http://www.ran.gob.mx/ran/indic_bps/10-RAN_procedimiento_act_ind_SuperficieEjidalRegistradaconTierrasDestinadasalUC.pdf
 20. JIBIOPUUC. 2021. Update of the JIBIOPUUC Action Plan 2020-2024. <http://jibiopuuc.org.mx/wp-content/uploads/2021/10/Actualizacio%CC%81n-del-plan-de-accio%CC%81n-de-la-JIBIOPUUC-2020.pdf>
 21. G.A. Ortega et al. 2017. *Construcción institucional para promover el desarrollo sustentable: Región Puuc*. [Institutional Construction to Promote Sustainable Development: Puuc Region]. Washington, DC: US Agency for International Development et al. <http://jibiopuuc.org.mx/wp-content/uploads/2020/06/Puuc-ebook-Mayo-2017.pdf>