ANALYSIS OF TROPICAL FORESTS AND BIODIVERSITY IN MEXICO: FINAL REPORT

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ACRONYMS AND ABBREVIATIONS

A	Threatened (*Amenazada*)
ADS	Automated Directives System
ADVC	Areas Voluntarily Designated for Conservation (*Áreas Destinadas Voluntariamente a la Conservación*)
AFD	French Development Agency (*Agencia Francesa de Desarrollo*)
AFOLU	Agriculture, Forestry and Other Land Use
AGRINJAL	Agricultores Innovadores de Jalisco SPR
ANP/NPA	Natural Protected Area (*Área Natural Protegida*)
ANVCC	National Atlas of Vulnerability to Climate Change (*Atlas Nacional de Vulnerabilidad al Cambio Climático*)
BANXICO	Mexico's Central Bank (*Banco de México*)
BID	Interamerican Development Bank (Banco Interamericano de Desarrollo)
CBD	Convention of Biological Diversity
CBMM	Mexican Mesoamerican Biological Corridor (*Corredor Biológico Mesoamericano de México*)
CCMSS	Mexican Civil Council on Sustainable Forestry (*Consejo Civil Mexicano para la Silvicultura Sostenible*)
CDCS	Country Development Cooperation Strategy
CEDES	Ecology and Sustainable Development Commission for Sonora (*Comisión de Ecología y Desarrollo Sustentable del estado de Sonora*)
CEIBA	Interdisciplinary Center for Biodiversity and Environment (*Centro Interdisciplinario de Biodiversidad y Ambiente*)
CEMDA	Mexican Centre for Environmental Law (*Centro Mexicano de Derecho Ambiental*)
CESAVE	Sonora's Phytosanitary Local Committee (*Comité Estatal de Sanidad Vegetal de Sonora*)
CIBNOR	Center for Biological Research of the Northwest (*Centro de Investigaciones Biológicas del Noroeste*)
CICC	Interministerial Commission of Climate Change (*Comisión Intersecretarial de Cambio Climático*)
CIDRS	Interministerial Commission of Sustainable Rural Development (*Comisión Intersecretarial para el Desarrollo Rural Sustentable*)
CIMARES	Interministerial Commission for Sustainable Management of Coastlines and Oceans (*Comisión Intersecretarial para el Manejo Sustentable de Mares y Costas*)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora (Convención sobre el Comercio Internacional de Especies Amenazadas de Fauna y Flora Silvestres)

COBEN	Biodiversity Conservation Project in the Neovolcanic Axis (*Proyecto Conservación de la Biodiversidad en el Eje Neovolcánico*)
COBIOCOM	Biocultural Corridor of the Center-West of Mexico (*Corredor Biocultural del Centro Occidente de México*)
COLMEX	Colegio de México
CONABIO	National Commission for the Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*)
CONAFOR	National Forestry Commission (*Comisión Nacional Forestal*)
CONEVAL	National Council for the Evaluation of. Social Development Policy (*Consejo Nacional de Evaluación de la Política de Desarrollo Social*)
COP	Chief of Party
Cr	Critical Danger
CSO	Civil Society Organization
CUCSUR	University Center of the South Coast (*Centro Universitario de la Costa Sur*)
DO	Development Objective
ECOSUR	Southern Border College (Colegio de la Frontera Sur)
ELUP	Ecological land use plan
En	Endangered
ENAREDD+	National Strategy for the Reduction of Emissions from Deforestation and Forest Degradation (*Estrategia Nacional para la Reducción de Emisiones por Deforestación y Degradación*)
ENBioMEX	Mexico's National Biodiversity Strategy (Estrategia Nacional de Biodiversidad de México)
ENDESU	Natural Spaces and Sustainable Development (*Espacios Naturales y Desarrollo Sustentable*)
ERI	Emissions Reduction Initiative
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization
FONCET	El Truinfo Conservation Fund (Fondo de Conservación el Triunfo)
FY	Fiscal Year
GDP	Gross Domestic Product
GEF	Global Environmental Fund
GHG	Greenhouse Gas
GIS	Geographical Information System
GIZ	German Technical Cooperation Agency (Deutsche Gesellshaft für Internationale Zusammenarbeit)
GOM	Government of Mexico
HRS	Human Rights Specialist

INAH	National Institute of Anthropology and History (*Instituto Nacional de Antropología e Historia*)
INAPESCA	National Institute of Fishery (*Instituto Nacional de Pesca*)
INECC	National Institute of Ecology and Climate Change (*Instituto Nacional de Ecología y Cambio Climático*)
INEGI	National Institute of Statistics and Geography (*Instituto Nacional de Estadística y Geografía*)
INIFAP	National Institute for Agricultural, Livestock and Forestry Research (*Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias*)
IUCN	International Union for the Conservation of Nature
LGEEPA	General Law of Ecological Balance and Environmental Protection (*Ley General de Equilibrio Ecológico y Protección al Ambiente*)
LGDFS	General Law of Sustainable Forest Development (*Ley General de Desarrollo Rural Sustentable*)
MRV	Monitoring, Reporting and Verification
MS	Methodological Strategies
NGO	Non-Governmental Organization
NOM	Official Mexican Standards (*Norma Oficial Mexicana*)
NPA	Natural Protected Area (*Área Natural Protegida*)
OECD	Organization for Economic Cooperation and Development
P	In danger of extinction (*Peligro de Extinción*)
PACE	Action Programs for the Conservation of Species (*Programas de Acción para la Conservación de Especies*)
PES	Payment for Ecosystem Services
PND	National Development Plan (*Plan Nacional de Desarrollo*)
Pr	Subject of special protection (*Sujeto de Protección especial*)
PROCODES	Program of Conservation for Sustainable Development (*Programas de Conservación para el Desarrollo Sustentable*)
PROFEPA	Federal Attorney General for Environmental Protection (*Procuraduría Federal de Protección al Ambiente*)
PROFERTIL	Special Programme to Support the Consolidated Buying of Fertilizers (*Programa Especial de Apoyo a la Compra Consolidada de Fertilizantes*)
PRONAES	Solidarity Economy National Promoter (Promotora Nacional de Economía Solidaria)
REDD+	Reducing Emissions from Deforestation and Forest Degradation (*Reducción de Emisiones por Deforestación y Degradación*)
ROI	Return on Investment
RoLS	Rule of Law Specialist

SADER	Ministry of Agriculture and Rural Development (*Secretaría de Agricultura y Desarrollo Rural*)
SEDENA	Ministry of National Defense (*Secretaría de Defensa Nacional*)
SEMADET	Ministry of Environment and Territorial Development of Jalisco (*Secretaría de Medio Ambiente y Desarrollo Territorial de Jalisco*)
SEMARNAT	Ministry of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*)
SENASICA	National Service for Food Health, Safety and Quality (Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria)
SEPESCA	Ministry of Fishery and Aquaculture of Baja California (*Secretaría de Pesca y Acuacultura de Baja California*)
SNIARN	National System of Environmental and Natural Resources Information (Sistema Nacional de Información sobre Medio Ambiente y Recursos Naturales)
SO	Specific Objective
SOW	Statement of Work
TL	Team Leader
TNC	The Nature Conservancy
TPS	Productive Sustainable Territories (*Territorios Productivos Sustentables*)
UACH	Autonomous University of Chapingo (*Universidad Autónoma de Chapingo*)
UMA	Management Unit for Sustainable Use of Wildlife (Unidad de Manejo para la Conservación de Vida Silvestre)
UNDP	United Nations Development Programme (Programa de las Naciones Unidas para el Desarrollo)
UNODC	United Nations Office on Drugs and Crime
USAID	United States Agency for International Development
USD	United States Dollars
USFS	United States Forest Service
USG	United States Government
Vu	Vulnerable
WTO	World Trade Organization
WTTC	World Travel and Tourism Council
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

This analysis of tropical forests and biodiversity in Mexico is designed to inform the United States Agency for International Development (USAID) Mission to Mexico in developing its 2020-2025 Country Development Cooperation Strategy (CDCS) by analyzing two key issues:

- Actions necessary to conserve biological diversity and to conserve and sustainably manage tropical forests in Mexico; and
- The extent to which the supporting actions proposed for the Agency meet the needs identified.

This report attempts to identify the key changes in biodiversity and forests in Mexico since 2013 and provides USAID/Mexico with recommendations to support for biodiversity and forest conservation.

Section 1 provides a brief description of the purpose and the methodology used for the analysis. The Team performed a desk review of relevant documents, interviewed 85 stakeholders from 56 different institutions, and conducted field visits in the Yucatan Peninsula (Campeche and Quintana Roo), Jalisco and Sonora.

Sections 2 and 3 describe the country and regional context within Mexico. The Team developed detailed summaries and analyses of both terrestrial and marine ecosystems in the North, Center and South Regions, outlining conditions and threats to biodiversity and forest conservation.

Section 4 describes the threats to Mexico's biodiversity and tropical forests, using the categories identified by international consensus: (1) habitat loss and degradation; (2) over-exploitation; (3) spread of invasive species; (4) habitat pollution; and (5) climate change. The drivers, underlying causes and observed consequences are specified for each threat.

Section 5 describes Mexico´s relevant policy instruments, including a brief description of the country's protected area system, which is comprised of the different categories of Natural Protected Areas (NPA), as well as the management of critical biodiversity outside of protected areas. These include biological corridors, wetlands of international importance, ecological land use plans, watersheds, and sea turtle nesting beaches. Policy instruments available include Policies, Laws and Regulations, Planning Instruments as well as Economic and Market Instruments. The team include a Gap Analysis for the before mentioned instruments and an analysis of Productive models compatible with biodiversity and forest conservation.

Section 6 describes the actions necessary to conserve biodiversity and tropical forests. The team identified priority areas and issues where any project may be able to positively influence biodiversity, using models for statistical analysis to identify the influence of specific territorial management variables that indicate a degree of organizational and governance capacities on the ground.

Based on the literature review, interviews, site visits, and gap analysis, the analysis identified and ranked 39 actions according to how the action addresses the identified threats and gaps, as well; (b) how significantly it addresses the identified gaps, and (c)

how feasible it is in terms of political will, existing technical capabilities and economic cost of implementation.

Section 7 describes how the Mission's current activities are contributing to sustainable management and conservation of tropical forests and biodiversity according to the identified ranked actions. Due to current conditions and circumstances, the team observes significant opportunities for collaboration among stakeholders, particularly donors and civil society organizations, as well as to strengthen existing efforts and governance platforms.

Section 8 provides conclusions and recommendations. Ten recommendations emerge from this analysis. For each, the report describes impacts and suggests specific activities, potential actors to engage, locations where the action is most urgently needed, and the relation with other recommended priority actions. The role of the Agency's proposed support is also summarized. The ten recommendations are:

1. *Promote market-oriented schemes to provide incentives for conservation and sustainable use of biodiversity, particularly Management Units for Sustainable Use of Wildlife (UMAs) for hunting, fishing and breeding as profitable activities that preserve habitats and species.*

Experience has proven that these schemes are effectively address needs by providing economic incentives for engaging in conservation and sustainable use. For example, desert sheep hunting generates USD$40 million annually in the state of Sonora. The Mission does not currently promote UMAs.

2. *Promote diversification of productive activities to enhance profitability, sustainability and resilience.*

Including different productive activities in an area and/or farm reduces vulnerabilities and conserves soil and ecosystem services, while reducing producers' dependence on outside influences and avoiding counterproductive "one size fits all" approaches. The Mission is currently helping implement community-led sustainable farm and forestry businesses and sustainable practices in agroforestry and forest management. It can further expand diversification by identifying key crops and areas of interest, formalizing collaboration platforms, or communicating menus of technical alternatives as criteria for public programs.

3. *Promote producers' groups and cooperatives to achieve economies of scale.*

Mexico's many small and scattered farmers must operate at a larger scale to be profitable. Grouping producers reduces the transaction costs of technical assistance, financial services, input and transportation provision, thereby increasing their profitability. The Mission currently works under this line by building the capacity of community-based forest enterprises to reduce deforestation and forest degradation. USAID can strengthen its work by, for example, identifying additional market opportunities in priority regions, and working with potential partners for greater small farmer engagement.

4. *Build capacity for certification and standards programs for sustainable productive practices.*

Certification and standards programs have the potential to increase the market value and price stability of sustainably produced goods, thereby creating incentives for the implementation of sustainable practices. Currently, the Mission supports Rainforest Alliance programs for sustainable practices and enhances the capabilities of community-based forest enterprises. USAID can strengthen this line of action by promoting capacity-building and collaboration with organizations that have experience developing standards, or by raising awareness of sustainable land-based products.

5. *Document the value of ecosystem services to foster market mechanisms (e.g., insurance, genetic resources for product improvement)*

Valuating ecosystem services helps to engage the private sector and others by clarifying potential conservation investment risks and returns, while also providing incentives for conservation and sustainable use. USAID does not currently address valuation of ecosystem services through market mechanisms. It can do so by promoting regional and local studies for valuation of ecosystem services, communicating findings, and engaging potentially interested private entities (e.g. insurance companies, seed companies, and tourism and hotel sectors).

6. *Strengthen the capacity of regional and local governance or collaboration schemes, including inter-municipal and watershed councils, biocultural landscape bodies, ejidos and forest communities, among others.*

Strong governance schemes make it possible to articulate policies and actions, focus resources and prevent scattered efforts. It also contributes to building economies of scale. Currently, USAID supports better management of community forests and capacity-building for community-based forest enterprises, and can expand this line of action by: (a) providing facilitation to identify and engage on-site conveners; (b) joining efforts with other donors; (c) promoting coordination/working groups for key issues and landscapes; and (d) using social media or other methods to raise awareness of sustainable land-based products.

7. *Advance use of biological corridors and projects already designed or in place.*

Comprehensive landscape planning and management in specific biological corridors is more effective than sectoral or other administrative approaches because it helps foster connectivity of ecosystems as well as market, cultural and innovation opportunities at scale. USAID currently supports Rainforest Alliance projects in Oaxaca, among others, and provides ongoing support to the National Forestry Commission (CONAFOR) for implementing a national forest inventory and monitoring system of greenhouse house gas (GHG) emissions. Nonetheless, evaluating and including biological connectivity criteria will be useful when implementing all of the Mission's projects.

8. *Integrate all instruments outside National Protected Areas through a comprehensive conservation strategy.*

Developing conservation strategies for wetlands of international importance (RAMSAR[1] sites), UMAs, and Areas Voluntarily Designated for Conservation (ADVCs) could generate additional much-needed income and increases the potential for economies of scale. USAID does not currently consider evaluating the integration of conservation instruments as part of a comprehensive strategy for Mexico, but could potentially serve as a convener that supports actors from private, public and social sectors to develop common goals and strategies.

9. *Engage the private sector by linking biodiversity and forest conservation to companies' core businesses and invest in their sustainable performance capabilities.*

Effectively engaging the private sector involves documenting and communicating market intelligence regarding sustainable sourcing in terms of market opportunities, reputation risks, reliable sourcing, and climate risk resilience. Private sector involvement in conservation efforts entails understanding the companies' pressing challenges, exploring ad hoc mechanisms and fostering collaboration between stakeholders. USAID already works with specific sectors and value chains, assists in developing public-private partnerships for sustainable sourcing through the Rainforest Alliance, collaborates on carbon policy design with both the public and private sectors, and includes private-sector matching requirements in its grants.

10. *Strengthen enforcement capacities for existing laws and regulations.*

Estimates indicate that almost half of the timber sold in Mexico is from illegal sources. Enforcement is both weak and essential to developing the market potential of sustainably produced goods. USAID currently works to strengthen the legal, institutional, and public policy framework and the capacities in all sectors to use best practices for more participatory planning of energy projects. USAID can expand its current activities by enhancing resources and technical capacity through training programs, monitoring, surveillance and intelligence systems to increase information technologies as well as the improvement of coordination and operations capacity among agencies, particularly in the forest sector.

Finally, the study highlights the existing opportunities for synergies and collaboration between Development Objective (DO) 4 and other DOs to enhance biodiversity and forest conservation in Mexico, which are important given the following circumstances:

- Current smaller federal government budgets are weakening institutions and leave room for illegal activities;
- Lack of transparency in sourcing (crops, timber, etc.) leads to overexploitation and opportunities for illegal activities (e.g. money laundering);

[1] A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention. The Convention on Wetlands, known as the Ramsar Convention, is an intergovernmental environmental treaty that provides for national action and international cooperation regarding the conservation of wetlands, and wise sustainable use of their resources.

- Inadequate law enforcement capabilities in areas with environmental problems lead to impunity; and
- Stronger civil society is a key pillar for protection of biodiversity and forests.

This analysis of tropical forests and biodiversity in Mexico is an opportunity for USAID/Mexico to better understand the strategic linkages between the conservation of the country's tropical forests, biodiversity and development, so that it can structure a realistic results framework to support future programming. Notably, the analysis highlights opportunities to integrate tropical forest and biodiversity conservation into priority development sectors identified in the CDCS.

1 INTRODUCTION

1.1 Purpose

The U.S. Agency for International Development (USAID) in Mexico is currently developing a new Country Development Cooperation Strategy (CDCS) for fiscal years (FY) 2020-2025. As per sections 118 and 119 of the Foreign Assistance Act (FAA) of 1961, as amended, USAID/Mexico is required to prepare an analysis of tropical forests and biodiversity in Mexico.

The analysis will inform USAID/Mexico in developing its CDCS for 2020-2025 and will focus on two key points for both tropical forests and biodiversity:

- Actions necessary in Mexico to achieve conservation and sustainable management of tropical forests, as well as the conservation of biological diversity; and
- The extent to which the actions proposed for Agency support meet the needs thus identified.

Biodiversity conservation is critical to achieving sustainable development and should be considered in USAID/Mexico's strategic approaches to improve development outcomes. The analysis is therefore an opportunity for the Mission to better understand the strategic linkages between the conservation of the country's tropical forests and biodiversity and development, so that it can structure a feasible results framework to support future programming.

Notably, the analysis will identify strategic linkages at the results framework level, highlighting opportunities to integrate tropical forest and biodiversity conservation into priority development sectors identified in the CDCS.

1.2 Brief Description of the USAID Program

The goal of USAID/Mexico's latest CDCS[2] (2014-2018) is to support "Mexican efforts to address key challenges to improve citizen security, justice, and environmental sustainability with program approaches specifically tailored to the unique U.S.-Mexico relationship." USAID programs pursue the following four Development Objectives (DO):

DO1. To have local stakeholders replicate crime and violence prevention models;
DO2. To ensure that the 2008 Constitutional criminal justice reforms are operational;
DO3. To improve the environment to protect human rights and prevent abuses; and
DO4. To reduce greenhouse gas emissions in targeted key sectors.

Several guiding principles have been emphasized in USAID's work during the current Strategy period. First, by catalyzing, leveraging, and complementing public- and private-sector resources and capabilities, USAID has made a lasting impact that goes beyond its investments. Second, to ensure that there is substantial local ownership of USAID-

[22] USAID. (2014) Country Development Cooperation Strategy FY 2014 – FY 2018

financed initiatives, USAID has supported local champions and advocates of Mexican solutions to the country's challenges. Third, USAID/Mexico has used its relatively limited resources to identify, develop, and assess demonstration models with the end goal of promoting replication of proven approaches and models by Mexican entities and funding sources. Lastly, USAID has collaborated closely with a broad range of Government of Mexico (GOM) and U.S. Government (USG) interagency actors to maximize the impact of its programs on bilateral policy-level priorities and to coordinate related activities.

1.3 Methodology

Various methodological strategies were used to find relevant and pertinent information for each level of analysis. The strategies used are detailed below.

Desk Review. Team members jointly reviewed and discussed USAID/Mexico documents relevant to the Scope of Work (SOW) and held an initial meeting with the Mission Program and Environment Offices to understand USAID/Mexico interests with respect to the new CDCS. Prior to beginning fieldwork, the team gathered and analyzed existing data to identify tropical forest and biodiversity status, key biodiversity issues, stakeholders, policy and institutional frameworks, and gaps in the available information. The team prepared for field visits by drafting an outline for reporting, interviewing guidelines and a list of key stakeholders to be consulted (See Annex 1: Scope of Work).

Interviews and site visits. The team interviewed 85 stakeholders from 56 different institutions. Through interviews and meetings, the team identified, reviewed and analyzed new information that was not identified at the desk review and contextualized existing data. Interviews helped identify potential linkages/opportunities for integrating conservation of tropical forests and biodiversity with key sectors and/or thematic areas under the current CDCS.

Field visits (Annex 5) were conducted in the Yucatan Peninsula (Campeche and Quintana Roo), Jalisco and Sonora. Criteria for site selection were:

- The areas may have potential links with the current CDCS Development Objectives.
- The areas host a variety of projects and initiatives that exemplify efforts to scale up biodiversity and forest conservation and sustainable use, including examples of a landscape approach that facilitates scaling up and replicating successful initiatives.
- Presence of the political will for biodiversity and forest conservation.
- At least one site from each of the three regions (North, Center, South).
- Sites that have been less documented.

Threat Analysis. The threats to Mexico's biodiversity and tropical forests were investigated based on the categories of main threats identified by international consensus including the United Nations latest report on Biodiversity and Ecosystem Services (IPBES 2019): (1) habitat loss and degradation; (2) over-exploitation; (3) spread of invasive species; (4) habitat pollution; and (5) climate change. The drivers, underlying causes and observed consequences are specified for each threat.

Priority areas. The team identified priority regions for biodiversity and forestry conservation. The analysis was performed in two stages.

In the first stage, sites were selected based on amount of areas with well-preserved ecosystems (i.e. under good conservation conditions) at a municipal level for the country, as well as their level of qualitative fragmentation.[3] A differentiation was made between North, Center and South considering that there are significant differences in the magnitude of well-preserved ecosystems in each region and the level of fragmentation found (e.g. the Center and South Regions are more fragmented and less-well preserved compared to the North Region).[4] Two hundred municipalities were identified as priority areas under this first analysis.

The team integrated the first analysis described in the previous paragraph, with territorial management variables that indicate a degree of organizational and governance capacities on the ground.[5] As a result, the team identified the 20 best-preserved municipalities classified in nine sites.

In a second stage, the team performed two econometric regressions[6] to evaluate the relationship between primary habitat status (conservation and reduction or loss) and the type of land uses happening on the ground, selecting productive models appropriate for conservation and restoration: forest production, Management Units for Sustainable Use of Wildlife (UMAs), traditional agriculture, agroforestry and pasture management. The objective of this second stage of analysis was to identify the areas of intervention with the greatest impact depending on the characteristics previously described. That is, the model looks for two types of conservation areas: first, the best conserved areas where productive activities are compatible with conservation outcomes; second, the most vulnerable areas where greater loss of primary habitats is found, but that show importance in terms of biodiversity and represent an opportunity for recovery in order to preserve the country's biodiversity.

Recommended actions. The team identified a list of 39 priority actions considering the review of the literature, interviews, analysis of threats and gaps. This list of 39 actions was ranked (Table 14) using a qualitative scoring system based on the following criteria:

- How significantly the recommended action addressed the identified threats;
- How significantly it addressed the identified gaps; and

[3] For environmental criteria, the team used ecosystem integrity, biological corridors for biodiversity conservation, and the use of soil and vegetation classified by their dynamics of land-use change. The team included the loss of primary habitats, maintenance of primary vegetation cover and gains in vegetation cover.

[4] For municipalities in the North Region, at least 80% of the area of a municipality should have ecosystems in good health. For the Central region the percentage was at least 30% and for the Southeast region it was at least 40%.

[5] The team used Management Units for Sustainable Use of Wildlife (UMAs), priority areas identified by relevant previous analysis such as the Productive Sustainable Territories Project (TPS), areas under forest management and Areas Voluntarily Designated for Conservation (ADVC). See Annex 5: Table 6.2.

[6] The team performed two regressions: one where reduced primary habitat loss was the dependent variable, and another where the conservation of the current primary habitats was the dependent variable. In both cases the independent variables were the land uses in the municipalities included in the selected sites.

- How feasible it is in terms of political will, existing technical capacities and economic cost of implementation.

The lowest value given to a recommended action was seven and the highest 38. The team selected the top 30 percent. See also Annex 5.

After prioritizing, the team clustered actions into 10 key recommendations, since four actions were included as part of a more significant or comprehensive recommendation. Described in Section 10.1, the 10 key recommendations fall into four categories: a) Development of markets and market-oriented mechanisms, b) Governance, c) Planning and management, c) Boosting private sector participation in conservation and sustainable use, and d) Command and control. For each recommendation the team provided information on their impact on biodiversity and forests, a detailed description of the actions, potential stakeholders to engage, and location for implementation. The team also noted other related recommendations that may work in conjunction.

Finally, in Table 18, the 10 key recommendations were cross-checked with the USAID/Mexico Environment Program Potential Strategic Approaches that are the basis for the 2020-2024 CDCS. Opportunities to strengthen the collaboration between Development Objective 4 and other DO to contribute to biodiversity and forest conservation are shown in Table 16.

2 COUNTRY CONTEXT

Twelve countries comprise 10 percent of global land surface and are home to almost 70 percent of the planet's species. They are Brazil, Colombia, China, Mexico, Ecuador, Indonesia, Madagascar, Peru, Australia, Democratic Republic of Congo, Papua New Guinea, and Venezuela, and are described as "megadiverse". In its almost two million square kilometers, Mexico contains only 1.5 percent of the world's terrestrial and insular surface but hosts 10 percent of all biological diversity. Mexico has documented 564 species of mammals (30% endemic); 1,240 species of reptiles and amphibians (50% and 64% endemic, respectively); 2,695 species of fish (10% endemic) and 1,150 species of birds (20% endemic)[7] (Jimenez Sierra, et al 2014).

Mexico also has enormous cultural diversity that is closely connected to biodiversity use and conservation (e.g., 291 living languages or languages in use). It is also the main center of plant species domestication in Mesoamerica, with almost 120 species of domesticated plants. The evolutionary processes of domestication are gradual and continuous, and indigenous populations have played a crucial role in the selection and management of species for adaptation into local conditions and human use.

About 15 percent of the food species consumed in the world today are native to Mexico, including: corn, beans, squash, some varieties of chili, avocado, guava, jicama, tomato, tejocote, prickly pear and cocoa. A variety of plants with other uses such as cotton, tobacco, timber and medicinal species are also native to this region. Except for the dog and the turkey, most of the animals native to Mexico have not been domesticated, but are

[7] Organisms that are native or restricted to a certain place.

an important food source for local populations, whose diet is complemented by hunting fish, mammals, birds and reptiles, as well as a great variety of insects, such as escamoles, maguey worms, grasshoppers and jumiles, among others (Jiménez et al 2014).

Mexico is also particularly rich in terrestrial, coastal and marine ecosystems. Challenger and Soberón (2008) include seven classes: tropical evergreen forests, tropical deciduous forests, mesophilic mountain forests, temperate coniferous and broadleaf forests, xerophilous scrublands, grasslands and wetlands. Under this classification, xerophilous scrublands are the largest plant communities in Mexico, and mesophilic forests and wetlands are the least common.

With respect to oceanic biodiversity, Mexico has six marine provinces, which include 24 ecoregions. Knowledge of marine biodiversity is quite poor, with the exception of species of commercial interest, although Mexico has the twelfth largest sea surface, a huge ecosystem and a wealth of species. While the biological groups in the Gulf of Mexico, the Caribbean, and the Pacific have been documented and integrated into comprehensive compilations of information, each new study reveals the presence of new species or species not previously registered in Mexican waters.

2.1 National Physical and Geographical Context

Mexico is located between the extreme coordinates of parallel 14° 32’ 27” at the mouth of Suchiate River and parallel 32° 43’ 06” at the confluence of the Gila and Colorado Rivers, and West longitudes 118° 22´00” and 86° 42´36”, respectively. The country’s official land area is 1,953,162 square kilometers (km^2), plus 5,127 km^2 of insular territory, 11,122 kilometers of coastline, and 3.1 million km^2 of Exclusive Economic Zone. Thus, Mexico has a total area of more than five million square kilometers (INEGI, 2003).

Mexico borders the United States of America to the north, and the Republic of Guatemala and Belize to the south, with a border 1,149 kilometers. Mexico borders the Atlantic Ocean, the Gulf of Mexico and the Antillean Sea on the east. On the West, it borders the Pacific Ocean and the Gulf of California.

Mexico’s topographic and climatic variability is the result of its geologic history, which in turn determines its rich biodiversity. The deserts and dry climates of the North contrast with tropical forests and humid climates to the south of the Tropic of Cancer. Its physiology is characterized by diverse topography, with wide mountain ranges, volcanic chains and plateaus.

Major features include the Sierra Madre Occidental, which parallels the Pacific coast; the Sierra Madre Oriental, which runs south parallel to the Gulf of Mexico to the Sierra Mixteca; and the Eje Neovolcánico Transversal, where the highest volcanoes are found. This physiologic division defines regions with common biodiversity characteristics: deserts, native grasslands, and temperate and tropical forests, as well as farms and ranches created by clearing native grasslands and forests.

The most humid watersheds are located in Veracruz, Tabasco, Oaxaca and Chiapas. The driest watersheds are located in Baja California Sur and Coahuila. The rivers with the greatest flows are the Usumacinta, Papaloapan, Grijalva, Coatzacoalcos, Balsas, Bravo, Pánuco, Hondo, Lerma-Santiago, Tecolutla and Fuerte (Moreno, 2005).

Edaphic wealth in Mexico comprises 25 units of soil of the 32 that exist worldwide. The multiple combinations of physical factors in the national territory explain this. Six soil types (Leptosoles, Regosoles, Feozems, Calcisoles, Luvisoles y Vertisoles) cover 81.7 percent of the territory and 19 minority soil units cover the remainder (SEMARNAT, 2016).

All these factors have created conditions for a wide variety of ecosystems. Plant communities can be found in varied ecosystems: humid tropical forests, sub-humid and dry forests, temperate and mesophyll mountain forests, even xerophilous scrubs, grasslands, mangroves and other types of wetlands (Rzedowski, 2006). Many areas of the nation have not yet been studied in detail, including tropical and marine ecosystems, and particularly the deep sea (SEMARNAT, 2016).

2.2 National Socio-Economic Context

Mexico is the second most populous country in Latin America and ranks eleventh globally. By 2010, almost one-quarter of Mexicans (23.19%) lived in more than 195,000 scattered rural localities with less than 2,500 inhabitants. The other three-quarters lived in urban localities, relatively large rural localities (with more than 2,500 inhabitants) or in localities with mixed or transitional use (INEGI 2010).

The 2017 World Trade Statistical Review ranked Mexico as the world's 13th largest exporter and importer. Mexico's exports represented 42 percent of total Latin American exports, consolidating its position as the major exporting power in the region (World Trade Organization, 2018). The World Bank classifies Mexico as an upper-middle-income country. In 2018, Mexico's gross domestic product (GDP) was estimated at USD$1,223.81 billion; its *per capita* GDP was USD$19,630; and its rate of economic growth was 2.1 percent (OECD, 2019). Economic growth has declined throughout the last decade, and the 2019 forecast is for slightly above 1 percent.

Inflation for 2017 was reported at 6 percent, but was controlled at lower rates in general, and by 2018 it was 4.37 percent (Central Bank of Mexico, Banxico). Interest rates closed at 8 percent for 2018, and Mexico received USD$31,604.3 million of foreign direct investment that year, most of it destined for the manufacturing industry (Secretaría de Economía, 2018).

Remittances from abroad total USD$36 billion annually. The largest source of income was from exports (USD$265 billion). The travel and tourism sector contributed 17.2 percent of GDP (about USD$209 million) in 2018 (World Travel and Tourism Council (WTTC)). Agriculture, livestock, forestry, fishing and hunting contribute 3.3 percent to GDP, and showed an annual growth rate of 2.4 percent in 2018 (World Bank, 2018). Renewable and non-renewable natural resources contributed 1.2 percent of GDP. Table 1 shows each sector's contribution to the national economy (INEGI, 2018).

Table 1 Labor Force Employment by Sector

Sector	% of GDP	Labor Force Employed
Services	66%	62%
Industry	31%	23.8%
Primary	2.8%	13.6%

The occupation and employment ratio by economic sector are: commerce 19 percent, agricultural activities 12 percent; manufacturing industry 17 percent; construction 8 percent; transportation 5 percent; government 4 percent; electric industry 1 percent; other services 33 percent (Annex 5: Figure 2.1 *Economically active population that contributes to the GDP rates*). Because the contribution to GDP by population and by sector are not similar in proportion, sectoral analysis must consider both factors.

Although Mexico is an upper-middle-income country, 41.9 percent of the population lives in poverty and especially in rural areas (55.3 percent) (CONEVAL, 2018). Despite investment and development efforts, many Mexicans lack good quality basic services in education, health and housing, and many must work in the informal economy under precarious conditions[8]. Informal employment was estimated at 22.7 percent of GDP generated by 57.1 percent of occupied population working in the informal sector (INEGI, 2018)[9]. In this context, women and youth are particularly vulnerable. The preponderance of informal workers means higher social costs and loss of tax revenues for society as a whole, resources that could be invested in expanding education and training services.

Agriculture is an important sector to consider in this context, since it plays a crucial role in alleviating poverty. Although it contributes only 4 percent of GDP, it contributes to economic, social and environmental development in many ways. Agricultural products are the basis for many commercial and industrial activities. If agro-industrial production is considered, the sectoral contribution to Mexico's GDP exceeds 9 percent, (FAO, 2019). The rural population is increasingly diversifying its economic activities by incorporating local trade, handcrafts, material extraction, ecotourism, environmental services and wage labor in various occupations, among other means. However, agriculture continues to predominate in the Mexican countryside, especially among the poorest population, where it represents 42 percent of family income (FAO, 2019).

Moreover, agricultural activity of small producers with fewer than three hectares of land is strongly linked to biodiversity management and conservation in Mexico. An iconic example is the *Milpa* system, a thousand-year-old activity that is based in rotational intercropping of corn, squash, chili, and other agricultural products. This system allows genetic diversification by the selection of seeds of the best phenotypes adapted to local conditions and the conservation of endemic species. Unfortunately, when traditional milpa practices are replaced with monoculture or when the cycles for recuperation of soil are shortened in the milpa system, these productive practices lead to erosion, soil loss, productivity decline and the advance of the agricultural frontier. Thus, work with these small farmers is strategic for the recovery and conservation of genetic biodiversity.

2.3 National Framework for Biodiversity and Tropical Forest Conservation

This section discusses the policies, laws, programs and governmental institutions that affect the sustainable management and conservation of biodiversity and forests. It

[8] Organization for Economic Cooperation and Development (OECD, 2017), Skills Strategy Diagnostic Report, OECD Publishing.
[9] https://www.inegi.org.mx/contenidos/saladeprensa/boletines/2018/StmaCntaNal/MEI2017.pdf

analyzes the effectiveness of instruments regarding information and knowledge, policy and economic instruments, and explains the type of stakeholders involved.

In Mexico, the national framework for biodiversity and forests is composed of data and knowledge, policies, actions and stakeholders necessary for conservation and sustainable use. These elements are in many cases used in combination. The right mix depends on factors, including the degree of risk for priority species and ecosystems, the familiarity of the target group with biodiversity and forest issues, institutional development and, importantly, law enforcement capability, budget availability, market potential and price/income elasticity of resources and products, among others.

2.3.1 Policy Instruments

Information and Knowledge

Mexico has made significant progress in environmental and natural resource policy making and institution building as a result of a consistent trajectory building knowledge and data in these areas. Over the past 30 years, a variety of initiatives have collected, monitored and reported information regarding the status of and pressures on biodiversity and forests. The Ministry of Environment and Natural Resources (SEMARNAT) manages the National System of Environmental and Natural Resources Information (SNIARN). The National Commission for Knowledge and Use of Biodiversity (CONABIO) compiles satellite imaging data, electronic cartography and data on species. The National Forest Commission (CONAFOR) is responsible for forest and soil inventories, as well as the National Forest System.

Command and Control

Command and control instruments for biodiversity and forests in Mexico include a complex array of laws, treaties, regulations and standards that provide general guidelines and principles, as well as specific mandates for conservation and management. Articles 4 and 27 of the Mexican Constitution establish the right of all people to a healthy environment and the State´s right and obligation to regulate natural resources. Within this framework, Mexico has enacted more than 20 federal laws and subscribed to about 15 international treaties directly related to or with relevant provisions for the conservation and sustainable use of forests and biodiversity. In addition, there are approximately 30 Official Mexican Standards (NOMs) regulating biodiversity and forest product processes (CONABIO, 2014), and many subnational governments have enacted their own environmental and natural resource regulations.

Conservation

The protected land area in Mexico has increased eight-fold in the past two decades, reaching 90.8 million hectares (mh) in 182 Natural Protected Areas (NPAs). Of this area, 21.4mh are terrestrial (10.9% of the nation's territory) and 69.4 mh are marine (22.1% of the nation's marine surface) (SEMARNAT, 6 Informe de Labores, June, 2018). While this progress has enabled Mexico to meet its Aichi target for marine conservation, it has not been sufficient to meet the terrestrial conservation target. Also, over 50 percent of the protected areas have insufficient personnel and equipment for basic operations in 2006 (OECD, 2013) and NPAs need to improve their effectiveness and ecosystems representation. Further analysis will be explained in section 5.7.

Planning and Governance

The past three national development plans have included goals and, in some cases, specific targets for biodiversity and forest conservation. More concrete targets and indicators are incorporated in sectoral and special programs. In recent years, some non-environmental sectoral programs have included goals and actions related to biodiversity and forest conservation (Annex 12). Currently, there are at least 10 medium- and long-term national strategies that support forest and biodiversity conservation. These strategies have the advantage of setting quantitative targets for periods beyond a single government administration, but they usually lack enforcement and continuity mechanisms. Outside protected areas, ecological land use plans (ELUPs) and biological corridors are essential additional efforts for ecosystem conservation and sustainable use.

Governance structures are very important for the effective operation of policy instruments. They take the form of committees, councils, commissions, advisory boards, working groups and other operations structures with planning, oversight, follow-up and evaluation mandates. In some cases, they are established by law and in other cases they are *ad hoc* or more informal. They usually include government representatives and stakeholders from interested sectors. Some examples of governance structures relevant for biodiversity and forest policies are the Interministerial Commission on Climate Change (CICC), the Climate Change System, the Advisory Committee of Natural Protected Areas, the Interministerial Commission for Sustainable Management of Coastlines and Oceans (CIMARES), the regional Water Councils, and the local *ejido*[10] and fishermen's councils.

Economic and Market Instruments

Mexico has been a pioneer in developing a variety of economic and market instruments to foster sustainable use of biodiversity and forests. Many are subsidy based because of the economic profile and capacity of landowners where forest resources and biodiversity hotspots are located. Eighty percent of forest areas in Mexico are the communal property of 8,500 *ejidos* representing about 12 million people (Reyes J.A. et al 2012; CONABIO 2019). Direct transfers to natural resource users are the main economic means for promoting forest conservation and reforestation, sustainable wildlife management and compensation to stop fishing. Mexico's Payment for Ecosystems Services (PES) is one of the largest and best known of these programs worldwide. Natural Protected Areas have also used economic instruments for their operation, including access fees.

In addition to economic instruments established in laws and other regulations, there are a number of voluntary and information initiatives useful for developing markets for green and sustainable products. Green certification has been established for several products, including coffee, honey and cocoa. About 10 percent of all Mexican coffee producers are in the certified market. Although timber certification has also increased (with almost 1.8 million hectares of forest certified, which represents 12 percent of the total forest area

[10] An *ejido* is a system of distribution and collective possession of land that was institutionalized after the Mexican Revolution in the country. It consists in granting land to population in rural areas for its exploitation and collective use. The objective was to provide farmers with work opportunities and means for improving their wellbeing.

with timber potential), illegal timber remains a major challenge for market development opportunities[11]. In 2009 the Attorney General for Environmental Protection (PROFEPA) estimated that 30 percent of the timber production (about 10 million cubic meters) came from illegal sources (CONABIO, 2017).

2.3.2 Key Stakeholders

Most of the policies, actions and budgets related to biodiversity and forest conservation in Mexico are led by the federal government. All the institutions within the environmental sector have at least some responsibility for biodiversity and forest conservation, and some are devoted exclusively to it. The government environmental sector is made up of SEMARNAT and nine support institutions with different authority for biodiversity and forest conservation (Annex 5, Table 2.1). Internal charters and regulations have been revised a number of times to clarify powers and mandates and avoid overlap. Other ministries that collaborate with the environmental sector in biodiversity and forest matters are Agriculture and Rural Development; Economy; Tourism; Wellbeing; Agrarian, Urban and Territorial Development; Defense and the Navy.

In addition to the Executive Branch, Congress and the Judicial Branch play important roles in promoting conservation and sustainable use of biodiversity and forests through rulemaking and enforcement processes. For example, in the last legislature, the Mexican Senate crafted and approved the Sustainable Forest Development Law and discussed two Biodiversity Law Initiatives. It also modified the legal status of wildlife trafficking to serious crime. The judicial branch has recently created a specialized area for environmental and natural resource cases and has trained some of its officials on environmental matters. However, there is tremendous room for improvement and capacity building in this branch of government.

Within Congress, the environment, climate change, water and agriculture committees' study and draft legislation on biodiversity and forest issues. In the last legislature, the Mexican Senate drafted and approved the Sustainable Forest Development Law and discussed two Biodiversity Law Initiatives. It also changed the legal status of wildlife trafficking to a serious crime.

At the subnational level, most states and a number of municipalities have enacted their own environmental laws and other instruments for biodiversity and forest conservation. Examples include state and local natural protected areas, land use plans, local environmental impact assessment procedures and forest regulations. State and local governments usually lack the funds and technical capabilities for operating and overseeing these instruments.

Non-Governmental Organizations (NGOs) in Mexico have been very active in most areas of biodiversity and forest policy, from research to capacity building, resource mobilization, increasing awareness, legal compliance and activism. This includes branches of international NGOs, as well as national and local ones. They usually partner with government agencies for funding, project implementation and advising in councils and

[11] OECD (2013), OECD Environmental Performance Reviews: Mexico 2013, OECD Publishing.

committees. Large NGOs also tend to partner with local NGOs and communities and groups to implement projects. In general, NGOs in the forest and biodiversity field complement each other in terms of functions and areas of work, although there might be some overlap. The larger NGOs involved in biodiversity and forest issues in Mexico are: PRONATURA, the Mexican Center for Environmental Law (CEMDA), Mexican Fund for Nature Conservation, the Interdisciplinary Center for Biodiversity and Environment (CEIBA), Natural Landscapes and Sustainable Development, Beta Diversity, Naturalia, the Mexican Civil Council for Sustainable Development, the Nature Conservancy (TNC), Conservation International, the World Wildlife Fund, Rainforest Alliance and Greenpeace (Annex 5, Table 2.2).

Other key stakeholders for biodiversity and forest policy decision-making are indigenous and local communities, women and young people. Eighty percent of forest areas in Mexico are held as communal property[12] by 8,500 *ejidos* representing about 12 million people (FAO 2004). No conservation/sustainable use strategy will be effective without their engagement. By the same token, vulnerable and influence group—including women and the youth—are also fundamental in designing many policy areas and have been considered in a number of international and national processes.

Institutional arrangements for collaboration and coordination among stakeholders can be vertical (e.g. different levels of government or locations) and horizontal (different sectors, branches or mandates). They take the form of committees, councils, commissions, collaboration agreements advisory boards, working groups and other operating structures with mandates for planning, implementation, supervision, follow-up and evaluation. Sometimes they are established by law, others are *ad hoc* or more informal. Some examples of coordination arrangements relevant for biodiversity and forest policies are the CICC, the Climate Change System, the Interministerial Commission on Sustainable Rural Development (CIDRS), the Advisory Committee for Natural Protected Areas, CIMARES, the regional watershed councils and the local *ejido* and fishermen councils. A more comprehensive approach to integrate biodiversity into other sectorial policies could be facilitated by creating an interministerial body for biodiversity similar to the CICC, which has been very effective in establishing sectoral commitments and quantitative targets for emissions reduction and adaptation actions. Although CONABIO is designed as an interministerial commission, in practice it serves as a knowledge and advisory body with limited capacity for policy design and decision-making.

3 REGIONAL CONTEXT

3.1 Status of Biodiversity and Tropical Forests: North, Center, South

North Region

According to the National Institute of Statistics and Geography (INEGI), the biogeographic provinces of the North Region have an area of 111,557,014 hectares (Annex 5:

[12] There are three types of land property in Mexico: social, private and public. Social property corresponds to agrarian nuclei, divided in two regimes of land property: ejidos and communities. Private property is granted to private owners by the Nation; public property corresponds to land that is owned by the State.

Table 3.1)[13], with the largest area being the Northern Chihuahua Highlands. Forty-three percent of the North Region is desert scrub, followed in importance by coniferous forest, broadleaf forest and grasslands in about 18 percent of its territory, and dry-land forest in 5 percent of the region. Anthropic use, mainly agriculture, ranching and urban areas, occupy 18 percent of the area. The temperature factor is manifested in warm, semi-warm and temperate temperatures (Espinosa 2008). (See Figure 3.1, Annex 5)

Mexico possess three of the 37 "Wildlife Areas" in the world. These areas host 70 percent or more of its original habitat in good conditions, cover at least 10,000 km^2, and have an extremely low population density (of less than five inhabitants per km^2). The three "Wildlife Areas" are in the North Region: The Chihuahua Desert, the Baja California Desert and the Sonoran Desert. Particularly relevant is the Gulf of California, which is one of the most diverse worldwide. Known as the "Aquarium of the World", it is unique in the continent. Its high productivity is due to the currents that enable circulation of nutrients from the bottom to the surface (CONABIO[14]).

The region hosts a high diversity of species; almost half of the known species in the country are present in this region and almost 60 percent of these are endemic (except for amphibians, which represent 32 percent of the total known species in the country). The presence of birds and reptiles is particularly significant because the North hosts 80 percent and 82 percent of the country's known species, respectively. Reptiles are relevant because near 40 percent of species is under a category of risk under NOM-059[15].

Table 3.2 in Annex 5 shows an exhaustive compilation of the biological groups present in Mexico, based on data from the National Information System on Biodiversity (CONABIO 2019). Due to the large amount of data analyzed, information is organized by the status of species and categories of risk according to the NOM 059, the Convention on International Trade in Endangered Species (CITES) and the International Union for Conservation of Nature (IUCN).

Center Region

The biogeographic provinces of the Center Region have an area of 36,724,147 ha, (Annex 5: Table 3.1& Figure 3.3), with the largest area occupied by the Volcanic Axis and the Altiplano Sur Province. Most of the vegetation is pine forest. Due to its humidity, the types of climate are sub-humid and semi-arid with temperate climate. The transition zone is named *Mexicana de Montaña* (Espinosa 2008) (Annex 5: Figure 3.2).

Dry secondary forest is one of the main types of vegetation in the region (12% of total area), followed by desert scrubland (9%). Coniferous and broadleaf forests occupy 12 percent and dry forests occupy 5 percent area. However, 43 percent is under anthropic

[13] https://www.inegi.org.mx/temas/fisiografia/
[14] CONABIO. Riqueza Natural. www.biodiversidad.gob.mx/pais/riquezanat.html.
[15] Official Mexican Standard (NOM) are mandatory instruments designed and implemented by administrative authorities which provide technical and ecological specifications for a product or process. The Norma Oficial Mexicana 059 (NOM-059) is the Mexican legal instrument that identifies species or populations at risk using a risk assessment method.

use, mainly for farming, ranching and human settlements. The West subregion has eight priority marine regions.

The Central Region also has a large number of bird species: it hosts nearly 75 percent of the species reported for Mexico. Excepting for fish, endemism is very high with near 50 percent. Reptiles are the most vulnerable group with almost half of them under some category of risk according to NOM-059 (Annex 5: Table 3.2) (Espinosa 2008; CONABIO 2019; Llorente-Bousquets, J. y S. Ocegueda. 2008).

South Region

The biogeographic provinces in the South Region have an area of 45,601,904 ha (Annex 5: Table 3.1 & Figure 3.2). The provinces with the largest surface are the Gulf of Mexico, the Petén and the Pacific Coast. Moisture factors indicate humid and sub-humid climates, with warm and very warm temperatures. The Region has the highest amount of rainfall countrywide; therefore, the dominant vegetation are high evergreen forests. Secondary vegetation consists of dry forests (12% of the territory) and desert scrubland (9%). Primary vegetation is coniferous and broadleaf forests (12%) and dry forests (5%). However, the main land use is anthropic for agriculture, ranching and human settlements (43%) (CONABIO 2019).

Several marine priority regions are found such as the Pantanos de Centla-Laguna de Términos, which represents Mexico's most important water supply and is an area of refuge, feeding and breeding for endemic species of fish, turtles, birds, crustaceans, mammals and invertebrates. Also, the second largest coral reef in the world is located in the South Region: the Mesoamerican Coral Reef. This reef runs from Yucatan and Quintana Roo in Mexico to Honduras with an length of near 1,000 km and hosts enormous biodiversity (350 species of mollusks, 60 species of corals and 500 species of fish) (CONABIO[16]).

This region is the most important in biodiversity richness with more than 50 percent of the species described for Mexico. Eighty percent of birds, reptiles and amphibians are found in the South Region. Endemism is high in the case of reptiles, and for amphibians it is almost 100 percent. Almost half of reptile species are under risk according to NOM-059 (Annex 5: Table 3.1) (Llorente-Bousquets, J. y S. Ocegueda. 2008; CONABIO 2012; Navarro-Sigüenza et al 2014).

3.2 Cross-Cutting Characteristics

Status of Diversity

Ecosystem Diversity: Index for Ecological Integrity Equihua (M. et al. 2016 and 2004). Ecosystem integrity is an indicator for measuring the health of ecosystems as compared to natural or pristine conditions, i.e. without any human intervention. Ecosystem integrity is a useful tool to promote more prudent biodiversity management and conservation (CONABIO, 2019). Growing evidence suggests that the ecosystems' condition (i.e. their degree of integrity) is directly related to their capacity to produce goods and services available to human societies (CONABIO, 2019). In other words, healthy ecosystems are

[16] CONABIO. Riqueza Natural. www.biodiversidad.gob.mx/pais/riquezanat.html.

able to produce services such as temperature regulation, erosion control, carbon storage, recharge of aquifers, pollinators, among many others.

Compared with the Center and South, the North Region has the largest area (82%) with ecosystems in healthy conditions; they have good structure and host high biodiversity: the ecosystem integrity index ranks as high to very high. In contrast, the Center Region has the smallest surface area in that category (45%), and the South Region has 53 percent of its surface with high to very high ecosystem integrity (Annex 14 Map 2: Ecosystem Integrity Map).

The percentage of ecosystem that require immediate attention vary according to the region and is explained by the extent to which primary and secondary ecosystems are preserved. For example, the North Region has only 18 percent under anthropic use; while the Center Region reports 43.4 percent of the surface under human use, and only a few areas remain with primary or secondary ecosystems (slightly over 28% are primary ecosystems). The South Region has over 40 percent of the area occupied by anthropic use but still shows a high percentage of healthy ecosystems (53%, with an integrity index value of high to very high).

In the Center Region, actions are clearly needed to enhance biodiversity and ecosystem services that improve incomes for communities. This is a significant challenge because the region is located mainly along the Neovolcanic Axis, a heavily populated area with intense agricultural and industrial activity. In the South Region, implementing actions to restore ecosystems is a priority, particularly in Veracruz, Tabasco and Chiapas. The North Region should not be neglected, and actions should be taken to maintain its condition of high integrity index values.

Genetic diversity

As has been stated, Mexico is center of origin and domestication of crops, many of them with global relevance. It is outstanding that a significant part of the species that were important to prehispanic cultures, still remain indispensable today. Currently, domesticated species in Mexico provide half of the food that is consumed in the country. This provides a competitive and unique advantage to Mexico based in its genetic diversity (CONABIO 2008).

Native species cultivated in Mexico and their wild relatives must have a strategy based not only in strict conservation, such as the strategy used in NPAs, but also *ad hoc* strategies linked to traditional and technified practices should be combined with conservation policies outside their native habitats (CONABIO 2008).

Crops—such as maize, beans, agave, coffee, honey, chicle, cacao, and the milpa—and forestry systems are particularly relevant for diversity conservation owing to their economic and social importance and relationship to native habitats and/or because Mexico and the Mesoamerican region are the center of origin.[17]

[17] The 14 crops discussed in Annex 13 use a management system that enables conservation of native vegetation areas and maintenance and restoration practices. Obtaining benefits from areas in good

3.3 Key Changes and Updates from the Previous FAA 118/119

Land Use Change Over 2005-2016 Period

As will be explained in section 4, *Threats to Biodiversity and Forests in Mexico*, land use change, in other words deforestation and habitat loss, represent the major driver for biodiversity loss. It is of outmost importance to track land use change over time and design efficient strategies to stop deforestation.

INEGI Series III was used to characterize the main ecosystems for the previous FAA 2013 study. For the current Analysis, the team compared land use and vegetation classes by grouping the following classes for each of the series: primary vegetation, secondary vegetation, and land use of anthropic activities that include agriculture and human settlements, such as the surface area of towns and cities. Using this information, the team obtained the surface differences between the cluster classes and calculated the change rate at the beginning of each year for Series III (2005) and Series VI (2016) cartography. Table 3.3, Figures 3.4, 3.5 and 3.6 in Annex 5 as well as Map 4 in Annex 14 show detail of the main changes in use of soil and vegetation by Region.

Vegetation losses and gains for each region for the period 2005-2016 are as follows:

Table 2 Threats to Biodiversity and Forests in Mexico

Region	Losses	Gains	Unchanged
North	4%	2%	96%
Center	7%	5%	88%
South	10%	5%	85%

Self-elaboration based on INEGI, SERIES III – VI, expressed as a percentage of total area.

The Center and South Regions show a higher prevalence of landscape fragmentation, resulting in a high number of fragments and corridors that connect remaining smaller patches of native vegetation (Map 5: Annex 14).

Causes of Land Use Change Over 2005-2016 Period

This section provides an explanation of the regional causes of land use change over the period. It is important to say that there is no series of data for the agricultural frontier that enables comparison through time for agricultural land expansion. We will refer to relevant literature for pointing to main identified causes. Also, regarding deforestation and forest degradation, none of the causes is unique, nor does it have a linear relationship, nor does it operate independently. In Mexico, large geographic areas show common causes, but most are specific to smaller regions or territories (Geist and Lambin, 2002 in FCPF 2017).

In general, the causes are associated with unsustainable production practices and unsustainable economic growth. In areas with high marginalization, land management activities usually focus on satisfying local self-consumption activities. In urban areas, urban growth exercise pressures for the expansion of the agricultural frontier into new

condition is an incentive to avoid introduction of intensive forms of land use that can lead to degradation or forest loss.

areas. Conservation policies such as the presence of natural protected areas (NPA) inhibit land conversion (Figueroa and Sánchez-Cordero 2008 in Mendoza-Ponce, et al 2019). However, national protected areas have not been sufficient to preserve the remnants of forests, and ecosystems, such as tropical dry forest or scrubland, are under-represented in the natural protected areas.

South Region. Regionally speaking, deforestation is explained mainly by the expansion of extensive cattle ranching and, secondly, by the transformation of forest into agricultural areas. According to FCPF (2017), cattle ranching expansion is explained by a combination of factors including meat prices, climatic events such as droughts, cattle smuggling in the south border, and even the presence of organized crime (which lead to a reduction of herds grazing in forested areas).

In the Yucatan Peninsula, a particularly important dynamic is the presence of Mennonite communities that have converted large forest areas into mechanized agricultural plots for grain production (FCPF 2017) to supply the poultry and porcine industry in the Peninsula. Also, traditional agriculture is presenting a tendency to become sedentary which generates a permanent change in forest cover (Ellis 2015 in FCPF 2017). Urbanization is an important engine of deforestation in the Peninsula; it is related to a growing tourism sector in the region. Urban growth in areas such as Cancun and Mérida lead to the opening of roads and the establishment of urban centers, and the consequent loss of original habitat (Calmé, et al., 2011; Ellis, et al, 2015 in FCPF 2017). In other states such as Chiapas, the transformation to urban areas exists, however it is very small compared to the other activities (FCPF 2017). Poorer states such as Guerrero, Oaxaca and Chiapas are expected to increase their population, but without any associated economic growth which means an increased pressure on ecosystems and probable future deforestation rates (Mendoza-Ponce, et al 2019).

Center Region. The Center is a region with high accessibility to forests and high population densities; access to forested areas along roads is among the most significant factors contributing to deforestation: a reduction of transport costs and increased market access favor land conversion to agriculture and other uses (Mendoza-Ponce, et al 2019). In States such as Jalisco, for example, extensive cattle farming and over-grazing are one of the main causes of forest degradation (FCPF). Also, in Jalisco and Michoacan conversion to agricultural land is explained by the profitability of high value crops such as avocado[18] or agave, displacing pastures and crops to new forested or degraded areas. Jalisco is also subject to land use change due to urban and tourism growth, particularly

[18] The area of avocado plantations increased in the region from 334 ha in 2002 to more than 1200 ha in 2007. IRE. According to an article from Forbes, the global demand of avocado in 2017 increased significantly (e.g. 284% only in Holland), and in the last 11 years at least 1,217 illegal crops were detected with an associated deforestation of 88,000 hectares nationwide, according to PROFEPA. https://www.forbes.com.mx/fotogaleria-deforestacion-e-ilegalidad-el-sabor-del-aguacate/

in the coast (e.g. Puerto Vallarta) (IRE). Also, illegal logging represents a challenge for emblematic ecosystems, for example, the Monarch Butterfly Sanctuary.[19]

North Region. The relative lower deforestation rates in the North Region are explained by some authors by the engagement in other industries such as textiles rather than agriculture as a result of commercial dynamics fostered by the North American Free Trade Agreement (NAFTA). On the other hand, in municipalities with higher levels of GDP, while agricultural expansion has reduced, human settlements and urban areas have expanded (Mendoza-Ponce, et al 2019). In Chihuahua, a state that possess significant forests and biodiversity in the North Region, the expansion of livestock and agriculture are the main causes of deforestation and forest degradation, followed by forest fires and pests derived from poor control and management practices. Technical, community organization and productive capabilities are also necessary (Alianza México REDD+ n.d.).

4 THREATS TO BIODIVERSITY AND FORESTS IN MEXICO, INCLUDING CLIMATE CHANGE

As stated at the methodology section, the five categories of threats addressed are: (1) habitat loss and degradation; (2) pollution of habitats and nutrient loading; (3) overexploitation and unsustainable use; (4) introduction and spread of invasive species; and (5) climate change, which were taken from the latest report of Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES 2019) and are consistent with CONABIO's assessment (2009).

Human action and unsustainable use that immediately degrade biodiversity pose direct threats to biodiversity. A driver is a constraint, opportunity or other important variable that positively or negatively influences direct threats. Underlying causes refer to activities that are considered basic or root causes of the observed threats and drivers.

Table 3 below summarizes the threats, drivers and underlying causes and consequences observed. A complete description of the dynamics identified for threats to biodiversity and forest conservation appears in Annex 7.

Table 3 Threats to Biodiversity and Forests in Mexico

Drivers	Underlying causes	Consequences observed
1 Habitat loss and degradation		
Agriculture expansion Cattle ranching expansion	• Institutional factors (lack of efficient measures for the control of land use change; weak coordination between institutions and sectors; inefficient	• Increased rates of extinction, particularly for endemic species. • Habitat fragmentation.

[19] https://www.wwf.org.mx/noticias/noticias_mariposa_monarca.cfm?251391/96-of-all-Deforestation-within-Mexicos-Monarch-Butterfly-Sanctuaries-Occur-in-a-Single-Community

Drivers	Underlying causes	Consequences observed
Illegal logging Fires Urban expansion	administration of collective or common-use resources; weakening of social capital; distortion of policies and programs; overregulation of forestry sector. ● Market factors (rising prices and increasing demand) ● Poverty and marginalization ● Poor production practices	● Forest degradation and absolute loss. ● Loss of biodiversity and of ecosystem services (reduced farm and ranch productivity due to factors such as soil erosion; reduced capacity for rainwater retention and aquifer recharge; reduced adaptation capacity and higher costs owing to the effects of climate change). ● Deforestation and soil erosion lead to sedimentation of water bodies, increasing pollution and eutrophication, as well as silting.
2 Pollution of habitants and nutrient loading		
Unsustainable tourism and infrastructure Agriculture and ranching Untreated wastewater	● Noncompliance with the National Water Law mandate to treat wastewater before disposal. ● Lack of oversight capability. ● Public programs and subsidies that incentivize fertilizer use. ● Lack of technical assistance for efficient fertilizer use. ● Lack of knowledge about and limited use of alternative practices.	● Aquatic habitat eutrophication and degradation. ● Affected soil health, decreased fertility and reduced capacity of soils to be a carbon sink. ● Water and soil contamination. ● Harm to human health and biodiversity. ● Poor irrigation practices lead to salinization of soils and contamination by agro-chemicals.
3 Overexploitation and unsustainable use		
Overfishing and unsustainable practices Massive hunting and gathering of species with food and economic importance Illegal trafficking of species Illegal logging	● Lack of knowledge regarding species populations. ● Natural capital is undervalued as a financial and economic asset, as well as for enhancing livelihoods. ● Poverty and marginalization. ● Lack of law enforcement and limited surveillance capacity. ● Market demand, especially for highly valued species. ● Hunting of wildlife. As natural habitats are reduced and more fragmented, predators are a threat to ranchers. ● More models for sustainable use are needed to allow landowners to derive economic benefit from sustainable use (e.g. UMAs)	● Elimination of natural populations, “empty forest syndrome.” ● Additional costs for communities that need to pay for extraction in other landowners’ properties. ● Alteration of species’ life cycles. ● Soil and water degradation. Declining soil fertility due to poor practices, diminished ecosystems’ capacity to provide food. ● Over-withdrawal of aquifers, coupled with water scarcity from climate change, exacerbates stress on ecosystems.
4 Introduction and spread of invasive species		
Greater influx of people and goods by land and sea due to	● Regulation of movement and exchanges does not mitigate introduced invasive species,	● Impaired biodiversity, health and economic benefits.

Drivers	Underlying causes	Consequences observed
international and national trade, Transportation and tourism facilitate movement of domestic and wild species. Climate change.	because they are insufficient or inadequate and enforcement of existing laws is weak. ● Lack of knowledge of the consequences of invasive species.	● Physical and chemical alteration of soils, introduction of seeds and diseases, and imbalance in trophic chains where communities and ecosystems are dramatically affected. ● Increased vulnerability to the effects of invasive species, which can become plagues in new environments. ● Extinction of species, particularly on islands. ● Major economic losses associated with the introduction of invasive species.
5 Climate change		
Both a threat to biodiversity and forest conservation and a result of ecosystem loss and degradation.		● Mexico is subject to severe droughts that will intensify with climate change. ● In the absence of adaptation and mitigation strategies, high sensitivity to water erosion and loss of soil quality, seen as a rapid decline in organic matter content and soil loss.20 ● Floods and impacts of hurricanes, especially in the absence of well-preserved coastal ecosystems. ● Heavily compromised food security in rain fed areas, with negative impacts on poverty rates. ● Opening of new areas to production and/or migration to urban centers or abroad. ● New or increased presence of pests and diseases ● The National Atlas of Vulnerability to Climate Change (ANVCC) indicates that the loss of species as a main challenge, with severe effects on Mexico's biodiversity.[21]

[20] Of the total 13 million hectares of arable lands on slopes very few have measures implemented to control water erosion (Turrent-Fernández *et al. 2016).*

[21] The species analyzed in this study are 157 animals: 65 birds, 46 reptiles, 28 mammals, amphibians and one insect. Also included are 49 plants, including 3 conifers, 4 ferns, and others. The analysis shows the change to non-analogous conditions of the potential distribution of species nationwide; and were classified according to the following ranges: Low 0-25%, Average 25-50%, High 50-75% and Very high 75-100%. High values in the ANVCC allow the identification of Natural Protected Areas (NPA-ANP) with a greater

5 POLICY INSTRUMENTS: MEXICO'S PRIORITY PROGRAMS TO PROTECT BIODIVERSITY AND TROPICAL FORESTS

This section includes a brief description of the country's protected area system which is comprised of the different categories of Natural Protected Areas (NPA), as well as the management of critical biodiversity outside of protected areas, including biological corridors, wetlands of international importance, ecological land use plans, watersheds, and sea turtle nesting beaches. The team also detail the type of policy instruments available. Instruments include Policies, Laws and Regulations, Planning Instruments as well as Economic and Market Instruments. The team include a Gap Analysis for the before mentioned instruments and an analysis of Productive models compatible with biodiversity and forest conservation.

5.1 Management of Protected Areas

NPAs have been an important tool for biodiversity and forest conservation. They are home to many flora and fauna species in oceans, islands, coral reefs, mountains, valleys, forests, prairies, deserts, rivers and lakes. Most vegetation groups are represented in NPAs, conserving different biological communities. The size of NPAs plays a key role in the wellbeing and resilience of species living within them: 58 percent of the protected surface area corresponds to NPAs larger than 500,000 hectares, 33 percent range from 100,000 to 500,000 hectares and only 8.7 percent are smaller than 100,000 hectares (CONANP, 2018). In addition, NPAs represent an important part of hydrological regions. Of the 38 hydrological regions in the National Water Commission's inventory, 14 have at least 10 percent of their area protected (idem).

In Mexico, the history of using NPAs to achieve conservation dates back to 1917 with the establishment of the Desierto de los Leones National Park in a temperate forest of significant importance for hydrological environmental services for Mexico City. The number and extent of marine and terrestrial NPAs has been growing steadily ever since under a variety of protection mechanisms. However, the surface area protected experienced an unprecedented increase during the past federal administration, when the area decreed as protected was greater than that of the previous 95 years combined.

There are currently 90.8 million hectares (mh) in 182 NPAs across the country (Annex 5: Table 5.2; Annex 14: Map 19); 21.4 mh are terrestrial (10.9% of the national territory) and 69.4 mh are marine (22.1% of the national marine surface) (SEMARNAT, August, 2018). While this progress has enabled Mexico to meet its Aichi target for marine conservation, it is not sufficient to meet the terrestrial conservation goals. To meet the Aichi target[22],

number of species with high degrees of change expected under climate change conditions and that occupy larger areas within the NPA.

[22] The Aichi Biodiversity Targets are a set of 20 global targets under the Strategic Plan for Biodiversity 2011-2020. They are grouped under five strategic goals:

a) Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.
b) Reduce the direct pressures on biodiversity and promote sustainable use.
c) Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

214mh of land area will have to be added to the NPA System by 2020. According to some experts, NPAs are the prime instrument for biodiversity conservation in Mexico. In assessing 44 NPAs, a study found that conversion of land and vegetation to other uses is lower within NPAs than in adjacent areas in 70 percent of the cases (Figueroa F. et al, 2011). However, NPAs confront several challenges such as incomplete planning tools, decreasing budgets, insufficient personnel for operation and surveillance as well as illegal activities within their jurisdiction (e.g. Illegal logging and irregular human settlements). In 2006, over 50 percent of the federal protected areas had insufficient personnel and equipment for basic operations (OECD, 2013).[23]

NPAs are managed through a zooning criteria framework. Generally, two types of zones are specified in the decree of creation for each NPA: *nucleus* and *buffer zones*. Nucleus zones are defined as areas of strict protection with the objective of long-term preservation of ecosystems. Uses authorized within nucleus zones include conservation, research and environmental education. Buffer zones are established to regulate sustainable use activities within NPAs. There are 8 types of subzones within buffer zones (Iñiguez L. et al, 2014): preservation, traditional use, sustainable use of natural resources (uses for self-consumption), sustainable management of ecosystems (including sustainable agriculture, livestock and forestry practices), special management (low impact infrastructure), public use (recreation and ecotourism), human settlements (only if they were present before the creation of the NPA) and recovery (in highly affected areas).

While nucleus and buffer zones are specified in the NPAs creation decree, the uses allowed in each subzone are detailed in a management plan. For this reason, NPAs are required by law to draft and publish management plans for their operation. Currently, 126 NPAs have management plans drafted representing 84 million hectares and only 112 of these drafts have been published (SEMARNAT, 2018). The absence of management plans has created different problems to NPAs including the conversion of land to unsustainable economic activities and even irregular human settlements. Moreover, in some cases this conversion has been so dramatic that the territory is not eligible to operate as NPA anymore.

NPAs are classified into six types corresponding to the goals they pursue and the regulations governing activities within them.[24] Table 4 below presents the land area for

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d) Enhance the benefits to all from biodiversity and ecosystem services.
e) Enhance implementation through participatory planning, knowledge management and capacity building.

[23] In the past years, CONANP and CONABIO have introduced different methodologies to measure the effectiveness of NPAs in attaining their objectives. Section 5.8 below presents some findings from the gap analysis methodology. Other methodologies applied include scorecards, rapid effectiveness evaluation, management effectiveness tracking tool (METT), Pomeroy (CONANP, 2019). In 2017 CONANP introduced the Permanent Effectiveness Evaluation System (i-efectividad) which is based on 48 indicators organized in 5 components: planning, administration and finance, uses and benefits, governance and operative management (idem). While 101 NPAs have been evaluated with different methodologies since 2005, results are not comparable and have not been published in accessible formats. It is expected that the application of the e-efectividad system will address this problem.

[24] 1) **Biosphere reserves** are established in areas rich in biodiversity and ecosystems. All uses are possible in buffer zones, even human settlements if they were present before the creation of the NPA. **2) National**

each type, as well as its importance in relation to the national territory. Biosphere reserves account for 85 percent of the total protected area (CONANP, 2018). This is an internationally recognized scheme of protection where conservation/biodiversity goals are balanced with social and economic objectives. Because most people living in Mexican NPAs are low income and are often members of indigenous communities, finding innovative ways to compensate for their use under sustainable practices is a priority.

Table 4 Types of protected areas in Mexico

Management Scheme	Number	Total surface area (ha)	% of Total area under protection	Terrestrial and inland water surface (ha)	% of the total terrestrial and inland waters	Marine surface	% of the total marine surface
Biosphere Reserves	44	62,952,751	68.98%	9,514,128	4.84	53,438,623	16.97
National Parks	67	16,220,099	17.77%	673,801	0.34	15,546,299	4.94
National Monuments	5	16,269	0.02%	16,296	0.01	0.00	0.0
Areas for protection of Natural Resources	8	4,503,345	4.93%	4,503,345	2.29	0,00	0.0
Areas for the Protection of flora and fauna	40	6.996,864	7.67%	6,668,602	3.39	328,262.90	0.10
Sanctuaries	18	150,193	0.16%	4.628	0.0	145,565	0.05
Areas Voluntarily Designated for Conservation (ADVCs)	388	417,000	0.46%	NA	NA	NA	NA
Total	**570**	**91,256,521**	**100.01**	**21,376,177**	**10.87**	**69,458,750**	**22.06**

Source: CONANP 2018

parks are established in places ecosystems with scenic beauty, as well as historical, scientific, educational and recreational value, eligible for ecotourism activities. Nucleus zones present and restricted use and buffer zones usually have traditional, public and recovery subzones. 3**) Natural monuments** are established in areas with exceptional value due to their aesthetic, historic or scientific virtues. Extractive uses are not allowed, and buffer zones include public and conservation subzones. **4) Areas for the protection of natural resources** are designated for the protection of soil, waters, forest and other natural resources not included in other categories of protection. All types of zones and subzones are allowed according to their management plan. **5) Areas for the protection of flora and fauna** follow provisions from the wildlife and fisheries laws to conserve endanger or priority species. All type of subzones are allowed in nucleus and buffer zones. **6) Sanctuaries** are established in areas with species that have restricted distribution including glens, caves and natural water wheels ("*cenotes"*). Nuclear zones have protection and restricted use and buffer zones present public and recovery subzones (Iñiguez L. et al, 2014).

Areas Voluntarily Designated for Conservation (ADVCs)

In recent years, Areas Voluntarily Designated for Conservation (ADVCs) have become important. There are currently 388 ADVCs throughout Mexico, especially in the center and southwest, covering 417,000 hectares (Annex 14: Map 15) (CONANP 2018). In light of scarce budget resources, the current administration has indicated that ADVCs will be the only means used to increase the total protected area in Mexico. To establish an ADVC interested private or social parties (e.g. communities) donate land for that purpose and CONANP certifies the proposal. With the certificate, ADVCs are eligible for government subsidies to preserve the area such as the Payment for Ecosystem Services Program (see section 5.6 below). Experts believe that ADVCs will only expand if public resources match private ones.

5.2 Management of Key Natural Resources Outside Protected Areas

Connectivity between protected areas is essential for species mobility and for maintaining their health and genetic variability. There are a number of territorial planning, complementary conservation and sustainable use arrangements that foster connectivity between NPAs. The most important include biological corridors, wetlands of international importance (RAMSAR sites), wildlife conservation management units, areas under sustainable forest management, ecological land use plans, managed watersheds and nesting beaches for marine turtles.

Biological Corridors (Map 23: Annex 14)

Biological corridors are geographically defined areas that provide connectivity between landscapes, ecosystems and habitats, natural or modified, and ensure the maintenance of biodiversity. There are currently 21 biological corridors cartographically defined in Mexico, although policies and projects have been implemented in only some of them. A good example of this type of this corridor is the Mesoamerican Biological Corridor (CBMM).[25] The CBMM is based on an integrated model to halt the agriculture frontier, protect remnants of temperate and tropical forest and adopt solid polices to address climate change. Its goals are to build local capacities for the conservation and sustainable management of natural resources and to serve as a platform to leverage public resources for community-based biodiversity conservation (CONABIO, 2019). It has been a good example of sustainable land planning, policy coordination among different sectors and levels of government, knowledge and capacity building, synergies in resources and funding, and sustainable productive systems. It was the basis for biological corridors in other regions of Mexico and for the Productive Sustainable Territories (TPS) project

[25] Supported by Global Environmental Fund (GEF) funding, the CBMM started operation in 2001 and currently includes the states of Chiapas, Quintana Roo, Yucatán, Campeche, Tabasco and Oaxaca (CONABIO, 2016). Between 2002 and 2016 the project mobilized over 40 million dollars to finance projects from national and international sources. At least nine sustainable productive systems -coffee, honey, ecotourism, wildlife management, cocoa, silvopastoril livestock, forestry, agroforestry and handcrafts production- were sponsored in the CBMM area with benefits to over 14,000 people a year - 57% indigenous- (CONABIO, 2016).

approved by the Global Environment Fund (GEF) in 2018 but still under consideration by the current administration.[26]

Wetlands of International Importance (Map 21: Annex 14)

Mexico has been a member of the Convention on Wetlands of International Importance (RAMSAR) since 1986. Currently, 142 sites covering 8.6 million hectares are registered under the RAMSAR convention. CONANP is the focal point for the Convention and also the responsible authority for overseeing sites within NPA regime and in other locations (CONANP 2019).

Progress in effectively implementing the Convention includes the National Wetlands Inventory, establishment of the National Wetlands Committee and updating important standards for water (NMX-AA-159) and mangrove conservation (NOM 022, 2003) (RAMSAR, 2019). However, the status of Ramsar sites in Mexico is not clear because evaluations have been undertaken in only 18 sites and management plans have not been completed (idem). Of the 142 sites, only 51 have management plans. In addition, lack of resources for monitoring, management and enforcement—especially for sites outside NPAs—hampers the effectiveness of this conservation tool (idem). For example, the National Wetlands Inventory indicates there are 6,331 wetland sites in Mexico covering 5 percent of the national territory. Although not all sites are eligible to be registered by the Convention, the gap in number of sites and extension is significant.

Ecological Land Use Plans (Map 25: Annex 14)

Ecological land use plans (ELUPs) are legally defined as environmental policy instruments aimed at regulating or inducing land use and productive activities to achieve environmental protection, conservation and sustainable use of natural resources. The decreed ELUPs have increased from 12 in 2000 to 144 today, covering 52 percent of the national territory (SEMARNAT, 2019). They include areas within a state, subregions and regions for terrestrial, coastal and marine ecosystems. In 2012, a national ELUP was decreed. Since they are instruments mandated by the General Law on Ecological Balance and Environmental Protection (LEGEPA), they are subject to legal enforcement. However, they lack both predictable budgets and institutional mechanisms for implementation and evaluation.

Watershed Management

Watersheds are defined as units of territory divided by natural water boundaries. The National Water Commission (CONAGUA) has identified 731 watersheds in Mexico

[26] The TPS project will focus on promoting sustainable production landscapes, where production and conservation decisions are made jointly with producers. Program coordination at the local and regional levels and access to financial and market instruments will make this possible. The project covers an area of about 45 million hectares across seven priority regions, identified on the basis of how representative they are in terms of biodiversity, connectivity, land and forestry management activities, climate vulnerability and mitigation potential, ecosystem services, and agricultural production activities. Areas include Chihuahua-Durango, Coahuila, Jalisco, Sierra Madre Oriental, Sierra Norte de Oaxaca, Usumacinta Basin and Yucatan Peninsula. GEF funding amounts to USD$21.8 million to leverage USD$140 million of total investment from a variety of sources.

grouped in 37 hydrological regions. To manage these regions using a river basin approach, 26 watershed councils, 37 commissions and 47 committees have been established. These bodies are composed of members from the three levels of government, the private sector and civil society (CONAGUA, 2015).

The few available evaluations of watershed councils and programs focus on governance and programmatic issues and not on their potential impact on biodiversity and ecosystems. Some of the shortcomings identified include lack of representativeness of users in governing bodies, lack of democratic processes for decision-making, lack of transparency and information on decisions and processes, and uneven participation by government authorities (CONEVAL, 2012).

Sea Turtle Nesting Beaches (Annex 5: Figure 5.2)

Launched 53 years ago, the National Program for the Conservation of Sea Turtles is one of the oldest wildlife management programs in Mexico. Through conservation, enforcement, fishing technology development, education and social involvement, it has achieved the recovery of some sea turtle species. There are currently 45 nesting sites managed by CONANP, state governments and other partners, where over 34 million turtles were reproduced and released to the sea in 2018. Of the six species that visit Mexico, some nest only in the Pacific, some only in the Gulf of Mexico and the Caribbean Sea, and some in both places. There is a high concentration of nesting sites in the Yucatan Peninsula.

Table 5 Coverage of priority sites for biodiversity conservation by priority level

Type and Priority Level	Area covered by NPAs (%)		
	Before 2007	2007-2017	Stock
Important sites for marine biodiversity			
Extreme importance	26.33	45.45	71.78
High Importance	17.45	9.28	26.73
Important sites for terrestrial biodiversity			
Extreme importance	8.82	1.30	10.12
High Importance	50.88	4.50	55.38

Source: CONANP, 2018

5.3 Policies, Laws and Regulations

Command and control instruments for biodiversity and forests include a complex array of laws, treaties, regulations and standards that provide general guidelines and principles, as well as specific mandates for conservation and management. These instruments have been adopted over the past 30 years in response to domestic and international progress. Some of them are specific to forest and biodiversity issues and others regulate factors of pressure, impacts or related media. Most instruments have evolved from a resource extraction approach to conservation, sustainable use and, more recently, comprehensive instruments that reconcile competing interests.

Articles 4 and 27 of the Mexican Constitution establish the right of all people to a healthy environment and the State´s right and obligation to regulate natural resources. In this

framework, Mexico has enacted close to 20 federal laws explicitly related to or with relevant provisions on this subject (Annex 5, Table 5.3). Enacted in 1989, the General Law on Ecological Balance and Environmental Protection (LEGEEPA) sets the guiding regulatory principles and instruments for conservation and sustainable use of natural resources and ecosystems. It defines biodiversity as the variability of living organisms, of any source, including land, marine and other aquatic ecosystems, as well as the ecological complexes of which they are part.

As mentioned previously, changes to land use to expand the agricultural frontier are the greatest challenge to biodiversity and forest conservation in Mexico. In response, most agricultural legal instruments consider some environmental or sustainability principles. However, they have not been translated into practical action to address the land use change challenge. Agricultural subsidies pay more money per hectare than forest instruments, so landowners have incentives to convert forest into farm plots.

The General Law of Sustainable Forest Development (LGDFS), passed in 2018, addresses this subsidy distortion. It mandates close coordination between the Ministry of Agriculture (SADER) and CONAFOR for monitoring and policy design and forbids granting agricultural subsidies in deforested or forested land. Nonetheless, other Ministries are not bound by this restriction stated in the LGDFS. That is the case for the Ministry of Wellbeing, which is currently implementing *Sembrando Vida*, a flagship program for the current federal administration with a goal of cultivating a million hectares. It is being implemented in 19 states across Mexico where a $5,000 pesos subsidy and production inputs (plants, equipment, tools) are provided to land tenors of 2.5 hectares plots (Presidencia de la República, 2019). Impacts to biodiversity and ecosystems from this program have not been analyzed and very limited consultations have been conducted with institutions with clear relevance in the policy area such as SEMARNAT, CONAFOR and SADER, which could lead to potential inconsistencies with current laws, standards, guidelines and principles including the LGDFS.

Internationally, Mexico has subscribed to over 15 international treaties related to biodiversity and forest issues (Annex 5, Table 5.4). These instruments have evolved from protecting individual species and habitats to more comprehensively addressing biodiversity and climate change with a wide range of tools. The Convention on Biological Diversity (CBD) is the most important international instrument adopted by Mexico on this subject and includes protocols for biosafety and access and genetic resources benefit-sharing.

In the last five years other important international instruments have been adopted, including Agenda 2030 and the Sustainable Development Goals, as well as the Paris Agreement with more concrete and innovative targets and implementation mechanisms. International treaties have a second-tier hierarchy under Mexico´s legislation, below the Constitution, which implies that they are legally binding. However, translating international provisions into national actions is not always straightforward. Some agreements are subject to the principle of common but differentiated responsibilities, which allows for broad flexibility in the selection of instruments, targets, schedules, technologies, geographies and other important implementation criteria at the national level. In other cases, provisions of international accords might be clear, but the ability to implement them at the national—and especially the local—level is weak.

Official Mexican Standard (NOM) are mandatory instruments designed and implemented by administrative authorities which provide technical and ecological specifications for a product or process. There are approximately 30 NOMS related to biodiversity with technical specifications on the management of species, ecosystems, genetic diversity and biosafety (CONABIO, 2014). In addition to federal instruments, many subnational governments have enacted their own environmental and natural resources regulations.

5.4 Planning Instruments

Planning instruments comprise long and medium-term strategies as well as national development plans, sectoral programs and special programs and projects. This also includes instruments for territorial planning like ecological land use plans and biological corridors. The past three national development plans have set goals and, in some cases, specific targets for biodiversity and forest conservation. The following table provides information for the current and the past administration (See Annex 5, Table 5.5 for information since 2001). More concrete targets and indicators are incorporated in sectoral and special programs. In recent years, some sectoral programs other than the environmental have also established targets and actions related to biodiversity and forest conservation.

Table 6 Current and Past Administration Planning

Time Period /Policy	Goals
2019-2024 Social Policy	Sustainable Development: ● Consider the impact of policies and programs on the social safety net, ecology and ecological and political horizons of the country ● Foster economic growth without affecting peace, solidarity, cultural diversity and the environment Sembrando Vida: ● Subsidy to low income rural landowners in 20 states to plant fruit and timber trees in 2.5 hectares per beneficiary with the aim of affecting a total surface area of one million hectares
2013-2018 Economic (Prosperous Mexico)	Protect the Natural Patrimony: ● Conservation, restoration and management of natural capital ● Sustainable management of timber and non-timber forest products ● Consumption of environmental goods and services ● Build capacities of *ejido* and communities in forest and highly biodiverse zones ● Increase the surface area under conservation through best practices and regulation ● Streamline biodiversity conservation and sustainable management programs for the benefit of low-income communities ● Improve reforestation, tackle wildfires and restore damaged ecosystems

Including goals in national development plans raises the visibility and political will for specific issues. Since government agencies are required to periodically report progress in attaining these goals, they define quantitative targets, design programs and projects, and allocate budget resources for their implementation. The 2019-2024 National

Development Plan (PND) is vague regarding goals for the environment and natural resources sector. Sustainable development is part of the social policy agenda, but it only addresses general considerations for crosscutting effects (social and environmental) of governmental policies and economic growth, without indicating the direction of biodiversity and forest policies. The current PND also includes general specifications for the "*Sembrando Vida"* (Planting Life) program, a subsidy to low-income rural landowners to plant fruit and timber trees operated by the Ministry of Welfare.

Currently, there are at least 10 medium- and long-term national strategies that support forest and biodiversity conservation (Annex 5, Table 5.6). While these strategies have the advantage of setting quantitative targets for periods beyond a single administration, they usually lack enforcement and continuity mechanisms. Mexico´s National Biodiversity Strategy (ENBioMEX) was presented in the context of the 13th Conference of the Parties of the CBD hosted in Cancun in 2016. It is the most comprehensive planning instrument in this field, with a vision reaching to 2030. The strategy is based on six strategic axes (knowledge building, conservation and restoration, sustainable management, tackling drivers, education-communication-culture, integration and governance) and includes an implementation plan with 160 actions. It also aligns its goals and implementation mechanisms with international commitments, such as the CBD-Aichi Targets and the Sustainable Development Goals, as well as with key national planning instruments, including the National Development Plan and sectoral programs.

With a 2030 vision, the National Strategy for the Reduction of Emissions of Deforestation and Forest Degradation (ENAREDD+) adopted in 2017 provides a coordination instrument for a sustainable landscape and forest management to promote mitigation and adaptation actions as well as sustainable rural development. Through inter-institutional coordination, the ENAREDD+[27] seeks to influence public policy in order to halt deforestation and forest degradation and foster conservation, restoration and sustainable forest resources management. The strategy is organized in seven components and will be implemented in three phases: 1) design and implementation of public policies and the legal framework to foster forest resource conservation and sustainable management; 2) measurement of early Reducing Emissions from Deforestation and Forest Degradation (REDD+) actions; 3) compliance with the REDD+ compensation mechanism.

5.5 Local Efforts

Public policy in Mexico has traditionally been top-down, using a sectoral approach. Although key elements of the legal framework (such as the Law for Rural Sustainable Development) provide a comprehensive and nested governance structure and mandate for public participation at different levels, in practice local stakeholders are rarely included in decision-making with a landscape approach. Nonetheless, interesting governance initiatives now provide promising opportunities for integrating stakeholders into collaborative networks. Examples include inter-municipal associations or *juntas*, Agents

[27] REDD+ refers to the mechanism developed and established to reduce emissions from deforestation and forest degradation, as well as to foster conservation, sustainable management of forests, and enhancement of forest carbon stocks. The ENAREDD+ is the country strategy for the development and implementation of the REDD+ mechanism in Mexico.

for Rural Development in the REDD+ mechanism, and collaboration between states to promote connectivity (e.g. Biocultural Corridor of the Center-West of Mexico, COBIOCOM), as well as the sustainable landscapes experiment financed by the French Agency for Development (AFD) in Jalisco (Paisaje Biocultural, 2019).

5.6 Economic and Market Instruments

Mexico has been a pioneer in developing economic and market instruments to foster sustainable use of biodiversity and forests. Many of these instruments are subsidy based for a variety of reasons, including the economic profile and capacity of landowners where forest resources and biodiversity hotspots are located. According to the National Agrarian Registry, about 53 percent of total land surface in the country is owned by *ejidos* or indigenous communities, and many of them are impoverished (Reyes et al., 2012). The main economic instruments to promote forest conservation and reforestation, sustainable wildlife management and compensation for stopping fishing are direct transfers to natural resource users.

Payment for Ecosystem Services (PES) (Map 11, Annex 14)

Mexico's PES program is one of the largest and best known worldwide. The federal government through CONAFOR launched two PES initiatives involving forest management: The Hydrological Ecosystem Service Program in 2003 and the Program to Develop Ecosystem Service Markets for Carbon Sequestration and Biodiversity and to Establish and Improve Agro-forestry Systems in 2004. Since 2011, these programs have been merged into one with two modalities (hydrological ecosystem services and biodiversity conservation) along with an environmental endowment fund and promotion of local PES mechanisms through matching funds (OECD, 2013).

Forest Land Use Change Compensation Mechanism

Another economic instrument used in the forest sector is the Forest Land Use Change Compensation mechanism applied to infrastructure projects under federal jurisdiction. Project promoters are required by law to reforest an area equivalent to the area deforested by paying into a compensation fund managed by CONAFOR (idem). CONAFOR also manages other programs for reforestation and forest restoration by providing seedlings, training and funding. These programs have been very effective in increasing forest coverage. It is estimated that without CONAFOR´s support, the total area reforested in Mexico would be 10 percent of the current area (UACH, 2010). As demand for this support is oversubscribed, additional features should be considered to target and prioritize payments to areas that are highly beneficial and are likely to enhance provision of ecosystem services.

Management Units for Wildlife Conservation (UMAs) and the Action Programs for the Conservation of Species (PACE) (Map 20, Annex 14)

The UMAs and the PACE are two more examples of subsidy programs to foster conservation and sustainable use of biodiversity. The UMA program was launched in 2010 in rural areas to tackle poverty and foster sustainable management of species. PACE for the Vaquita has incorporated buyouts for fishermen who are willing to stop fishing or "switch-outs" for those who agree to use alternative vaquita-safe fishing methods.

Economic Instruments for Natural Protected Areas (NPAs)

NPA have also used economic instruments for their operations. Access fees were introduced in 1998. While the revenue initially went to the federal treasury, since 2001 Congress has earmarked it for activities within NPAs. Both the number of NPAs using access fees and the revenue collected have grown significantly, and this revenue is now equivalent to 7 percent of the NPAs' budget (OECD, 2013). There are also subsidy initiatives such as the Program of Conservation for Sustainable Development (PROCODES) that promote restoration and productive projects in NPAs.

Voluntary Initiatives

In addition to economic instruments established in laws and regulations, there are several voluntary and publicity initiatives useful for developing markets for biodiversity-friendly products. Green certification is a growing practice for products, including coffee, honey, cocoa, vanilla, and forest management. About 10 percent of all Mexican coffee producers are in the certified market. Certified honey production has been increasing in the last decade, fostered by growth in demand in Europe. However, quality standards for these products and certification is relatively high. Although timber certification has also increased (with almost 1.8 million ha of certified forest), illegal timber remains a major challenge for market development. Certification of ecotourism and sustainable tourism activities presents significant opportunities in a rapidly growing sector. However, capacity building and financing instruments will be needed to take advantage of these opportunities. Sections b and c bellow elaborate on the market potential, costs and benefits for biodiversity-friendly production practices.

5.7 Gap Analysis of Policy Instruments

Natural Protected Areas

In 2006, over 50 percent of the federal protected areas had insufficient personnel and equipment for basic operations (OECD, 2013). In addition, NPAs need to improve their effectiveness and ecosystems representation. Evaluations of ecosystems representation have concluded that dry tropical forest and primary grasslands are under-protected, since these ecosystems have been rapidly transformed to productive activities. Of Mexico's 96 ecoregion, 50 are under-represented, and 34 are represented in higher proportions than the percentage protected at the national level. In the 23 terrestrial ecoregions,[28] NPAs cover only 10 percent in less than half of them (CONANP, 2018) (Annex 5, Table 5.1).

There are NPAs in seven marine ecoregions in the Pacific and the Gulf of Mexico. The Sea of Cortez (Gulf of California) has the largest protected surface. Likewise, islands and coral reefs are covered by NPAs, although there is ample room to increase their protection (Annex 5, Table 5.2)

As regards priority sites identified in the 2007 gap analysis (SEMARNAT-CONABIO, 2007), up to 10 percent of the extreme priority and 55 percent of the high priority terrestrial

[28] Ecoregions or bioregions are geographic units with characteristic plants, animals and ecosystems. They are a division of larger biographic regions. CONABIO, ¿Qué es una ecorregion? https://www.biodiversidad.gob.mx/region/quees.html

sites have been protected under federal NPAs. In contrast, 53 percent of extreme priority and 43 percent of high priority marine sites have been protected as NPAs.

Table 7 Coverage of priority sites for biodiversity conservation by priority level

Type and Priority Level	Area covered by NPAs (%)		
	Before 2007	2007-2017	Stock
Important sites for marine biodiversity			
Extreme importance	26.33	45.45	71.78
High Importance	17.45	9.28	26.73
Important sites for terrestrial biodiversity			
Extreme importance	8.82	1.30	10.12
High Importance	50.88	4.50	55.38

Source: CONANP, 2018

Biodiversity and forest legal system

Mexico´s legal and regulatory framework for the environment and natural resources is comprehensive and tackles a number of priorities for effective biodiversity and forest conservation. It integrates provisions in the Constitution, national and subnational laws, international treaties, and administrative standards. It also addresses ecosystems, media and species covering a fairly wide range of the spectrum. However, there are three challenges to strengthening the system's effectiveness:

1. *New laws and standards*: The previous legislature discussed a draft General Biodiversity Law, although it was never adopted. The draft prompted some criticism from various sectors and could have been improved, but a lack of political will prevented further discussion. As with climate change, a law on biodiversity will foster certainty in the long run and provide the opportunity to establish quantitative targets. It will also address biodiversity in a comprehensive manner as opposed to the sectoral and thematic approach in which instruments are currently crafted.

At the subnational level, most states have environmental laws, and several have forest laws. However, there are opportunities for complimenting/supporting federal attributions at the state level. For example, the states of Mexico and Jalisco have requested the federal government to lead forest resources planning and monitoring responsibilities in their jurisdiction; and the Government of Sonora is responsible for the administration of Units of Wildlife Management (UMAs). As for standards (NOMS), there is also significant room for improving the existing ones and designing new ones with regard to species, media and ecosystem services.

2. *Enforcement capacities*: Human, technical and material resources for enforcing laws and regulations are not sufficient to monitor and tackle the diverse drivers of illegal deforestation and biodiversity degradation. The nation is vast and most places where illegal activities take place are remote and difficult to access. PROFEPA leads law enforcement efforts for biodiversity and forest resources. However, the number of PROFEPA inspectors has been decreasing in recent years. There are now only 605 for all matters nationwide

(OECD, 2013; Mina, 2019). Although PROFEPA shares monitoring, inspection and prosecution responsibilities with other federal authorities and state and local governments, these actors usually lack capabilities on environmental and natural resources matters. Law enforcement effectiveness and efficiency could be strengthened by enhancing horizontal and vertical coordination, building technical and technological abilities and boosting citizen and community participation (see recommendations section).

3. *The key role of the Judicial System*: Even when assuming that the components in law enforcement—from detection and investigation of crime to prosecuting a case—work effectively, if the violation of the law does not lead to an exemplary sentence, incentives to comply will be disregarded and impunity will prevail. Less than 2 percent of environmental law violation cases in Mexico end in condemnatory sentences. Between 2009 and 2014, there were over 3,000 complaints of environmental law violations of which only 183 led to preliminary inquiries and only 37 were subject to condemnatory sentences (UNOCD, 2014). Judges tend to avoid or dismiss environmental cases because they lack the technical knowledge to understand them or because they find them less important than other matters. It is imperative to enhance capacities in the Judicial System on environmental matters to enable judges to effectively resolve cases and disputes. This could be achieved by training personnel and establishing specialized areas and courts.

Economic and Market Instruments

From an economic perspective, the main threats to biodiversity arise from the lack of profitability of staples such as maize and beans; expansion of the area devoted to high-value crops such as avocado, and environmentally damaging agricultural practices. In general, monocrops require soil qualities and practices that require expanding agricultural land area, distort land markets and prevent long-term sustainability.

As discussed previously, low crop prices, extreme weather, uncertain support and lack of financial alternatives force farmers to open new land to farming or to change their production processes. Some alternative production practices with lower impact on the environment and biodiversity include: a) Agroforestry projects (coffee, cocoa, vanilla, pepper, non-timber products, chewing gum); b) Private and community forestry projects (extraction of pine-oak timber systems, extraction of tropical woods, others); c) Animal handling units – UMAs for hunting deer, native pork, peccaries and raising species such as crocodiles, macaws and others; d) Silvopastoral projects; e) Rotative traditional milpa production system; f) Ecotourism; g) Sustainable fishing; h) Mangrove management; i) Honey production.

Several productive activities show complementarity with biodiversity conservation. The team identified 10 productive activities and analyzed their feasibility for implementation considering the following economic indicators: a) main barriers to implementation; b) index for average cost-benefit analysis; and c) time for obtaining monetary income.

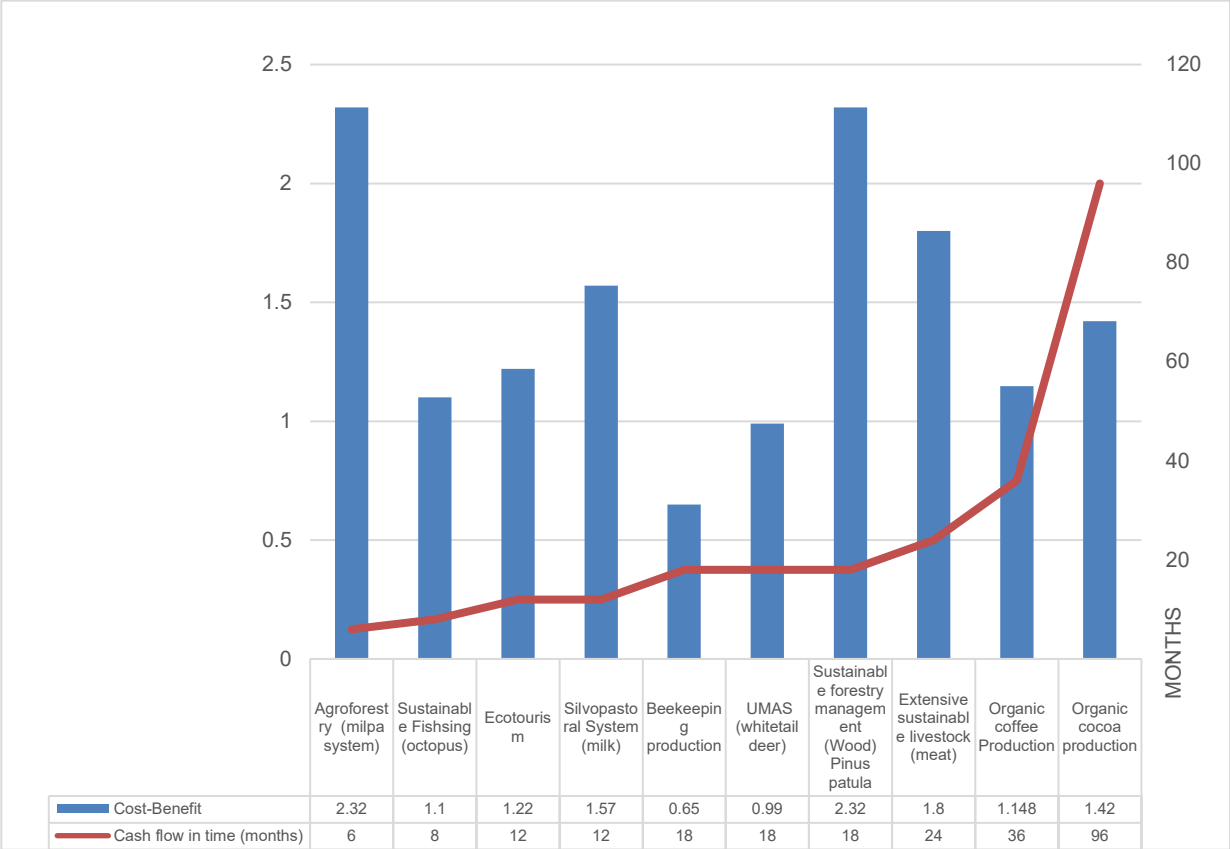
Figure1 shows the relationship between the cost/benefit of these 10 productive activities and the time required to see monetary income as a result of the activity (cashflow in time).

For example, the development of a productive activity such as milpa[29] generates income approximately in six months with a high cost/benefit rate. In this example, the cost/benefit rate is 2.32, that is, for each Mexican peso invested, the producer receives 2.32 pesos as a return of his or her investment, both as products destined to the market and for self-consumption. This production is an example of an activity of rapid return and high-profit rate but developed in small farms, by many producers who allocate most of their production to self-consumption (Olivera et al, 2013).

On the other hand, forestry also has a high cost/benefit rate of 2.32, but the first income from this activity is received 100 months (approximately eight years) after the initial investment. Forestry requires large areas of land and significantly higher invested capital compared to milpa. Another case is the honey production and beekeeping, which has a low cost/benefit rate of 0.65 but with income generation in 18 months, with small amounts of investment, and frequently supported through subsidies. In this sense, honey production and beekeeping is complementary to other productive activities, since the generation of income does not cover the investment in the medium term.

[29] Milpa is a production system based on maize in association with other crops such as squash, beans, and peppers among other possible crops. Historically, milpa has represented a source of food for rural families and a base for food security in rural areas. When developed correctly, it is a sustainable production system that enables conservation of biodiversity.

Figure 1 Key Value Chains Compatible with Biodiversity and Forest Conservation



Source: Self-elaboration

Table 5.7 in Annex 5 provides detail of productive activities (value chains), their relationship with Direct Threats for conservation of Biodiversity and Forests, cost-benefit analysis, how effective each one is in addressing threats, the main barriers to implementation, identified promoting organizations and the cash flow timeline.

This analysis focuses on the profitability of biodiversity-friendly production practices using a value chain approach. The entire farm is considered the productive unit instead of considering just one of its productive activities or sources of income. The priority is to understand the farm as an integrated multi-product system, with a view to reducing risk and uncertainty about the low profitability and volatility of agricultural products, the occurrence of extreme events, supply chain fragmentation, logistics costs and storage, among other factors.

Two considerations are key in designing and implementing possible interventions. First, it is important to use menus of options to avoid a “one-size fits all” approach. Significant differences and interests prevail between regions, and even between producers in the same region. Successful experiences provide insights, but mindless replication should be avoided. Second, the ability to integrate several links of the supply chain depends on the capabilities and willingness of the producer or producer group. Production options

must consider segments where capabilities, cost structure and time investment match the producers' interests.

Using a farm management perspective (not just livestock production), silvopastoral systems are analyzed at different scales of operation.

Low profitability is a constant for most small primary producers and their place near the bottom of the supply chain poses the greatest challenge; the distance between the producer and the final consumer prevents biodiversity-friendly practices from being scaled up to generate higher returns for local producers.

Source: Self-elaboration. See Annex 5: Figure 5.3.

Case study: Silvopastoral Systems

Silvopastoral systems require time for introduction of innovations, implementation and management; larger farms are able to better cope with these costs.

Throughout the supply chain, the major gap is in product collection, processing and sale to the final consumer. In most cases, significant difficulties in collection logistics and storage give rise to middlemen who assume the capital and product handling risks at different stages, thereby capturing benefits.

Thus, developing collection and processing centers for organized small operators, as well as strengthening institutionalization and governance processes, would reduce operating and financial costs. Local and regional market analyses—and even short-chain system analysis where there is a direct link between producers and final consumers—are also needed to tap potential niche markets, such as high-specialty coffees, native corn tortillas, and zero deforestation meat.

Signaling mechanisms such as voluntary stamps or certifications at low cost for local markets provide a way for differentiation of the destination market, offering better profitability rates or better positioning in the mind of consumers.

6 ACTIONS NECESSARY TO CONSERVE BIODIVERSITY AND TROPICAL FORESTS

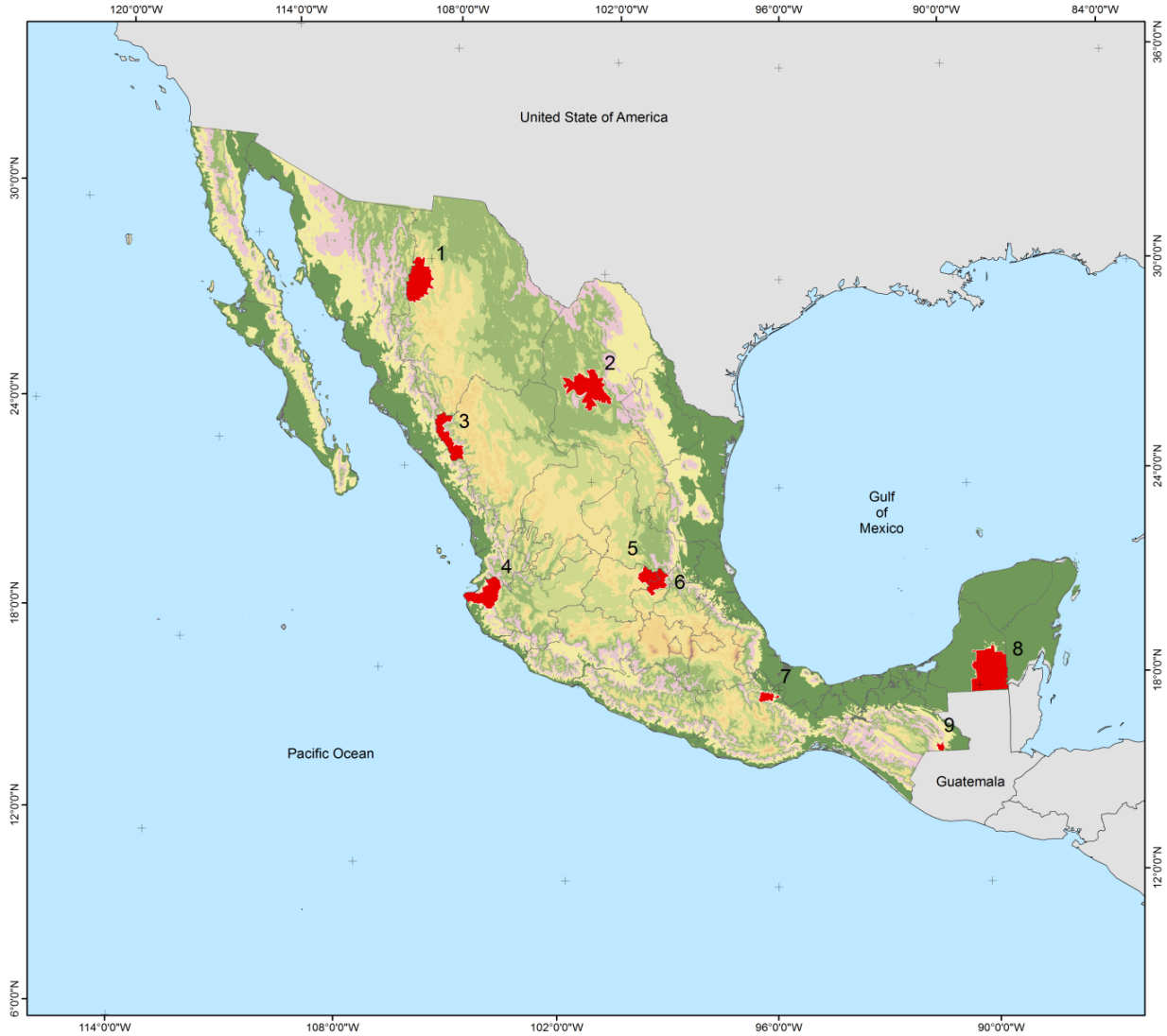
6.1 Priority Areas and USAID Mission Activities

The team identified priority regions for biodiversity and forest conservation. Sites were selected based on amount of areas with well-preserved ecosystems (i.e. under good conservation conditions) at a municipal level for the country, as well as their level of qualitative fragmentation. A differentiation was made between North, Center and South considering that there are significant differences in the magnitude of well-preserved ecosystems in each region and the level of fragmentation found (e.g. the Center and South Regions are more fragmented and less-well preserved compared to the North

Region). Two hundred municipalities were identified as priority areas under this first analysis.

The team integrated the first analysis described in the previous paragraph, with territorial management variables that indicate a degree of organizational and governance capacities on the ground. As a result, the team identified the 20 best-preserved municipalities classified in nine sites.

Figure 2 Map of Selected Priority Areas



These priority sites show the areas where best conditions of biodiversity prevail, where connectivity of habitats is desirable, and where land use change dynamics is observed. The selected areas show the sites where greatest impact is expected in two ways: a) the best conserved areas where productive activities are compatible with conservation outcomes; b) the most vulnerable areas where greater loss of primary habitats is found, but that are important for biodiversity and represent an opportunity for recovery or restoration.

Please refer to the Methodology section and Annex 1 for further detail. Municipalities for each site are listed in Table 8 bellow.

Table 8 Priority Areas: Municipalities by Region

North	Chihuahua	1. Madera
	Coahuila	2. Cuatro Ciénegas
	Durango	3. Tamazula
Center	Jalisco	4. Cabo Corrientes
		5. Mascota
		6. San Sebastián del Oeste
		7. Talpa de Allende
	Guanajuato	8. Atarjea
		9. Santa Catarina
		10. Victoria
		11. Xichú
	Querétaro	12. Pinal de Amoles
		13. Arroyo Seco
		14. Peñamiller
		15. Toliman
Southeast	Oaxaca	16. San Felipe Usila
		17. San Juan Bautista Valle Nacional
		18. Santa María Jacatepec
	Campeche	19. Calakmul
	Chiapas	20. Maravilla Tenejapa

6.2 Priority Actions

On the basis of the performed literature review, interviews, site visits, and gap analysis (Annex 8), the team agreed on 39 actions. These priority actions are organized into: a) Policy instruments; and b) Production and markets. Each category is divided into different types of instruments. Table 9 lists the number of priority actions in each category. Table 10 show the complete list of priority actions.

Table 9 Categories and Type of Priority Action

Policy and Public Programs	Number of Priority Actions	Production and Markets	Number of Priority Actions
Command and control	4	Planning and Governance	9
Conservation	5	Implementation of practices	6
Economic Instruments	4	Private sector	3
Planning and Governance	6	Finance	2

Table 10 Priority Actions

Category	Priority action and type
Policy Policy instruments	Command and control – 4 recommendations
	1. Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination) 2. Speed/strengthen the implementation of the Sustainable Forest Development Law 3. Continue working to enact laws for biodiversity conservation and for marine and coastal development 4. Enact state and local laws on forests and biodiversity
	Conservation – 5 recommendations
	5. Increase the area devoted to terrestrial natural protected areas to meet Aichi targets and complete and/or reform management plans. Work with the private sector and subnational governments. 6. Strengthen revenue sources for natural protected areas (e.g. charges, restoration subsidies, market opportunities) 7. Improve information and management of wetlands of international importance 8. Promote UMAs for hunting, fishing and breeding as a profitable and sustainable activities that preserve habitats and iconic species. 9. Integrate all the instruments outside NPAs with a comprehensive conservation strategy
	Economic Instruments – 4 recommendations
	10. Transit from subsidies to market instruments (charges, taxes, markets and private financing) 11. Remove environmentally harmful subsidies in energy, technology, water, fertilizers. 12. Improve valuation methods for ecosystems services and communicate them effectively. 13. Develop sustainable market opportunities in agriculture, fisheries, forestry, and tourism sectors.
	Planning and Governance – 6 recommendations
	14. Strengthen the legal basis for multiyear strategies. Use international commitments as a tool. 15. Establish solid institutional cross-sectorial bodies for policy planning and implementation. 16. Promote and establish monitoring, traceability & transparency platforms, including standardized Geographical Information System (GIS) platforms. 17. Extend the use of biological corridors. Advance the Productive Sustainable Territories (TPS) project. 18. Assure environmental integrity of signature projects and programs (e.g. Sembrando Vida) 19. Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, ejido, and forest communities, among others.
Production and markets	Planning and Governance – 9 recommendations
	20. Use regional and local governance schemes for focusing and prioritizing landscape management. 21. Promote coordination/working groups for key issues and landscapes. 22. Plan projects with phasing-out of grants and appropriation from producers. 23. Promote organization of producers and initial investment levels to achieve economies of scale.

Category	Priority action and type
	24. Prioritize multi-year scope and certainty for projects above amount of resources delivered. 25. Identify and engage a strategic champion / "broker" for key geographies and /or topics. 26. Document and monitor cases and projects supported to avoid overlap and duplication of efforts with other donors and implementing partners. 27. Integrate cultural considerations and local stakeholders in the design phase of projects. 28. Address pressing challenges (e.g. water scarcity)
	Implementation of practices – 6 recommendations
	29. Work with a menu of alternatives ("one-size does not fit all") and progressive phases to achieve the desired outcome. 30. Diversify income alternatives to enhance profitability, sustainability and resilience. 31. Add value through the right stakeholder, when considering integration of value chains and commercialization strategies. 32. Integrate connectivity by promoting sustainable productive landscapes. 33. Build capacities for certification / standards. 34. Build local stakeholders' financial and market capacities.
	Private sector – 3 recommendations
	35. Understand local markets and tap their potential. Differentiate intervention by type of market. 36. Engage by including biodiversity and forests into their core business. Invest in capacity building for the private sector. 37. Document the costs of inaction and quantifiable benefits of biodiversity and forests (e.g. insurance mechanisms, genetic resources for production improvement, etc.)
	Finance – 2 recommendations
	38. Support and work with private sector & development agencies to provide competitive financing (e.g. IDB-Lab)[30] 39. Include financial needs and possibilities at the planning stage.

6.3 Summary Table of Ranked Actions

The Analysis team ranked actions using these criteria: (a) how significantly the action addresses the identified threats; (b) how significantly it addresses the identified gaps, and (c) how feasible it is in terms of political will, existing technical capabilities and economic cost of implementation. Table 11 below shows the highest ranked actions.

[30] The IDB Lab is the innovation laboratory of the IADB Group. It seeks to "mobilize financing, knowledge, and connections to catalyze innovation for inclusion in Latin America and the Caribbean". See https://bidlab.org/en/about

Table 11 Ranked Actions

Category	Type	Ranked Actions	Priority (Average)
Policy and Programs	Governance	1. Strengthen the capacity of regional and local governance or collaboration schemes, including inter-municipal and watershed councils, biocultural landscape bodies, and *ejido* and forest communities, among others.	34.7
	Market development	2. UMAs - hunting, fishing and breeding as profitable activities that preserve environments and are sustainable over time	34
Production and Markets	Market development	3. Focus on diversification needed for profitability, sustainability and resilience.	34
	Planning	4. Address pressing challenges (e.g. water scarcity)*	33.5
Policy and Programs	Market development	5. Develop sustainable market opportunities in the agricultural, fisheries, forestry and tourism sectors	33
	Planning	6. Extend the use of biological corridors. Advance the Productive Sustainable Territories (TPS) project.	32.3
	Planning	7. Integrate all the instruments outside NPAs with a comprehensive conservation strategy	31
Production and Markets	Governance	8. Use regional and local governance schemes to focus and prioritize landscape management.*	31
	Market development	9. Organize producers and initial investment levels. Develop economies of scale.	30.5
Policy and Programs	Governance /Planning	10. Establish solid institutional cross-sectoral bodies for policy planning and implementation*	30
	Command and control	11. Strengthen enforcement capacity for existing laws and regulations (financial, technical, coordination)	30
Production and Markets	Market development	12. Build capacities for certification / standards	29.5
	Market development / Finance	13. Document the costs of inaction and the quantifiable benefits of B&F (e.g. insurance mechanisms, genetic resources for production improvement, etc.)	29.5
	Governance	14. Promote coordination/working groups for key issues and landscapes*	29

Finally, the team clustered actions into 10 actions necessary to conserve tropical forests and biodiversity since four of them were included as part of a more significant or comprehensive recommendation. Actions included as a more comprehensive recommendation are identified with an asterisk (*) in Table 11 above.

7 EXTENT TO WHICH THE MISSION MEETS THE IDENTIFIED ACTIONS NEEDED

This section describes how the Mission's current activities are contributing to sustainable management and conservation of tropical forests and biodiversity according to the identified ranked actions.

Table 12 Extent to which the Mission Meets the Identified Actions Needed

Actions necessary to conserve tropical forests and biodiversity	Extent to which the current DO contributes toward sustainable management and conservation of tropical forests and biodiversity
1. Promote UMAs for hunting, fishing and breeding as profitable activities that preserve habitats and species.	The Mission does not currently promote mechanisms such as UMAs for placing a value on biodiversity and regulation of populations.
2. Promote diversification of productive activities to enhance profitability, sustainability and resilience.	The DO promotes this by increasing the competitiveness of community-led sustainable farm and forestry businesses and by improving sustainable production practices in agroforestry and forestlands.
3. Promote organization of producers to achieve economies of scale.	The DO supports better management of community forests, increasing the capacity of community-based forest enterprises to reduce deforestation and forest degradation.
4. Build capacities for certification or standards schemes.	The DO operates programs for sustainable production practices and sustainable sourcing in agroforestry and forestlands (Rainforest Alliance) and enhances the capacity of community-based forest enterprises (Mexican Civil Council on Sustainable Forestry, CCMSS).
5. Document the value of ecosystem services to foster market mechanisms (e.g. insurance, genetic resources for production improvement, etc.)	The Mission does not currently address opportunities to document the value of ecosystem services through market mechanisms such as insurance.
6. Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.	The DO supports better management of community forests and increasing the capacity of community-based forest enterprises. Additionally, the DO contributes to USAID Local Systems objectives whose aim is to work hand in hand with local governance platforms and local stakeholders (See Annex 9 for further detail of the contribution of DO Sustainable Landscapes to USAID Local System Objectives)
7. Advance the use of biological corridors and projects already designed or in place	The DO works in locations and on projects developed by other institutions or by USAID in the past, such as Rainforest Alliance projects in Oaxaca, and provides continuing to support CONAFOR for implementation of a robust and transparent national forest inventory and monitoring system of Greenhouse Gas (GHG) emissions.
8. Integrate all instruments outside NPA through a comprehensive conservation strategy.	The Mission does not currently consider evaluating the integration of conservation instruments as part of a comprehensive strategy for Mexico.
9. Engage the private sector by including B&F into their core business and invest in their capabilities for sustainable performance	The DO engages the private sector by: increasing the capacity of community-based forest enterprises (working with specific sectors and value chains – CCMSS); b) assisting in developing partnerships with the public and private sectors for sustainable sourcing (Rainforest Alliance); c) designing effective carbon policy and business solutions in collaboration with the private sector and GOM (Communities and Renewable Energy); d)including private sector matching requirements as a criteria in their grants.

Actions necessary to conserve tropical forests and biodiversity	Extent to which the current DO contributes toward sustainable management and conservation of tropical forests and biodiversity
10. Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination)	The DO strengthens the legal, institutional, and public policy framework and the capacities in all sectors to use best practices for more participatory planning of energy projects. Also, the DO is helping to strengthen technical capacities for monitoring and transparency mechanisms in the forestry sector.

8 CONCLUSIONS AND RECOMMENDATIONS

Recommendations emerge from the analysis of the priority actions identified and the extent to which the Mission's current strategy and activities are meeting these actions. For each of the 10 actions necessary to conserve tropical forests and biodiversity, the team provide additional information and analysis in order to transform them into recommendations. The additional information and analysis focused on: a) its relevance or impact on the conservation and sustainable management of biodiversity and forests; b) specific activities recommended; c) the recommended sites or areas for its implementation; d) the other recommended priority actions that are related.

The image below summarizes the process followed in order to obtain the ten recommendations

8.1 Recommendations for Actions Necessary to Conserve Biodiversity and Tropical Forests in Priority Areas

8.1.1 Development of Markets and Market-Oriented Mechanisms

Recommendation 1: Promote UMAs for hunting, fishing and breeding as profitable activities that preserve habitats and species.

Impact on biodiversity and forests:

- Shown to improve the conservation status of priority target species.
- A means to document the value of biodiversity and regulation of populations, enabling communities and landowners to benefit economically from preservation and thus provide incentives for conservation. For example, hunting of desert sheep generates USD$40 million annually in the state of Sonora.
- Provide high Return on Investment (ROI) in the medium term (cash flow timeline: 10 years).
- Feasible means of managing implementation in areas that would otherwise be converted to other land uses.
- Have a legal and institutional framework in place. As of 2018, Federal programs with allocated budgets supported these activities.
- Example species impacted: crocodile, desert sheep, and white-tailed deer.

Recommended activities:

1. Provide technical assistance and technology transfer from states with ongoing activities.
2. Develop blended financing/co-financing mechanisms: a) establish a public-private revolving fund with participation of landowners and state and Federal governments under available programs and with bilateral institutions and development banks; b) use national development bank-funded microfinancing to complement other sources; c) reduce risk through commercial relationships with hunting clubs.
3. Monitor and estimate ecosystem carrying capacity by type of habitat and species, including ecosystem valuation in each case. Link financing to the recommendation in item 2 above.
4. Provide technical assistance for developing UMA business plans.

Potential actors to engage:

SEMARNAT; PROFEPA; National Service for Food Health, Safety and Quality (SENASICA); producer organizations; communities and *ejidos*; municipal authorities; international organizations and financial entities; Ministry of National Defense (SEDENA).

Recommended locations:

All regions in the prioritization process.

Related recommendations:

- Action 2: Promote diversification of productive activities to enhance profitability, sustainability and resilience
- Action 6: Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others

Recommendation 2: Promote diversification of productive activities to enhance profitability, sustainability and resilience.

Impact on biodiversity and forests:

- Reduces vulnerability to economic and environmental shocks and changes.
- Conserves soil and ecosystem services (e.g., increased pollination, less pest incidence, among others) through improved practices.
- Implementing improved practices helps reduce dependence on input providers and commercialization channels.
- Avoids “one-size fits all” solutions that lead to monoculture and practices that don’t conserve native species.

Recommended activities:

1. Identify key crops and areas of interest, as well as the network of stakeholders participating in innovation (see potential actors to engage).
2. Work with research centers, academia and producers to support developing or documenting technical menus suitable to specific crops and habitats.
3. Dialogue with companies that source from the selected areas and/or crops in order to link technical alternatives with private-sector needs.

4. Establish and formalize dialogue and collaboration platforms that serve as innovation networks with research centers, academia, producers and financial institutions.
5. Provide or communicate the developed menus of technical alternatives to state and federal government agencies for use as criteria in public programs.

Potential actors to engage:

National Institute for Agricultural, Livestock and Forestry Research (INIFAP), Academia (state universities, local research and technical centers); NGOs with technical expertise; producers; companies sourcing from selected crops and locations; financial institutions.

Recommended locations:

Chihuahua: Madera; Coahuila: Cuatro Ciénegas; Durango: Tamazula; Jalisco: Cabo Corrientes, Mascota, San Sebastián del Oeste, Talpa de Allende; Guanajuato: Atarjea, Santa Catarina, Victoria, Xichú; Querétaro: Pinal de Amoles, Arroyo Seco, Peñamiller, Toliman; Oaxaca: San Felipe Usila, San Juan Bautista Valle Nacional, Santa María Jacatepec; Campeche: Calakmul; Chiapas: Maravilla Tenejapa.

Related recommendations:

Action 6: Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.

Recommendation 3: Promote organization of producers to achieve economies of scale.

Impact on biodiversity and forests:

- Scattered small producers cannot achieve a minimum scale to be profitable. Larger scale operations that group producers make it possible to organize supply and reduce the transaction costs of technical assistance, financial services, inputs and transportation, thereby increasing profitability.
- Establishing sustainable value chains increases the feasibility of private sector involvement.
- Opens the possibility to design *ad hoc* financial instruments for investing in sustainable sourcing and transitioning from conventional practices to improved sustainable ones (assets, technical assistance, branding, etc.)

Recommended activities:

1. Identify market opportunities in priority regions, as well as potential partners for small producer engagement (buyers-companies, technical assistance providers, technology providers, etc.)
2. Work with not-for-profit or for-profit organizations experienced in assisting small producers with value chain integration and investing in long-term governance capabilities.
3. Design *ad hoc* financing mechanisms to help farmers profit from new organizational structures. Regionally or nationally, work with wholesalers and

financial institutions to develop competitive financial products. Organized groups of farmers can provide services at a regional scale for logistics and market information.

4. Use social media and other methods to raise awareness of sustainable land-based products and change target market consumer behaviors.
5. Prioritize using multi-year scopes of work and creating certainty over the amount of resources and plan interventions with a clear exit strategy (phasing out of grants and appropriations from producers).*

Potential actors to engage:

Producers of high-deforestation-impact products; regional and local universities and research centers; not-for-profit and for-profit organizations experienced in working with small farmers, private sector engagement, and articulation of value chains and markets; state governments; governance platforms; financial institutions (development banks, microfinance).

Recommended locations:

Chihuahua: Madera; Coahuila: Cuatro Ciénegas; Durango: Tamazula; Jalisco: Cabo Corrientes, Mascota, San Sebastián del Oeste, Talpa de Allende; Querétaro: Pinal de Amoles, Arroyo Seco, Peñamiller, Toliman; Oaxaca: San Felipe Usila, San Juan Bautista Valle Nacional, Santa María Jacatepec; Campeche: Calakmul; Chiapas: Maravilla Tenejapa.

Related recommendations:

- Action 1: Promote UMA for hunting, fishing and breeding as profitable activities that preserves habitats and species.
- Action 2: Promote diversification needed for profitability, sustainability and resilience.
- Action 4: Build capability for certification or standards schemes.
- Action 5: Valuation of ecosystem services to foster market mechanisms (e.g. insurance mechanisms, genetic resources for production improvement, etc.)
- Action 6: Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.
- Action 7. Advance the use of biological corridors and projects already designed or in place.

Recommendation 4: Build capacity for certification and standards programs.

Impact on biodiversity and forests:

- Increases the market value of goods and services that involve biodiversity and sustainable use, and therefore provides incentives for conservation.
- Increases price stability through commercialization channels.
- Ensures implementation of improved field practices.
- Standards schemes and certifications constitute initial steps toward traceability that can increase transparency.

Recommended activities:

1. Promote/support capacity-building by collaborating with organizations experienced in developing standards and those already working with producers and landowners.
2. Focus on high-value timber and non-timber products.
3. Focus on agricultural products that have a major impact on deforestation.
4. Support transparency and enforcement mechanisms linked to low-cost alternatives and market feasibility. Not all producers will use the same certification mechanisms. Voluntary standards or collective stamps may be developed.
5. Use social media and other methods to raise awareness of sustainable land-based products and change target market consumer behaviors.

Potential actors to engage:

NGOs with technical expertise; producers; companies sourcing from selected crops and geographies; SENASICA.

Recommended locations:

Chihuahua: Madera; Coahuila: Cuatro Ciénegas; Durango: Tamazula; Jalisco: Cabo Corrientes, Mascota, San Sebastián del Oeste, Talpa de Allende; Querétaro: Pinal de Amoles, Arroyo Seco, Peñamiller, Toliman; Oaxaca: San Felipe Usila, San Juan Bautista Valle Nacional, Santa María Jacatepec; Campeche: Calakmul; Chiapas: Maravilla Tenejapa.

Related recommendations:

- Action 2: Promote diversification of productive activities to enhance profitability, sustainability and resilience.
- Action 6: Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.

Recommendation 5: Document the value of ecosystem services and the costs of habitat loss to foster market mechanisms (e.g. insurance mechanisms, genetic resources for product improvement, among others).

Impact on biodiversity and forests:

- Manages risks related to climate change and natural shocks.
- Creates incentives for conservation.
- Engages the private sector by providing clear incentives and clarifying conservation investment risks and returns.
- Addresses positive externalities through market mechanisms.

Recommended activities:

1. Focus on existing or studied mechanisms: insurance for coastal resilience, climate-smart agriculture and ranching. Explore means for documenting the value of agro-biodiversity.
2. Promote or support regional and local studies for valuation of ecosystem services.
3. Communicate findings to the various potential stakeholders interested in investing in market mechanisms.

4. Engage with potentially interested private entities (e.g. insurance companies, seed companies, and tourism and hotel sectors).

Potential actors to engage:

Universities, government research institutions, think tanks; Insurance companies, seed companies, the tourism and hotel sector.

Recommended locations:

All regions seen in the prioritization process, plus the Riviera Maya region.

Related recommendations:

- Action 1: Promote UMAs for hunting, fishing and breeding as profitable activities that preserves habitats and species.
- Action 2: Promote diversification needed for profitability, sustainability and resilience.
- Action 4: Build capacities for certification or standards schemes.
- Action 6: Strengthen the capacity of regional and local governance or collaboration schemes, including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.

8.1.2 Governance

Recommendation 6: Strengthen the capacity of regional and local governance or collaboration schemes, including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.

Impact on biodiversity and forests:

- Articulates policies and activities at a landscape level.
- Focuses resources and prevents scattered efforts.
- Creates sustainability over time and increases certainty of actions.
- Increases possibilities for achieving economies of scale.

Recommended activities:

1. Strengthen programs by providing facilitation for:
   a. Identifying and engaging with on-site conveners.
   b. Collaboration and joint efforts with other donors.
2. Use existing regional and local governance schemes as the arenas for focusing and prioritizing landscape management—could include inter-municipal associations, watershed councils or biocultural landscape groups.
3. Promote coordination/working groups for key issues and landscapes to develop a common agenda.*
4. *Establish and/or strengthen institutional cross-sectoral bodies for policy planning and implementation** through legal frameworks and increased visibility that enable them to have more impact. Identify existing governance schemes and engage those institutional bodies in recommended sites.
5. Use social media and other methods to raise awareness of sustainable land-based products and change target market consumer behaviors.

Potential actors to engage:

Donors; inter-municipal associations; Federal and state governments; regional collaboration platforms such as biocultural corridors and landscapes, *Centro de integración de la biodiversidad,* in SADER.

Recommended locations:

Municipalities in Jalisco where inter-municipal associations operate, PUUC Region in Yucatan, Biodiversity Conservation project in the Neovolcanic Axis (COBEN) in Sierra Gorda (Queretaro and Guanajuato).

Related recommendations:

All other recommendations are related.

8.1.3 Planning and Management

Recommendation 7. Advance the use of biological corridors and projects already designed or in place.

Impact on biodiversity and forests:

- Encourages a comprehensive landscape planning and management approach instead of sectoral and administrative approaches that lead to unintended consequences.
- Fosters connectivity between protected areas.
- Develops regional and local markets taking landscape dynamics into account.
- Enhances livelihoods and preservation of cultural heritage in the areas connecting biodiversity; works to contain migration flows.
- Scales up market opportunities, value chains, and innovation networks at the landscape level.

Recommended activities:

1. Identify opportunities for intervention, matching funds, governance efforts focusing on projects already designed or in place (e.g., TPS- Sustainable Productive Territories).*
2. Include income, market and cultural criteria in selecting projects to enable congruency at a landscape level, as well as habitat connectivity.
3. Align incentives and public policies with a landscape approach to foster productive activities and reduce unsustainable practices. *Integrate connectivity through sustainable productive practices.**
4. Provide means for broad participation in developing and implementing high-quality community land management plans.
5. Link initiatives with governance structures and collaboration platforms between municipalities, states or other stakeholders (inter-municipal associations, biocultural landscapes, private initiatives, watershed councils, etc.)
6. Strengthen the legal basis for multi-year strategies using international commitments as a tool.*

Potential actors to engage:

Donors; inter-municipal *juntas* or associations; state governments; regional collaboration platforms such as biocultural corridors and landscapes; communities, *ejidos* and private owners, fishing communities; for-profit and not-for-profit organizations experienced in working with small farmers, private-sector engagement, articulation of value chains and markets; wholesale buyers and companies

Recommended locations:

Further study is needed to define areas that promote connectivity. The cartographic tool and analysis provided can be used to process data for this purpose.

Related recommendations:

- Action 1: Promote UMA for hunting, fishing and breeding as profitable activities that preserves habitats and species.
- Action 2: Promote diversification of productive activities to enhance profitability, sustainability and resilience.
- Action 4: Build capacities for certification or standard schemes.
- Action 6: Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.

Recommendation 8: Promote the integration of all instruments outside NPAs through a comprehensive conservation strategy.

Impact on biodiversity and forests:

- Strengthens implementation of conservation instruments such as RAMSAR sites, watershed areas, turtle nesting beach sites, UMAs, ADVCs, sustainable forest management, and other organizations.
- Articulates policies, activities and stakeholders at a landscape level
- Focuses resources and prevents scattered efforts
- Fosters sustainability over time and increases certainty of actions
- Increases the potential for economies of scale
- Generates additional income from NPAs, including ADVC, and sustainable conservation schemes.*

Recommended activities:

1. Support the GOM or other organizations to convene actors from private, public and social sectors to agree on common goals and strategies and integrate a landscape management plan using existing instruments (RAMSAR, forest management, etc.).
2. Create or provide participatory development and effective implementation of high-quality community land management plans.
3. *Address pressing challenges (e.g. water scarcity)** as a pivot for engaging partners and developing solutions.

4. Strengthen revenue sources for NPAs (e.g. charges, restoration subsidies, market opportunities):
5. Develop sustainable management business plans for NPAs and other conservation programs that generate income (e.g. NPAs with tourist/archeological attractions currently under management with the National Institute of Anthropology and History (INAH)-CONANP; complement UMAs or other models with NPAs).
6. Integrate monitoring and control models in those areas.
7. Strengthen the legal basis for multi-year strategies using international commitments as a tool.*

Potential actors to engage:

Federal government (CONANP, INAH, SEMARNAT, PROFEPA, CONAFOR).

Recommended locations:

National scale – Policy recommendations

Related recommendations:

- Action 1: Promote UMAs for hunting, fishing and breeding as profitable activities that preserves habitats and species.
- Action 2: Promote diversification needed for profitability, sustainability and resilience.
- Action 4: Build capacities for certification or standard schemes.
- Action 5: Document the value of ecosystem services to foster market mechanisms (e.g. insurance mechanisms, genetic resources for production improvement, etc.).
- Action 6: Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.
- Action 7. Advance the use of biological corridors and projects already designed or in place.

8.1.4 Boost private sector participation for conservation and sustainable use

Recommendation 9: Engage the private sector by relating biodiversity and forest conservation to their core businesses, and invest in their capabilities for sustainable performance.

Impact on biodiversity and forests:

- Sets conservation goals in terms of private-sector business objectives in order to encourage private-sector engagement; for example, through valuation of ecosystem services.
- Incorporates private firms in the supply chain as driving forces for sustainable sourcing.
- Reduces and manages financial and environmental risk in collaboration with stakeholders in supply chains.
- Develops markets for sustainable sourcing and provision of goods and services.

Recommended activities:

1. Identify and capitalize international commitments made by companies regarding sustainable sourcing, zero deforestation, etc.
2. Communicate to the private sector the economic value of ecosystems, ecosystem services and benefits of working with communities and landowners for conservation. Documenting case studies in various economic sectors may be effective.
3. Document and communicate market intelligence regarding sustainable sourcing in terms of market opportunities, reputation risks, reliable sourcing, and climate risk resilience*. Invest in understanding local and regional market* dynamics.*
4. Identify and work with company leaders to understand their pressing challenges and how innovation can address them with sustainable solutions (activities, products and services).
5. Promote innovation networks with the private sector, not-for-profits, universities and producers in developing sustainable solutions.
6. Explore *ad hoc* financial mechanisms in light of identified threats, products and regions: Articulate these with local markets and value chains; collaborate with private-sector institutions and financial agencies (e.g. BID-Lab) in pre-competitive spheres for developing blended finance.
7. Use social media and other methods to raise awareness of sustainable land-based products and change target market consumer behaviors.

Potential actors to engage:

Companies that source from high-deforestation-impact products*;* producers of high deforestation products*;* regional and local universities and research centers*;* not-for-profit and for-profit organizations with experience working in private sector engagement, articulation of value chains and markets; state governments; governance platforms

Recommended locations:

All regions in the prioritization process

Related recommendations:

- Action 2: Promote diversification needed for profitability, sustainability and resilience
- Action 3: Organize producers to achieve economies of scale
- Action 4: Build capacities for certification or standards schemes
- Action 5: Document the value of ecosystem services to foster market mechanisms (e.g. insurance, genetic resources for production improvement, etc.)
- Action 6: Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others
- Action 7. Advance the use of biological corridors and projects already designed or in place

8.1.5 Command and control

Recommendation 10. Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination).

Impact on biodiversity and forests:

- Addresses illegal extraction and trade in forest products and wildlife. (e.g., experts estimate that almost half of the timber sold in Mexico comes from illegal sources)
- Addresses the potential link between wildlife and illegal logging and other felonies and organized crime.
- Increases the value and market potential of legally produced sustainable products, including crops, sustainably produced timber and wildlife
- Improves safety conditions and the wellbeing in rural communities, especially those interacting with biodiversity hotspots.

Recommended activities:

1. Provide training programs and monitoring and surveillance systems to increase the resources and technical capacity of law enforcement agencies such as federal and state environmental agencies.
2. Create standardized and automated processes and foster intra- and inter-agency coordination.
3. Introduce intelligence systems for compiling, validating and analyzing data; and for field, geospatial and financial intelligence and operations protocols.
4. Enhance information technologies using integrated systems, big data, remote surveillance, GIS, and expert systems.
5. Improve public participation though citizen watchdogs, advisory councils, public consultations, complaint programs, citizen networks, and participatory oversight bodies.
6. Improve coordination and operations capacity with state, local and international enforcement agencies.
7. Create or provide participatory development and effective implementation of high-quality community land management plans.

Potential actors to engage:

PROFEPA; Federal law enforcement, police and defense authorities; international and subnational environmental enforcement counterparts; universities and research centers, both regionally and locally; civic and business organizations at the local level; rural community and ejido organizations.

Recommended locations:

All regions in the prioritization process.

8.2 Conclusions Regarding USAID/Mexico's Current CDCS and Biodiversity and Forest Conservation

There are opportunities for synergies and collaboration between the DO1-3 and DO4 to enhance biodiversity and forest conservation in Mexico, which are important given the following circumstances:

- Current smaller federal government budgets can weaken institutions and leave room for illegal activities;
- Lack of transparency in sourcing (crops, timber, etc.) leads to overexploitation and opportunities for illegal activities (e.g. money laundering);
- Inadequate law enforcement capabilities in areas with environmental problems lead to impunity; and
- Stronger civil society is a key pillar for protection of biodiversity and forests.

Table 13 below synthesizes the key recommendations for each DO under their current CDCS.

Table 13 Opportunities for further collaboration between DO4 and other DOs for biodiversity and forest conservation

DO	Recommendation	Type
DO 1: Crime & Violence Prevention	**DO1.1** Evaluate the feasibility of working in the same areas as DO4, and target rural populations for addressing illegal and criminal activities that cause deforestation and biodiversity loss. Focus on prevention and creating incentives; for example, integrate young people into programs, encourage social enterprises, undertake violence prevention programs, etc. in key rural areas.	**Opportunistic**: Working within the boundaries of programs to improve the extent to which the Mission is engaged in actions necessary to reduce threats.
DO 2: Justice Reform	**DO2.1** Support environmental sector judges, provide training, and reduce impunity in environmental issues (e.g. increase prosecutorial and judicial capacity and build legal institutions' analytical capacity.)	**Proactive**: Adapting programs to improve the extent to which the Mission is engaged in actions necessary to reduce threats.
DO 3: Human Rights	**DO3.1** Incorporate environmental defenders as part of the human rights agenda (documenting and analyzing aggressions, building capacity in government institutions, prevention, etc.).	**Opportunistic**: Working within the boundaries of programs to improve the extent to which the Mission is engaged in actions necessary to reduce threats.
DO3: Transparency and Integrity	**DO3.2** Collaborate with DO4 in enhancing transparency for improving legality and traceability in the forestry sector, agricultural crops that have a significant impact on deforestation as well as important species of plants and animals.	**Direct Threat Reduction**: Designing with the explicit objective of reducing threats or otherwise contributing to biodiversity conservation.

8.3 Opportunities to Integrate Biodiversity and Forest Conservation into the current CDCS Priorities for Mexico

In this section the team suggest areas of opportunity for the current CDCS given the current GOM's priorities. The current federal administration has indicated the signature projects to be developed for the next six years. Priorities do not include an explicit environmental agenda, and signature projects have raised concerns due to their potential negative impacts on habitats, including the *Sembrando Vida* Program, the Tren Maya, the Felipe Ángeles Airport in Santa Lucía, and the Dos Bocas Refinery. Furthermore, the National Development Plan is vague regarding environmental and natural resource goals (See Annex 11 for more details on the GOM's current priorities). This sets the context for opportunities for donors and stakeholders in rural areas to collaborate in addressing urgent challenges for biodiversity and forest conservation. Table 14 shows opportunities

for integrating Biodiversity and Forest Conservation into priorities and activities in the current CDCS.

Table 14 Integration of Biodiversity and Forest Conservation into the current CDCS

General actions needed to conserve tropical forests and biodiversity	Opportunities to integrate Biodiversity and Forest Conservation
1. Promote UMAs for hunting, fishing and breeding as profitable activities that preserve habitats and species.	a. Include specific diversification activities by providing systematized options. b. Implement a knowledge-sharing mechanism within the program and its partners.
2. Promote diversification of productive activities to enhance profitability, sustainability and resilience.	
3. Promote the organization of producers to achieve economies of scale.	c. Include a specific requirement for promoting organization structures and methodologies as a means to increase profitability and develop market and financial strategies.
4. Build capacities for certification or standards schemes.	d. More explicitly integrate capacity-building for certification and standards schemes. e. Capitalize the knowledge of the implementing agencies and partners already working on this topic. f. Implement a knowledge-sharing mechanism within the program and its partners.
5. Document the value of ecosystem services to foster market mechanisms (e.g. insurance, genetic resources, production improvement, etc.)	g. Support developing data on this topic. Make these data available to foster market mechanisms. h. Promote dialogue with the private sector and explore market possibilities (e.g. insurance considering green infrastructure for risk mitigation).
6. Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejidos* and forest communities, among others.	i. Support and work with regional and local governance or collaboration schemes. j. Link DO work with existing collaborative and governance platforms. k. Promote synergies between donors in specific locations and topics.
7. Advance the use of biological corridors and projects already designed or in place	
8. Integrate all instruments outside NPAs through a comprehensive conservation strategy.	
9. Engage the private sector by including biodiversity and forest conservation into their core businesses and invest in their capabilities for sustainable performance	l. Work more closely with company leaders and divisions to identify opportunities for including sustainability in their core businesses. m. Build on recommended actions: Valuation of ecosystem services, capacities for certification or standard schemes, promote organization of producers, promote diversification of productive activities.
10. Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination)	n. Build capacities of federal and subnational environmental enforcement authorities with training activities and interaction with US authorities with similar mandates. o. Support PROFEPA in establishing automated monitoring and operation systems to streamline its

General actions needed to conserve tropical forests and biodiversity	Opportunities to integrate Biodiversity and Forest Conservation
	processes and make its detention actions more reliable and efficient. p. Build on the model applied by USAID DO1 in involving citizens and the private sector to engage the public, rural communities, the private sector and local stakeholders in monitoring, reporting and helping to eliminate violations of environmental law.

Finally, the 10 key recommendations described in section 7.1 and Opportunities for further collaboration between DO4 and other DOs (see Table 13) were cross-checked with the Potential Strategic Approaches of the USAID/Mexico Environment Program. These Strategic Approaches are a work in progress for the design of the 2020-2024 CDCS (See Annex 15). Table 15 shows the relationship between the recommended actions and the Potential Strategic Approaches.

Table 15 Strategic Approaches cross-checked against USAID/Mexico Environment Program

Strategic Approach stated for the design of the 2020-2024 CDCS		Recommendations for actions necessary to conserve biodiversity and tropical forests in priority areas (DO4) & Recommendation for DO1, DO2, DO3 and cross-cutting *Transparency and Integrity*
1.	Strengthen governance and political will for reducing GHG emissions from natural capital.	4,5,6,7,8,9,10
2.	Strengthen the enforcement and justice system for improved management of natural capital.	DO1.1; DO2.1, DO3.1, Trans.1
3.	Improve community access to markets for agricultural, livestock, timber, non-timber forest products, carbon, and ecosystem services.	1,2,3,4,6,7
4.	Increase appropriate financing for communities to engage with markets for sustainable community agricultural, livestock, timber, non-timber forest products, carbon, and ecosystem services.	1,2,3,4,5,9
5.	Build consumer preference for sustainably produced products.	3,4,5,6,7
6.	Support the participatory development and effective implementation of high-quality community land management plans.	6,7,8,10
7.	Improve the management of protected natural areas with large carbon sequestration potential.	10
8.	Support good agroforestry practices on degraded lands.	1,2,4
9.	Improve livestock production practices to reduce emissions from current business-as-usual (BAU) levels.	1,2,4,9

Strategic Approach stated for the design of the 2020-2024 CDCS		Recommendations for actions necessary to conserve biodiversity and tropical forests in priority areas (DO4) & Recommendation for DO1, DO2, DO3 and cross-cutting *Transparency and Integrity*
10.	Improve agricultural production practices to reduce emissions as compared to BAU.	1,2,4,9

This report has attempted to identify the key changes in biodiversity and forest in Mexico since 2013. It has provided general recommendations for biodiversity and forest conservation and specific ones for USAID Mission in Mexico. Due to current conditions and circumstances, the team observe significant opportunities for collaboration among stakeholders, particularly donors and civil society organizations, as well as to strengthen existing efforts and governance platforms.

9 LIST OF ANNEXES

Due to the amount and complexity of information, Annexes are included as part of the document to expand information on scope of work, methodologies used, references, data, field visits and interview results, as well as further analysis as needed. The annexes included are as follows:

Annex 1. Scope of Work
Annex 2. Team Structure and Biographical Summaries
Annex 3. List of Documents Consulted
Annex 4. List 0f Individuals Consulted
Annex 5. Maps, Tables, and Graphics
Annex 6. Site Visit Details and Case Studies
Annex 7. Identified Threats to Biodiversity and Forest Conservation
Annex 8. Identified Gaps to Effectively Address Biodiversity and Forest Conservation
Annex 9. Contribution of DO Sustainable Landscapes to USAID Local System Objectives
Annex 10. Government of Mexico Federal Priorities for 2019-2024
Annex 11. Goals and Actions Related to Biodiversity and Forest Conservation in Non-Environmental Sectoral Programs 2013-2018
Annex 12. Genetic Diversity Key Crops
Annex 13. Summary of Interview Results
Annex 14. Cartographic Inventory

ANNEX 1. SCOPE OF WORK

Interview Guides and Questionnaires

Guía para entrevista: Proyectos de campo
Análisis de la Biodiversidad y Bosques Tropicales en México
Foreign Assistance Act (FAA) -118 & 119
Presentación

Gracias por recibirnos. Mis colegas y yo formamos parte de un equipo de consultores contratados para realizar un análisis de la biodiversidad y los bosques tropicales en México. Dicho estudio proveerá de información a la Misión de USAID en México para la elaboración de su Estrategia de Cooperación a nivel país 2020-2025.

Nuestro objetivo es proveer la mejor información disponible así como sugerencias para que la Estrategia País que USAID determine contribuya de la mejor manera a la conservación de la biodiversidad y de los bosques y selvas en México, tal como lo requiere la legislación norteamericana.

De forma específica, buscamos:

1. Identificar las acciones necesarias para que México logre la conservación y manejo sostenible de los bosques tropicales y la conservación de la diversidad biológica.
2. La identificación de la medida en la que las acciones apoyadas por USAID/México abonan a las necesidades identificadas.

Para esta entrevista, nos gustaría conocer más sobre experiencias positivas y negativas que existen en campo en relación a la conservación de la biodiversidad, así como a la conservación y manejo sostenible de bosques y selvas en México.

La información que pueda proveernos será muy importante y valiosa. Gracias de antemano por su tiempo y respuestas.

Nombre del Entrevistado:	Fecha de entrevista:...../...../.....
Cargo del Entrevistado:	Nombre del Entrevistador:
Localidad:	Tipo de proyecto:

PREGUNTAS

Características generales	
1. Describa brevemente de que se trata su proyecto. ¿Cuáles son las tres prioridades o líneas de trabajo principales de su proyecto / unidad productiva / etc.?	

1. ¿Qué metas se han fijado en el corto y mediano plazo (1 año / 5 años)? Mencione los aspectos productivo, económico y ambiental.	
1. ¿Qué prácticas productivas mejoradas y sostenibles ha implementado en su proyecto? a. ¿Qué beneficios observa? b. ¿Cómo ha enfrentado los costos que implican?	
Biodiversidad y bosques	
1. En su proyecto, ¿cuáles son las amenazas más significativas para la conservación de la biodiversidad y el manejo sostenible de los bosques y selvas?	
1. ¿Qué actividades en su proyecto están dirigidos a la conservación de la biodiversidad y el manejo sostenible de los bosques y selvas? a. ¿Cómo es que esas actividades abordan las amenazas identificadas (pregunta 2)? b. ¿Cuánto presupuesto se le destina? c. ¿Se mide el desempeño? d. ¿Qué criterios de evaluación o medición puede sugerir en la materia?	
1. ¿Puede mencionar cambios significativos (avances o retrocesos) de los últimos cinco años, en la conservación de la biodiversidad y el manejo sostenible de bosques y selvas en la región en donde trabaja?	
1. Mencione tres sugerencias para mejorar el desempeño de su proyecto en el tema de conservación de biodiversidad y conservación/manejo sostenible de bosques y selvas.	
1. En función de la eficacia para conservar biodiversidad y bosques, por favor priorice las intervenciones siguientes de mayor a menor importancia para su región o proyecto.	1 Manejo forestal sustentable 2 Ganadería extensiva sustentable 3 sistemas agrosilvipastoriles 4 Cadenas apícolas 5 cadenas de producción y comercializadoras de café 6 cadenas de producción y comercializadoras de cacao 7 cadenas de maíz -milpa 8 Desarrollo y manejo de UMAS 9 Turismo de naturaleza 10 Pesca sustentable 11 Restauración de suelos 12 pago de servicios ambientales

Escalamiento y redes locales	
1. Qué actores u organizaciones han sido socios clave para fortalecer el actuar de su proyecto? a. ¿Qué ha funcionado bien o mal dentro de dichas colaboraciones?	
1. ¿Qué factores han sido más importantes para el avance positivo /éxito de su proyecto?	
1. ¿Cómo mide el avance de su proyecto? a. ¿Qué es importante medir en su proyecto? b. Sugiera formas de medir la dimensión productiva y los impactos ambientales.	
1. ¿Cuál es la mejor forma de aprender y adoptar mejoras productivas que sean sustentables?	

¿TIENE ALGUNA PREGUNTA PARA NOSOTROS?
MUCHAS GRACIAS POR SU TIEMPO.

Guía para entrevista: Actores relevantes
Análisis de la Biodiversidad y Bosques Tropicales en México
Foreign Assistance Act (FAA) -118 & 119
Presentación

Gracias por recibirnos. Mis colegas y yo formamos parte de un equipo de consultores contratados para realizar un análisis de la biodiversidad y los bosques tropicales en México. Dicho estudio proveerá de información a la Misión de USAID en México para la elaboración de su Estrategia de Cooperación a nivel país 2020-2025.

Nuestro objetivo es proveer la mejor información disponible así como sugerencias para que la Estrategia País que USAID determine contribuya de la mejor manera a la conservación de la biodiversidad y de los bosques y selvas en México, tal como lo requiere la legislación norteamericana.

De forma específica, buscamos:

1. Identificar las acciones necesarias para que México logre la conservación y manejo sostenible de los bosques tropicales y la conservación de la diversidad biológica.
2. La identificación de la medida en la que las acciones apoyadas por USAID/México abonan a las necesidades identificadas.

Para esta entrevista, nos gustaría conocer más sobre:

a. [Gobierno]. Las prioridades y metas que el actual gobierno mantiene para la conservación de la biodiversidad, la conservación y manejo sostenible de bosques y selvas en México.
b. [Agencias internacionales, donantes, ONG]. Las líneas prioritarias de inversión y actividades que su organización mantiene para la conservación de la biodiversidad, y la conservación y manejo sostenible de bosques y selvas en México.
c. [Expertos]. Retos y oportunidades para la conservación de la biodiversidad, la conservación y manejo sostenible de bosques y selvas en México.

La información que pueda proveernos será muy importante y valiosa. Gracias de antemano por su tiempo y respuestas.

Nombre del Entrevistado:	Fecha de entrevista:...../...../.....
Cargo del Entrevistado:	Nombre del Entrevistador:

Interview Guide: USAID DO Lead Officers
Biodiversity and Tropical Forests Assessment for Mexico
Foreign Assistance Act (FAA) -118 & 119
Introduction

Hello. My name is _____. My colleagues and I are contractors of USAID Mission in Mexico. We are working on an analysis of the state of biodiversity and tropical forests in Mexico that will inform USAID/Mexico for the development of its Country Development Cooperation Strategy (CDCS) for 2020-2025.

As you know, the purpose of this analysis is to provide useful information and insights for USAID/Mexico to define to what extent the CDCS will contribute to biodiversity conservation needs in Mexico.

The specific objectives are:

1. The identification of necessary actions in Mexico to achieve the conservation and sustainable management of tropical forests and the conservation of biological diversity;
2. The identification of the extent to which the actions proposed for support by USAID/Mexico meet the needs thus identified. Particularly, it will identify strategic linkages and highlight opportunities to integrate tropical forest and biodiversity conservation into priority development sectors identified in the CDCS.

For this interview, we would like to learn more of how the Mission perceives the integration of biodiversity and tropical forest conservation and management in the program that you lead.

The information you provide us is very important and valuable. Thank you in advance for your time and responses.

Name of Program:	Date of Interview:...../...../.....
Name of Interviewee:	Designation of Interviewee:
Name of Interviewer(s):	

Methodology: Selection of priority areas

The team prioritized regions for developing biodiversity management projects in two stages. First, primary habitat conservation was evaluated in light of: a) sustainable management opportunities (UMAs, areas selected for the TPS project, forest management areas and ADVC: columns 8, 9, 10 and 11), and b) areas with better biodiversity conditions (column 4), and the main productive activity (column 12). For environmental criteria, the team focused on ecosystem integrity, biological corridors for biodiversity conservation, and the use of soil and vegetation classified by their dynamics of land-use change. We included the loss of primary habitats, maintenance of primary vegetation cover and gains in vegetation cover. Based on this dynamic, a geographic information system provided a basic overlay of thematic cartography, applying values of High, Medium and Low for conservation criteria (column 4). Criteria and information for the nine selected sites appear in Annex 5: Table 7.1.

By integrating the conservation criteria and combining them with the territorial management variables (UMAs, TPS project areas, areas under forest management and ADVC), we identified 200 priority municipalities for biodiversity conservation at the national level. Based on this initial prioritization, we identified the 20 best-preserved municipalities classified in nine sites under the following criteria: for the North Region, municipalities with 80% conserved territory, for the Center Region 30% and for the South 40%.

In a second stage, we developed a model of association between these habitats' conservation status, vegetation cover loss and current land uses. Land use was determined considering the area used for the main productive activities (those with higher economic contribution to the municipality were analyzed), selecting among the following: forest production, UMAs, traditional agriculture, agroforestry and pasture management. We used a statistical contribution model of the variance of the analyzed variables, in this case the variance between the state of primary habitat conservation, vegetation cover loss and land uses. We performed two regressions: one where reduced primary habitat loss was the dependent variable, and other where the conservation of the current primary habitats was the dependent variable. In both cases the independent variables were the land uses in the municipalities included in the analysis sites.

The determination of the exact contributions and the statistical significance of each explanatory variable to the variance of a dependent variable in a regression is an important topic in applied economics. The most-common approach is to use regression procedures through steps and significance tests, but the regression method by steps is arbitrary in nature, while significance tests do not always allow us to classify the explanatory variables in order of importance. A systematic way of quantifying the different

contributions of the explanatory variables to a regression's goodness of fit should undoubtedly be useful in several research fields (Israeli, 2007).

Decomposition processes could be applied to a linear regression analysis to estimate the contributions of the explanatory variables to the dispersion of the dependent variable. The method first developed by Shapley (1953) estimates the relative contributions of the different explanatory variables in a linear regression to their R-squared. Remember that the contributions of the different explanatory variables to the R-squared are really the percentage of how much these variables contribute to the variance of the dependent variable (Olivera et al, 2019).

Table 9 Habitat variables

VARIABLES	(1) Reduce loss of primary habitat	(2) % explanation	(3) Maintain the current coverage of primary habitats	(4) % explanation
Forestry	-0.818**	3.7382	1.128**	5.0337
	(0.0337)		(0.0814)	
UMAS	-1.145**	5.8883	1.461*	6.0865
(animal handling unit)	(0.0760)		(0.183)	
Agriculture	-0.742**	26.1435	0.863**	23.5965
(Corn, Bean)	(0.0215)		(0.0518)	
Agroforestry	-7.451**	13.009	9.166**	12.876
	(0.234)		(0.565)	
Pastures	-0.440**	24.1071	0.518*	27.0321
	(0.0237)		(0.0571)	
number of agrarian nuclei	0.692**	9.4506	-0.919*	8.4042
	(0.0311)		(0.0750)	
Oaxaca	240.0**	17.6632	-296.6**	16.971
	(7.889)		(19.04)	
Constant	61.50**		28.20*	
	(1.435)		(3.462)	
Observations	9		9	
R-squared	0.999		0.998	
Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1				

We conclude that more impact can be achieved by investing jointly in activities for reducing habitat loss and conserving existing primary vegetation areas. As shown in columns 2 and 4 in Table: *Habitat variables* above, investment in improving farm practices and including biodiversity-friendly systems—such as milpa (26%) and investments destined to silvopastoral systems (27%)—have much more impact than investment in agroforestry systems like coffee and cocoa (13%) or UMAS (6%). This is because crop farming, particularly grains, is the strongest driver of land use change and degradation.

The prioritization in Table: *Prioritization of habitat conservation* below indicates that the highest-impact investments for habitat conservation are in the states of Campeche and Jalisco. If the key objective is to recover degraded areas, the highest-impact investments will be in Chiapas and Oaxaca.

Table: Prioritization of habitat conservation

Prioritization	Reduce loss of primary habitat	Prioritization	Maintain the current coverage of primary habitats	Prioritization	Reduce losses and preserve primary coverage
Campeche	1	Jalisco	1	Campeche	1
Jalisco	0.89636892	Campeche	0.99002692	Jalisco	0.95065767
Guanajuato	0.85246231	Chihuahua	0.87673676	Durango	0.86326336
Durango	0.85120662	Durango	0.86771777	Chihuahua	0.86020932
Chihuahua	0.83703834	Guanajuato	0.83880386	Guanajuato	0.84997538
Querétaro	0.7752389	Querétaro	0.75852177	Querétaro	0.77090547
Oaxaca	0.71515938	Coahuila	0.73655748	Oaxaca	0.72828578
Coahuila	0.62907531	Oaxaca	0.73524534	Coahuila	0.68393571
Chiapas	0.53571307	Chiapas	0.52327475	Chiapas	0.53229112

* Higher numbers in Table 10 show a greater significance. Investments for conservation or maintenance of primary habitat will be more cost-effective.

ANNEX 2. TEAM STRUCTURE AND BIO-SKETCHES OF ANALYSIS TEAM

The analysis team is composed of a Team Leader, a Data Analysis and Mapping Specialist, an Economic Growth/Livelihood Specialist, and an Implementation and Policy Specialist.

Team Leader

Maria E. Martinez Murillo C. Maria is a consultant with expertise in the agricultural sector and sustainable development. Until 2018, she worked for The Nature Conservancy, first as Monitoring and Evaluation Specialist for the MREDD+ program, and later as Sustainable Intensification Specialist linking strategies for agriculture, conservation, and partnerships. She also served as Chief of Party for the MREDD+ program and as Interim Lands Director for Mexico and North Central America.

Her experience in the public sector includes serving as Undersecretary of Rural Planning in Jalisco, where she developed a comprehensive agenda for key value chains, innovative capacity building strategies and stakeholder engagement. She was also Executive Coordinator for the Diagnosis of Property Rights in Mexico, at the Ministry of Social Development; served at the Federal Commission for Regulatory Improvement (COFEMER); and also worked for the *Mexico Business Forum* (MBF), an associate firm in Mexico of the *Economist Intelligence Unit*. She holds a BA on International Relations from the Instituto Tecnológico Autónomo de México (ITAM), a MA on Development Economics with specialization in Agriculture and sustainability from The Fletcher School of Law and Diplomacy, Tufts University; she studied the MA program in Politics and Public Policy at the Instituto Tecnológico de Estudios Superiores de Occidente (ITESO) and has been a Fulbright-Garcia Robles.

Policy and Implementation Specialist

Enrique Lendo. Enrique is an economist from the Monterrey Institute of Technology with a Masters on Public Affairs from Indiana University. Over the past 20 years, he has worked in the areas of environment, international cooperation and sustainable development for governments, the private sector and international organizations.

From 2007 to 2018 we has Head of International Affairs at the Mexican Ministry of Environment and Natural Resources where he managed the agenda of over 150 international cooperation instruments, positioning Mexico as champion of sustainable development. He advanced the interests of Mexico in the Paris Climate Agreement, the Sustainable Development Goals, the Convention on Biological Diversity, the G20, and more recently, the environmental component of the United States-Mexico-Canada Agreement (USMCA). He also contributed to raising over 7B US dollars for environmental and biodiversity projects in Mexico and led the establishment of key cooperative initiatives like the Mesoamerican Strategy of Environmental Sustainability (2007), the G20 Green Growth Strategy (2010) and the Carbon Pricing of the Americas (2017). As a consultant he has advised governments, companies and international organization on financing,

climate change, biodiversity, environment, and sustainable development matters, including the economic and financing component of the Mesoamerican Biological Corridor.

Data Analysis and Mapping Specialist

Enrique Muñoz. He holds a BA and Master Degree in Geography from UNAM and has worked in the private sector and as a consultant on environmental topics. As a governmental official, he coordinated the area of GIS for the National System of Biodiversity in Mexico at the National Commission on Biodiversity (CONABIO) during 16 years; from 2012 to 2018, he coordinated the territorial analysis of Biological Corridors at the same institution.
Among this most outstanding achievements are the design and implementation of CONABO Geoportal, and the creation of cartographic guidelines for the projects financed by CONABIO. Enrique is professor at the UNAM and currently works as a consultant. His areas of expertise are SIG, monitoring and evaluation of natural resources, watersheds and participative communitarian cartography.

Economic Growth/Livelihood Specialist

Marcelo Olivera-Villarroel. Ph.D. in Economics specializing in the economics of natural resources by the Faculty of Economics, UNAM, Mexico (2004-2007). Master in Economics with a mention in Public Policy from the Faculty of Economics of the Pontificia Universidad Católica de Chile (2001-2003). He completed his degree in Economics at the Faculty of Economics of the Universidad Mayor de San Simón Cochabamba, Bolivia. He is currently Professor "C" Department of Theory and Design Processes of the Division of Communication Sciences and Design at the UAM, Cuajimalpa Unit. His research interests include Resources and Environmental Economics, Theories of Human Behavior, Climate Change, and Theory of Value. He is a member of LACEEP, of the National System of Researchers - level I (Mexico) and works as an independent consultant for the World Bank and the Economic Commission for Latin America and the Caribbean (ECLAC), among others. He was a visiting professor at the London School of Economics, and at the University of Maryland - UMCES-CBL.

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https://www.biodiversidad.gob.mx/

ANNEX 4. LIST OF INDIVIDUALS CONSULTED

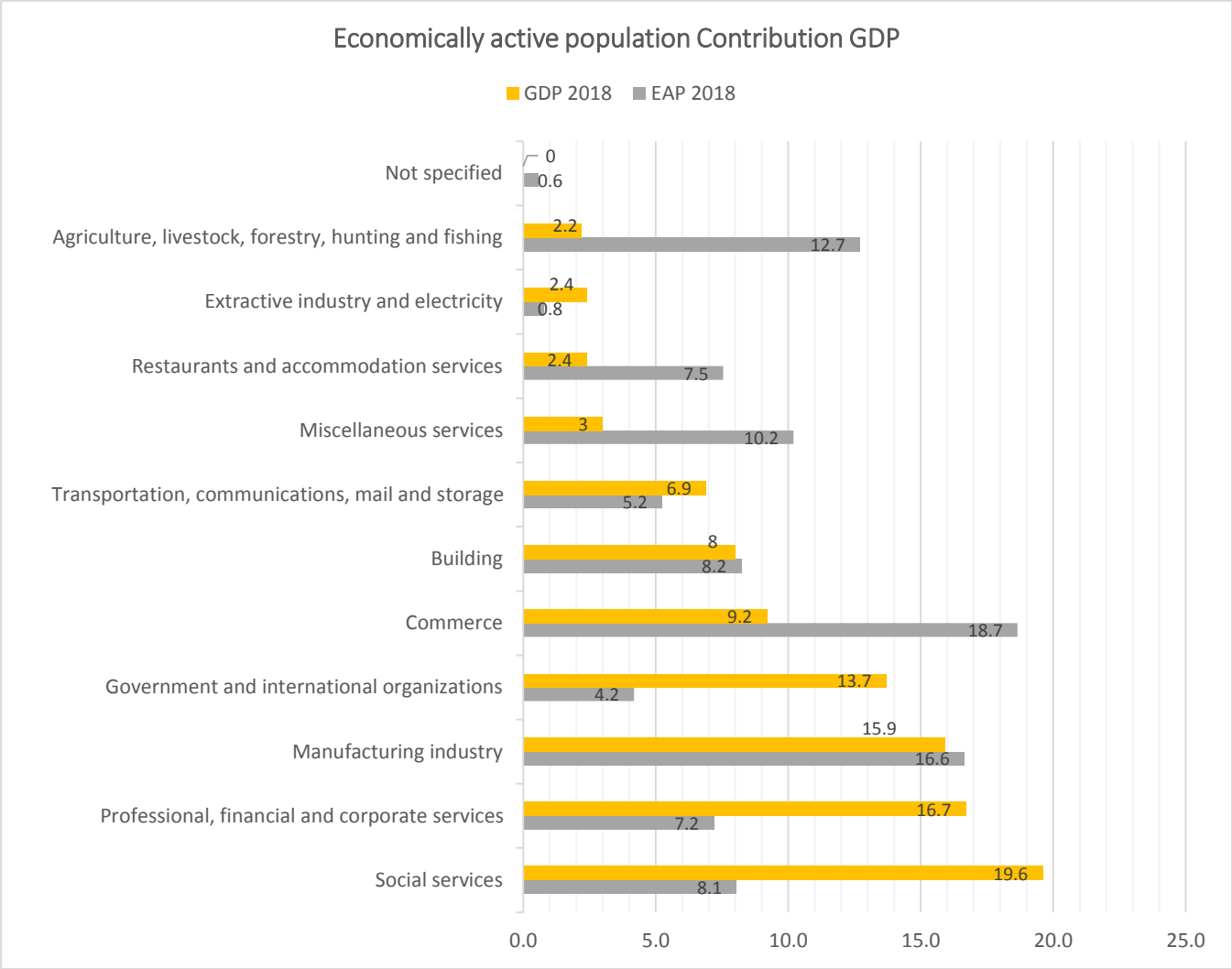
Institution type	Name	Organization
Academia	Laura Juarez González	Colegio de México (COLMEX)
Academia	Jesús Rosales & Producers	CUCSUR - Jalisco
Academia	Unai Markaido, Juan Carlos Avila, Bende Jon, Alayon	Colegio de la Frontera Sur (ECOSUR)
Academia	Sara Burrola Sánchez	CIBNOR Guaymas
Expert	Juan Carlos Perez	COSUR; INEPESCA, SEPESCA, Raul Uribe, cooperativas: Pesca Sur, Empacadura de Pesca Marquez.
Expert	Luis Miguel Argueta	Proyecto de Conservación de la Biodiversidad en el Eje Neovolcánico COBEN
Expert	Seki Cinco	The Nature Conservancy (TNC)
Expert	Juan Bezuary Creel	The Nature Conservancy (TNC)
Expert	Juan Manuel Mauricio	Independent/Consultant
Expert	Rafael Obregón	Natural Protected Areas (NPA) CDMX
Expert	Andrés Ávila Akerberg	Polea
Expert	José Manuel Canto	The Nature Conservancy (TNC)
Expert	Leonardo Corrales and Raúl Molina	Sonora - Estero el Soldado NPA
Foundations/Private sector	Timothée Murillo	Danone Ecosystem Fund
Foundations/Private sector	Ivana Fertziger	Ford Foundation
Foundations/Private sector	César Armenta	Fundación Azteca
Foundations/Private sector	Concepción Molina Islas	Fundación Carlos Slim
Foundations/Private sector	Gisela Noble	Fundación Walmart
Foundations/Private sector	Gustavo Pérez Berlanga	Toks
Foundations/Private Sector	Eduardo Portugal	Asociación de Mineros A. C.
Foundations/Private sector	Kristina Diaz	PROTEAK
Government	Gustavo Camou	Subsecretaría de Ganadería Sonora
Government	Alejandra Aguilar	SEMADET Jalisco
Government	José Sarukhán Kermez	CONABIO
Government	Patricia Koleff	CONABIO
Government	Andrea Cruz	CONABIO
Government	María Francisca José Acevedo Gasman	CONABIO

Institution type	Name	Organization
Government	Jorge Fernández	CONAFOR
Government	Armando Alanís	CONAFOR
Government	Mauricio Mendoza Briseño	CONAFOR
Government	David Gutiérrez-Carbonell	CONANP
Government	Ignacio March	CONANP
Government	Francisco Navarrete and Beatriz Carranza	PROFEPA - Sonora
Government	Amparo Martinez	INECC
Government	Margarita Caso	INECC
Government	Italia García	Delegation SADER Jalisco
Government	Juan Quimbar Acosta	CEDES
Government	Karen Rodriguez	SEMADET Jalisco
Government	Leonardo Corrales Vargas	CEDES
Government	Jesús Rochín	PROAES
Government	Luis Carlos Romo	CEDES
Government	Antonio Jesús Díaz de León Corral	PROFEPA
Government	Rigoberto Palafox	CONAFOR - Sonora
Government	Soledad Ortiz	SADER
Government	José Medel Córdova Pérez	BIENESTAR
Government	Salomón Díaz Mondragón	SEMARNAT
Government	Lucía Madrid	SEMARNAT
Government	Sergio Graf	Minister for Enviroment Jalisco (SEMADET)
Intl. development agencies	Karla Barclay	AFD - Mexico Office
Intl. development agencies	Jasmin Hundorf	GIZ - Mexico Office
Intl. development agencies	Gerrardo Arroyo	PNUD
Intl. development agencies	Daniela Torres	PNUD
Intl. development agencies	Sebastian Proust	PPD- GEF
Intl. development agencies	Khatarina Sinegman	World Bank
NGO	Andrómeda Rivera	Fondo de Conservación El Triunfo (FONCET)
NGO	Alejandro Quintana and Antonio Ordorica	COBIOCOM - Reforestamos México
NGO	Sergio Madrid	Consejo Civil Mexicano para la Silvicultura Sostenible (CCMSS)
NGO	Juan Manuel Labougle and Tatiana Ramos	Conservation International
NGO	José Warman and Martha Caballero	ENDESU

Institution type	Name	Organization
NGO	Juan Manuel Frausto	Fondo Mexicano para la Conservación de la Naturaleza (FMCN)
NGO	Jorge Torre Cosío	COBI
NGO	Ana Gargollo & Alejandra Salazar	PRONATURA México
NGO	Lesly Aldana	Rainforest Alliance
NGO	Ernesto Herrera	Reforestamos México
NGO	Daniel Sánchez	Reforestamos México
NGO	Santiago Machado	Paisaje Biocultural Jalisco Sierra Occidental
NGO	Meredith de la Garza	The Nature Conservancy (TNC)
NGO	Jorge Rickards	World Wildlife Fund (WWF)
Producers	Javier Valenzuela L.	CESAVE
Producers	Daniel Guzmán	Agricultores Unidos del Sur de Jalisco (Agriinnjal)
Producers	Juan Manuel Herrera	Productores Forestal de Calakmul
Producers	Luis Javier Peña Robes	Maple Coffee producers-Farmer-to-Farmer School (EMAC)
Producers	Marisa Candiani & Salvador M. Candiani	Rancho los Fresnos
Producers	Mauricio Gonzalez	UMAS - Cocodrilos
US Government	Indira Villegas	USAID Mexico
US Government	Karla Toledo	USAID Mexico
US Government	Diana Blanco	USAID Mexico
US Government	Rafael Flores	USFS
US Government	Marcelo Norsworthy	USAID DCA

ANNEX 5. MAPS, TABLES, GRAPHICS

Figure 2.1 Economically active population that contribute to the GDP rates



Source: INEGI, 2018

Table 2.1 Areas of the Environmental and Natural Resources Sector with Biodiversity and Forest Attributions

Institution	Attribution/Key Administrative Units and policy areas
Ministry of Environment and Natural Resources (SEMARNAT)	• Serves as head of sector and coordinates policy making and implementation for the entire sector including forest and biodiversity issues • Key administrative units related with forest and biodiversity policy: Direction General of Forest and Soils, Direction General of Wild Life, Direction General of Federal Maritime-Terrestrial Zone, Direction General of the Primary Sector and Natural Resources, Direction General of Environmental Planning and Regional/Sectoral Integration, Direction General of Climate Change

National Forest Commission (CONAFOR)	● Designs and implements the national forest policy ● Key policy areas: sustainable forest management, payment for ecosystem services, reforestation and restoration, wildfire prevention and control, forest inventory.
Natural Protected Areas Commission (CONANP)	● Designs, implements and manages natural protected areas policy ● Key policy areas: design of terrestrial and marine areas for conservation, management of NPA, subsidy programs for restoration, sustainable use and priority species in NPA, monitoring of ecosystems
National Commission for Knowledge and Use of Biodiversity (CONABIO)	● Interministerial commission integrated by the ministries of environment, agriculture and rural development, welfare, economy, education, energy, finance, foreign affairs, health and tourism. ● Key areas: knowledge for decision making, basic and applied research, capacity building, sustainable use through biological corridors, subnational biodiversity strategies and special projects
Federal Attorney for Environmental Protection (PROFEPA)	● Leads environmental and natural resources law enforcement and compliances at the federal level ● Key administrative unit and policy areas: Deputy Attorney for Natural Resources in charge of monitoring and enforcement of regulatory instruments related to forest resources, wild life, NPA, ecological land use planning, environmental impact assessment, marine resources and coastal areas.
National Institute of Ecology and Climate Change (INECC)	● Builds knowledge and capacities for policy making in the areas of environment, ecological preservation and restoration, green growth and climate change. ● Key administrative unit and policy areas: General Coordination for Climate Change Adaptation in charge ecosystems based adaptation, risk and vulnerability policy
National Water Commission (CONAGUA),	● Designs and implements national water policy ● Key policy areas: watershed management, ecosystem services, water for environmental purposes, monitoring and enforcement of standards for discharges in water bodies, and efficiency in agriculture irrigation.
Agency of Security, Energy and Environment fir the oil and gas sectors (ASEA)	● Regulates and supervises industrial safety and environmental protection in the oil and gas sectors ● Land use change, environmental impact, pollution in different media

Source: self-elaboration

Table 2.2 Key NGOs related to tropical forest and biodiversity conservation

Stakeholder	**International NGO** **(E.g. Rainforest Alliance, The Nature Conservancy, WWF, etc.)**
Responsibilities (Goals and influence)	Their ultimate goal is to reduce species extinctions and habitat loss, finding solutions to the most pressing problems and threats for biodiversity and conservation of forests, in order to ensure the provision of environmental services as well as mitigation of GHG emissions. In practical terms, big conservation NGOs: ● Prepare proposals to attract funding and be able to address the problems and threats identified.

	● Manage public donations, government funding for biodiversity and forest conservation and sustainable management. ● Provide technical support and recommendations at a policy level to address threats and problems. ● Support, develop and provide scientific research and science-based tools for sound decision-making. ● Raise public awareness on key issues.
Effectiveness	Larger NGOs have more structured and standardized procedures (organizational strategic planning processes, administrative standards and transparency principles). They have as well the potential to scale up more effectively. Big conservation NGOs have monitoring and evaluation methodologies and are concerned about their planning processes. Examples include TNC's "Conservation by Design", Impact Evaluation used by WWF, evidence-based approaches used by CI, or WCS's "5 Measures Program". These efforts seek to plan, execute and evaluate projects and their effectiveness. Nonetheless, there are challenges for monitoring, evaluation and learning. For example, impact evaluation is costly and hard to do; donors do not prioritize rigorous impact evaluations; smaller projects are decided in the field and not always proceed with the standardized planning process.
Challenges	Fundraising campaigns that reflect popularity rather than science or ecological importance. conservation priorities risk reflecting bias in popular attitudes, rather than the needs of the environment or society, ● Big NGOs usually implement projects working with implementing local partners, which frequently have less structured processes. Transfer of knowledge is an ongoing task to ensure success of interventions in the field. ● Systematization of projects with complete information throughout the project: baseline, implementing costs, identification of collaborators in the field (farmers, communities,), etc. ● The information in the previous bullet is related with the need to strengthen collaborations with the private sector to include market solutions. ● Big NGOs have different agendas in spite that they share the same goals. NGOs rarely present common positions or coordinate for collective action. ● NGOs can strengthen the design of exit strategies to maximize success of the projects.
Institutional overlap	Rather than overlap, NGOs tend to complement the capacities in the government and private sectors. **A key role of NGOs is to act as facilitator of collective processes at a landscape/strategic level or strengthening institutional capacities** for REDD+, monitoring and evaluation, etc.
Collaboration	Big NGO collaborated to promote a common conservation agenda. For example, they did so with collective proposals for presidential candidates and the new government in 2017 (Reforestamos México, CI, and WWF participated), or in 2015 to promote sustainable agriculture and avoid perverse subsidies from the Ministry of Agriculture (SAGARPA) (TNC, CI, CIMMY and IMCO). On the other hand, they partner with the private sector for providing solutions such as the Water Funds coordinated by TNC, or Rainforest Alliance's partnership with Walmart to integrate small holder farmers into value chains.

Source: self-elaboration

Figure 3.1 Map of the North physiographic provinces. Region

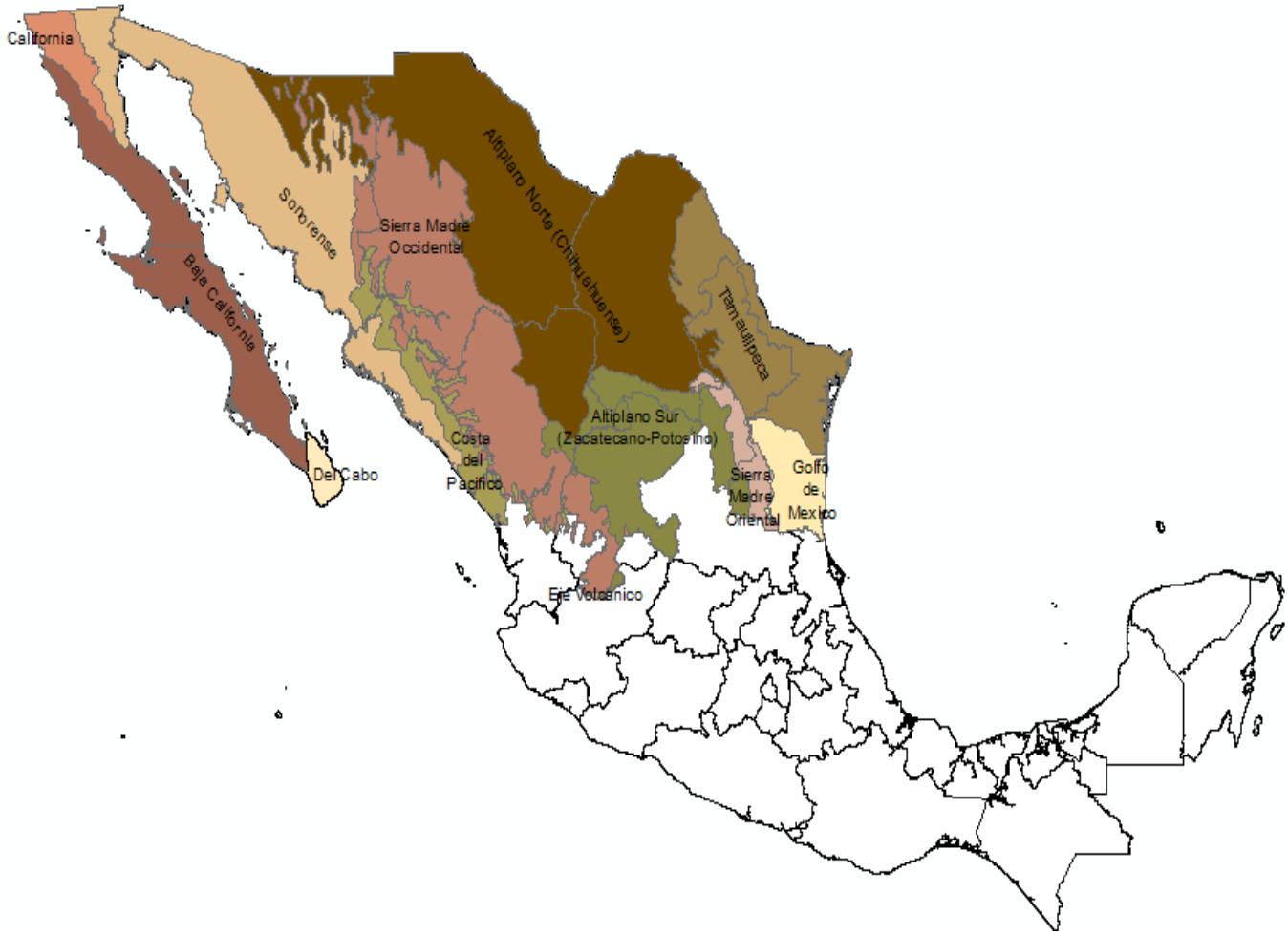


Figure 3.2 Map of the physiographic provinces. Central Region

Figure 3.3 Map of the physiographic provinces. South Region

Table 3.1 Surface of the physiographic provinces of the North, Central and South Regions

Province	Hectares
North Region	
North Highlands (Chihuahuan)	33,803442
Sierra Madre Occidental	19,567354
Sonoran	16,907269
Baja California	9,942666
Tamaulipeca	9,853798
South Highlands (Zacateno Potosino)	9,654316
Pacific Coast	4,177694
Gulf of Mexico	3,073802
Sierra Madre Oriental	1,912889
California	1,776132
Del Cabo	850,740
Volcanic axis	36,908
Central Region	
Volcanic axis	11,639,681
South Highlands (Zacateno Potosino)	10,323809
Pacific Coast	4,978720
Balsas Depression	4,009456
Sierra Madre Oriental	2,291453
Sierra Madre Occidental	1,647148
Gulf of Mexico	1,311712
Sierra Madre del Sur	378,548
Oaxaca	143,616
South Region	
Gulf of Mexico	12,826756
Peten	8,013506
Pacific Coast	7,914737
Sierra Madre del Sur	5,291329

Yucatan	5,199235
Balsas Depression	2,425314
Oaxaca	893,706
Soconusco	885,474
Sierra Madre Oriental	362,006
Eje Volcanico	355,791

Table 3.2 Biological groups present in the North Region, species status and risk categories

GROUP	NORTH													
	Wealth	Endemic	NOM-059				CITES				IUCN			
			P	A	PR	TOTAL	AP-I	AP-II	AP-III	TOTAL	CR	EN	VU	TOTAL
Amphibians	116	54	1	10	37	48	0	1	0	1	2	10	14	26
Reptiles	656	219	15	115	162	292	13	23	2	38	6	19	24	49
Fish	1685	3	44	52	17	113	2	19	0	21	17	21	65	103
Birds	895	64	46	55	88	189	15	113	8	136	4	13	21	38
Mammals	360	79	18	27	39	84	19	27	5	51	4	14	11	29
CENTER														
Amphibians	173	115	5	18	70	93	0	3	0	3	29	29	23	81
Reptiles	554	241	11	80	168	259	7	14	4	25	5	16	25	46
Fish	903	1	28	37	13	78	2	10	0	12	13	13	23	49
Birds	834	81	39	61	87	187	10	126	8	144	2	8	14	24
Mammals	328	86	14	24	30	68	9	15	10	34	5	14	11	30
SOUTH														
Amphibians	289	186	4	32	101	137	0	2	0	2	71	62	36	169
Reptiles	676	288	16	102	219	337	7	33	5	45	5	19	31	55
Fish	1622	2	17	26	21	64	2	15	0	17	11	17	47	75
Birds	996	85	57	107	123	287	14	147	11	172	3	11	24	38
Mammals	367	83	18	42	45	105	12	17	12	41	15	20	16	51

Status and categories of risk:

- NOM 059: (P) in danger of extinction; (A) Threatened; (Pr) Subject to special protection.
- CITES: (AP-I) Species at higher risk; (AP-II) Species that are not necessarily threatened but can be if commerce is not controlled; (AP-III) Species included to avoid their unsustainable or illegal exploitation.
- IUCN: (CR) Critical danger; (EN) endangered; (VU) vulnerable.

Table 3.3. Main changes between the use of soil and vegetation of the periods 2006-2016 for North, Center and South Regions

North Region							
	Serie III (2001)	Serie VI (2014)	Difference	Velázquez et al. 2002			
	ha	ha	ha	SVI/SIII	1/years (13)		Rate
Primary Vegetation	79,027,404.73	76,349,550.20	2,677,854.53	0.97	0.08	1.00	-0.26
Secondary Vegetation	14,298,810.84	15,179,676.66	-880,865.82	1.06	0.08	1.00	0.46
Land use	18,241,751.06	19,989,531.50	-1,747,780.44	1.10	0.08	1.01	0.71
Water	448,401.06	492,606.84	-44,205.78	1.10	0.08	1.01	0.73
Center Region							
Primary Vegetation	11,045,154.74	10,302,916.80	742,237.95	0.93	0.08	0.99	-0.53
Secondary Vegetation	9,617,412.36	10,138,817.29	-521,404.93	1.05	0.08	1.00	0.41
Land use	15,786,308.33	15,954,487.51	-168,179.19	1.01	0.08	1.00	0.08
Water	322,284.73	370,467.07	-48,182.34	1.15	0.08	1.01	1.08
South Region							
Primary Vegetation	9,871,882.03	8,797,800.15	1,074,081.89	0.89	0.08	0.99	-0.88
Secondary Vegetation	18,440,942.84	18,164,279.80	276,663.04	0.98	0.08	1.00	-0.12
Land use	17,441,851.49	18,761,924.66	-1,320,073.16	1.08	0.08	1.01	0.56
Water	374,312.97	396,414.95	-22,101.97	1.06	0.08	1.00	0.44

Figure 3.4 Map of gain and loss in vegetation. North Region

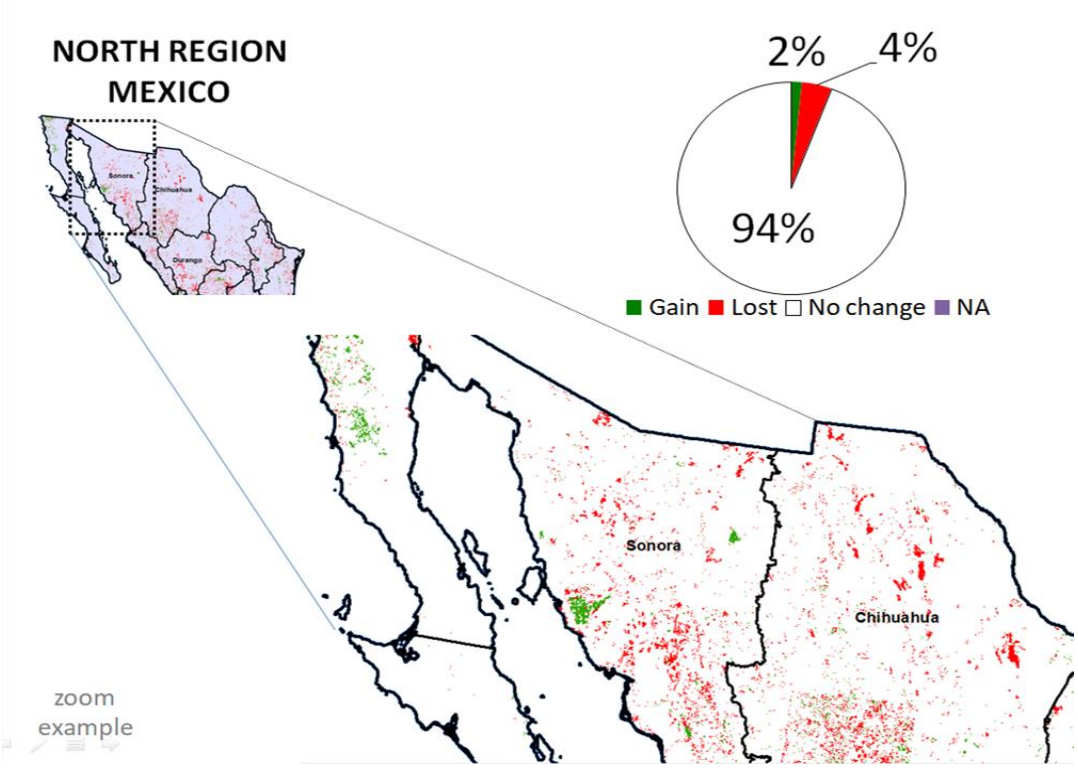


Figure 3.5 Map of gain and loss of vegetation the Central Region

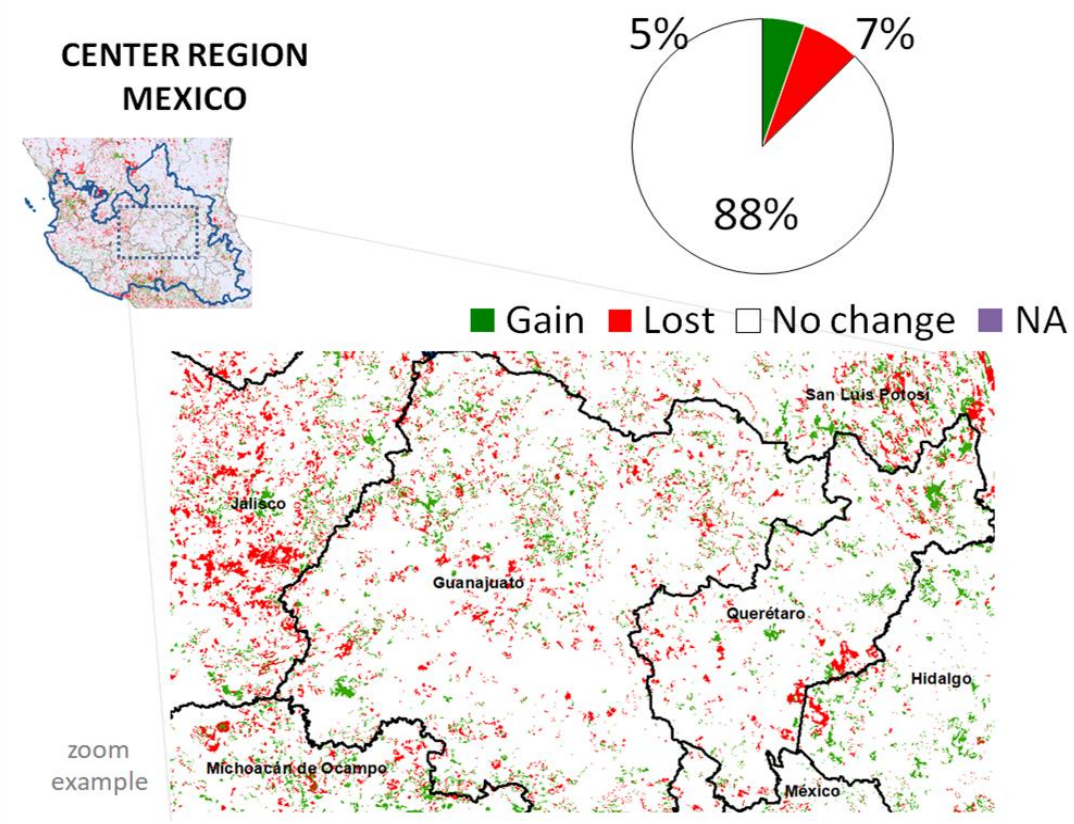


Figure 3.6 Map of land use changes for the South Region

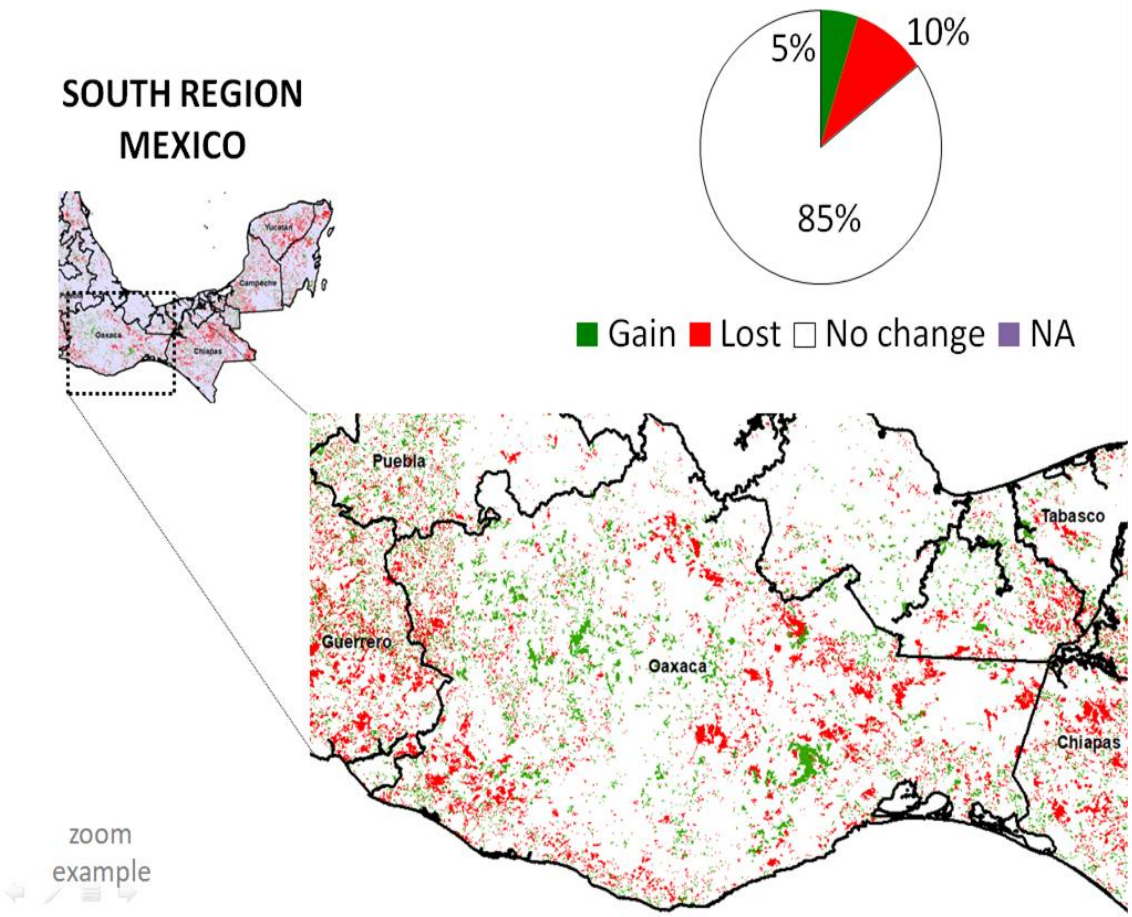
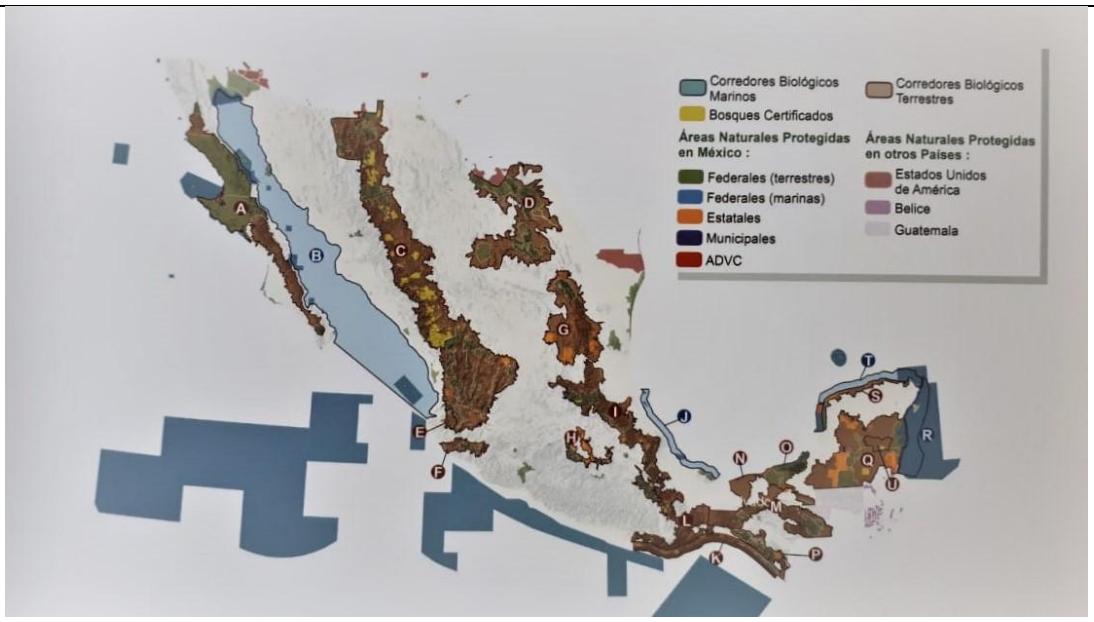


Table 5.1 Surface of Ecoregion Within NPA

Ecoregions of Mexico	Surface of Ecoregion Within NPA (ha)	% of Surface of Ecoregion covered by NPA
Mexican upland	25,920.75	0.4
Water bodies	51,707.19	16.8
Coastal plains and dry hills from the Gulf of Mexico	87,660.12	1.9
Coastal plains and hills of the southern pacific	116,364.49	2.1
Mountain range and plains of El Cabo	126,534.43	15.6
Tuxtlas Mountain Range	153,291.70	44.5
Northwestern plains of the Yucatan Peninsula	200,244.82	16.3
Soconusco coastal plains and hills	209,085.28	18.7
Mediterranean California	228,264.34	9
Western plains and hills	252,403.62	21.7
Texas-Louisiana coastal plains	272,131.25	18.2
Tamaulipas-Texas semiarid plains	364,337.13	3.9
Central American Sierra Madre and Chiapas Heights	399.738.96	14.3
Southern Sierra Madre	465,497.43	4.9
Piedmont of Western Sierra Madre	475,658.92	2.9
Western coastal plains, hills and canyons	505,676.25	4.7
Intermontane depressions	721,698.26	8.1
Transversal noevolcanic system	751,161.75	9.1
Eastern Sierra Madre	1,115,710.31	21.5
Gulf of Mexico coastal plains and wet hills	1,209,339.40	9.3
Plains and hills of the Yucatan Peninsula	1,425.326.47	11.9
Western Sierra Madre	2,420,961.11	13.8
Warm deserts	8,533,914.48	15.3

Source: CONANP, 2018

Figure 5.1: Biological Corridors in Mexico



	Identification	Name
	A	Baja California Desert Corridor
	B	Marine Corridor of the Golf of California
	C	Grand Corridor of the Western Mountain Range
	D	Chihuahua Desert Corridor
	E	Ameca Lanscape (preliminary proposal)
	F	Manatitlan Chamela Corridor
	G	Northern Corridor of the Eastern Mountain Range
	H	Neovolcanic Axel Biological Corridor
	I	Sothern Corridor of the Western Mountain Range
	J	Marine Corridor of Veracruz Reef
Mesoamerican-Mexico Biological Corridor	K	Coastal Corridor of the Pacific Wetlands
	L	Oaxaca Corridor
	M	Lacandona-Zoque Tropical Forest Corridor
	N	Coastal Wetlands- Huaimanguillo Mauntain Range
	O	Usumacinta River Corridor
	Q	Chiapas Mountain Range Corridor
	R	Maya Rain Forest Corridor

	S	Marine Corridor of Yucatan Northern Coast
	T	Terrestrial Corridor of Yucatan Northern Coast
	U	Bala´an K´aax-Sian Ka ’an Corridor
	R	Marine Corridor of the Caribbean

Source: CONANP, 2018

Figure 5.2 Location of sea turtle nesting beaches and camps

Table 5.2: Coverage of NPA with respect to marine ecoregions in Mexico

Ecoregions of Mexico	Surface of Ecoregion Within NPA (ha)	% of Surface of Ecoregion covered by NPA
Magdalena transition	56,136.25	0.32
Northern Gulf of Mexico	1.104.968.73	1.85
Chiapas-Nicaragua	6,665,580.88	19.74
Mexican tropical pacific	19,115,935.14	29.11
Sothern California Ensenada	405,694.23	2.53

Western Caribbean	6,072,946.96	24.81
Revillagigedo	32,754,955.51	51.4
Sothern Gulf of Mexico	788,956.57	1.07
Sea of Cortez	2,289,816	8.81

Source: CONANP, 2018

Table 5.3 Main Laws Related to Biodiversity and Forest in Mexico

Law	Principles and Provisions related to Biodiversity/Forest
Mexican Constitution (1917, environmental reforms 1987, 1999)	Establishes the right of all people to a healthy environment and the State´s right and obligation to regulate natural resources.
General Law of Ecological Balance and Environmental Protection (1988, last reform 2018)	Sets the general framework for protection and sustainable use of environment and natural resources. Defines attributions for different levels of government and key instruments for conservation/protection of biodiversity and ecosystems including: NPA, environmental impact assessment, ecological land use planning and pollution.
Federal Law of Environmental Responsibility (2013)	Defines responsibility, redress and compensation criteria for damage to the environment and ecosystems.
General Law for the Prevention and Integrated Management of Waste (2003, last reform 2018)	Sets principles and procedures for the management of waste from different sources and different media.
General Law of Wildlife (2000, reformed 2018)	Principles and procedures for the conservation and sustainable use of wildlife and its habitat (excluding forest, marine species and endanger species).
General Law of Sustainable Fisheries and Aquaculture (2007, last reform 2018)	Defines principles and procedures to manage, promote and regulate sustainable use of fisheries and aquaculture considering social, technological, productive, biological and environmental criteria.
General Law of Sustainable Forest Development (2018)	Fosters sustainable forest management based on ecosystems and integrated territorial management approach. Mandates compatibility between productive activities and forests, including coordination of agricultural subsidies and policies with potential impact on deforestation and forest degradation.
National Water Law (1992, last reform 2016)	Sets principles and procedures for sustainable management of national waters including environmental use. Defines attributions and responsibilities for CAN and different actors including watershed governance bodies.
Law of Biosafety and Genetically Modified Organisms (2005)	Principles and procedures for use, trade and research of GMOs to avoid and prevent risk to human health, environment and biodiversity,

Law of Sustainable Rural Development (2001, last reform 2019)	Fosters welfare improvement of rural communities, enhances sustainable use of natural resources, and promotes valuation of environmental services and sustainable agricultural practices such as agroforestry.
General Law of Climate Change (2012, last reform 20118)	Principles and procedures for climate change mitigation and adaptation including carbon sequestration in forests, impact of climate change on biodiversity and ecosystems based adaptation
Federal Law of the Sea (1985)	Principles, procedures and attributions for management of the sea and its resources under national jurisdiction, including its conservation and sustainable use.
Agrarian Law (1992, last reform 2018)	Promotes development of the rural sector through productive activities and social actions based, among others, on the rational use and conservation of natural resources to preserve ecological balance. Sets the basic rules for ejido land tenure and management.
General Law of Vegetal Health (1994, last reform 2017)	Includes provisions on species and genetic diversity relevant for biodiversity conservation
General Law of Animal Health (2007, last reform 2018)	Includes provisions on species and genetic diversity relevant for biodiversity conservation
Law of Organic Products (2006)	Promotes and regulates criteria and requirements for the production, processing stocking, identification, labeling, transport, verification and certification of organic products.
Law for the Promotion and Development of Bioenergetics (2008)	Fosters the production of energy products based on agriculture, forest, algae, biotechnology, and agriculture enzymes.
General Law of National Goods (2004, last reform 2018)	Defines the criteria to manage and use national goods including natural resources and ecosystems in public land.

Source: self-elaboration based on USAID 2013 and CONABIO, 2016.

Table 5.4 Main International Instruments signed by Mexico related with Biodiversity and Forest Issues

Law	Objectives/instruments
Convention on Biological Diversity (CBD), 1992	Conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
Cartagena Protocol on Biosafety of the CBD, 2000	Regulates the movements of living modified organisms (LMOs) resulting from modern biotechnology from one country to another
Nagoya Protocol to the CBD, 2010	Fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies.

Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety, 2012	Contribute to the conservation and sustainable use of biodiversity by providing international rules and procedures in the field of liability and redress relating to living modified organisms
Convention of International Trade of Endangered Species of Wild Fauna and Flora (CITES), 1973	Aims at ensuring that international trade in specimens of wild animals and plants does not threaten their survival.
International Convention for the Regulation of Whaling, 1946	Provides for the protection of certain whale species; designate specified areas as whale sanctuaries; set limits on the numbers and size of whales which may be taken; prescribe open and closed seasons and areas for whaling; and prohibit the capture of suckling calves and female whales accompanied by calves.
Convention of Wetlands of International Importance especially as Waterfowl Habitat, 1971	Aims at the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world
International Plant Protection Convention, 1951	Aims to secure coordinated, effective action to prevent and to control the introduction and spread of pests of plants and plant products.
Inter-American Convention for the Protection and Conservation of Sea Turtles, 2001	Protection, conservation and recovery of sea turtle populations and their habitats, considering environmental, socioeconomic and cultural criteria.
United Nations Agenda 2030 and Sustainable Development Goals (SDGs), 2015	Sets the international framework to achieve Sustainable Development through concrete goals and targets. Many of the SDGs are relevant for biodiversity and forest: 15-Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss; 14-Conserve and sustainably use the oceans, seas and marine resources for sustainable development; 13-Take urgent action to combat climate change and its impacts; and 12-Ensure sustainable consumption and production patterns.
United Nations Framework Convention on Climate Change, 1992; The Kyoto Protocol, 1997; the Paris Agreement, 2015	Stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, internationally binding emission reduction targets and national determined contributions (NDCs) for mitigation and adaptation. Forest, land use change and reduction of emissions for deforestation and forest degradation (REDD) are important elements for the implementation of the Convention and related instruments.
United Nations Convention to Combat Desertification, 1994	Combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or decertification, particularly in Africa. Improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources.

Convention Concerning the Protection of World Cultural and Natural Heritage, 1972	Ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage situated on its territory. A number of the Natural Protected Areas in Mexico are registered under the principles and guidelines of this Convention.
United Nations Convention on the Law of the Sea, 1982	Defines the rights and responsibilities of nations with respect to their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources.
Convention for the Conservation and Development of the Marine Media of the Great Caribbean Region, 1983	Protection of the marine environment through actions to address pollution from different sources

Source: self-elaboration

Table 5.5 Biodiversity and Forest Goals in national Development Plans (PND)

Administration Period	Chapter/Axel within the PND	Goals
2019-2024	Social Policy	*Sustainable Development:* ● Consider the impact of policies and programs in the social safety net, ecology and ecological and political horizons of the country ● Foster economic growth without affecting peace, solidarity, cultural diversity and environment *Sembrando Vida:* ● Subsidy to low income rural land tenors in 20 states to plant fruit and timber trees in an area of 2.5 hectares per beneficiary with the aim of reaching a total surface of one million hectares
2013-2018	Economic (Prosperous Mexico)	*Protect the Natural Patrimony*: ● Conservation, restoration and management of natural capital ● Sustainable management of timber and non-timber forest products ● Consumption of environmental goods and services ● Build capacities of *ejido* and communities in forest and highly biodiverse zones ● Increase the surface under conservation through best practices and regulation ● Streamline the programs of biodiversity conservation and sustainable management for the benefit of low income communities ● Improve reforestation, tackle wildfires and recover damaged ecosystems
		Halt forest degradation: ● Restoration of forest through ecosystems conservation, ● Sustainable management of forest

2007-2012	Environmental Sustainability	● Payment of ecosystem services to communities who protect and preserve the forest ● Analysis, prevention and control of wildfires ● Halt the progress of the agricultural frontier in forest areas *Preserve Biodiversity and Ecosystems*: ● Build knowledge and foster awareness of biodiversity ● Increase surface under conservation and sustainable management ● Prioritize Mexican endanger species *Mainstream natural capital conservation into economic and social development:* ● Improve the use clean technologies in productive sectors ● Foster ecotourism as a tool for conservation and rural development ● Harness sustainable management of resources in rural productive projects
2001-2006	Social and Human Development	*Achieve social and human development in harmony with nature*: ● Harmonize population growth and distribution with sustainable development ● Foster ecological culture to mainstream environmental protection in decision making at all levels and by all sectors ● Enhance scientific and technical development of ecological processes ● Foster sustainable production and consumption processes ● Reach protection and conservation of biodiversity and representative ecosystems ● Halt and revert erosion processes and increase reforestation

Source: Self-elaboration

Table 5.6 National Strategies Related with Biodiversity and Forest in Mexico

Strategy	Main Objectives related with Biodiversity and Forest
National Strategy of Invasive Species; 2010	Includes 5 components: legal framework, capacity building, sectorial coordination, awareness rising and knowledge for decision making.
Climate Change Strategy for Natural Protected Areas, 2014	Build adaptation capacity of ecosystems and population living in them against climate change, mitigate emissions and enhance carbon capture and storage.
National Strategy for the Sustainable Management of Soils, 2010	Sustainable management of soils in all country´s ecosystems by coordination of programs, actions and actors at the three levels of government
National Strategy for the Conservation and Sustainable Development of Islands, 2012	Articulation of 4 crosscutting policy components in islands: knowledge, public policies, inter-institutional coordination and financing
Mexican Strategy for Plant Conservation 2012-2030	Establishes a roadmap for knowledge building and systematization, conservation and sustainable use of plan diversity in Mexico. It has a

	2030 vision and sets 6 objectives with lines of action, actors, targets and timelines for implementation.
National Climate Change Strategy, Vision 10-20-40, 2013	Among its objectives, it includes conservation of ecosystems and environmental services as well as best practices in the agriculture and forest sectors to reduce emissions and increase carbon sinks.
National Wetlands Policy, 2014	Establishes the basis and priorities for articulation of federal government actions and coordination with other levels of government, the private and society in the conservation of wetlands.
Strategy towards 2040 for the Conservation of natural Protected Areas in Mexico, 2014	Articulation, harmonization and alignment of instruments and tools for the conservation and sustainable use of biodiversity within NPA in a dynamic environment.
National Biodiversity Strategy of Mexico 2016-2030	Sets the framework for conservation and sustainable use of biodiversity with a 2030 vision through knowledge building, conservation-restoration, sustainable management, tackling pressure drivers, education-communication-culture, governance-integration
National Strategy for the Reduction of Emissions of Deforestation and Forest Degradation (ENAREDD+),	With a 2030 vision, establishes a mechanism for sustainable landscape/forest management to promote mitigation, adaptation and sustainable rural development.

Source: self-elaboration based on CONABIO, 2016

Figure 5.3: Case study Size of farms in silvopastoril systems

Figures 5.3.a, 5.3.b and 5.3.c show that small owners or small farmers who work plots of 10 hectares on average devote 80% of the area to pasture and 20% to crops; medium-sized farms with 50 hectares on average have pasture on 80% of the area, silvopastoral systems on 16% and crops (usually maize) on the remaining 4%. Large farms with 800 hectares on average have silvopastoral systems on 50% of the land, use 38% of the area for pasture and the remainder for crops.

Figure 5.3.a

Figure 5.3.b

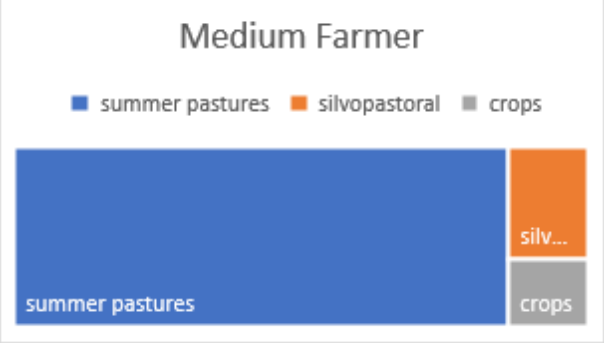


Figure 5.3. c

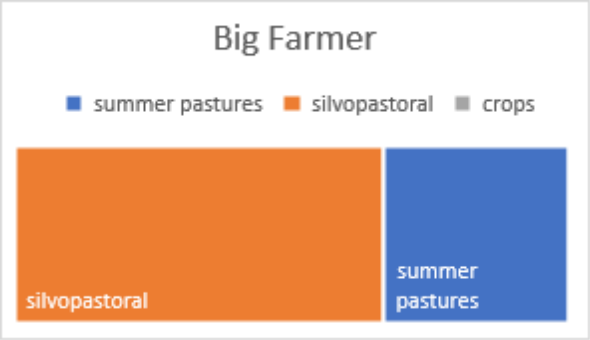

Big Farmer
summer pastures
silvopastoral
crops
silvopastoral
summer pastures

Table 5.7: Key value chains/productive activities with positive impact for biodiversity and forest conservation

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Agroforestry (milpa system)	Monoculture • **Productivity**. Low production, low availability of forage at certain times of the year, under self-consumption insurance, low added value, high fuel consumption. • **Stability, resilience and reliability.** Monoculture, decreasing	2.32	Milpa System • **Polyculture** of beans, squash and maize, among others, which meant a more diversified production of food and, at the same time, less wear of nutrients in the soil. The milpa system is considered a viable alternative that combines ingenious peasant and indigenous practices that integrate products for the diversification of the diet. • It has greater benefits for the production of food, meets the expectations of food security with respect to corn and legumes, takes better advantage of local natural resources, generates work for peasant families, is low	• Problems of competitive offer of food and raw materials for the national economy and for export. • Dependence on external inputs, use hybrid seeds, application of extreme fertilizers, use of dangerous herbicides and insecticides, use of not quality technology, machinery and	These actions have different implications: technical training, capital investment that the State can finance with soft loans and facilitation to introduce the first harvests to the mercantile chains. Improve and disseminate sustainable production techniques.	6 months

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	interest towards agriculture by new generations, degraded natural resources. • **Adaptability.** Low corn prices, unpredictable climatological aspects (frost, drought); high cost of external inputs (agricultural inputs and fuels). • **Equity.** Low profitability, limited supply of grains, hoarding by intermediaries (coyotes). • **Self-dependence (self-management).** High dependence on external inputs, much		entropy and is friendly to the environment. • Peasants and indigenous people need to integrate other elements that make their production systems more economically profitable and, in general, more sustainable. One of these may be the introduction of fruit trees of good quality, with acceptance in the market.	equipment. • Think about the links between the peasant economy and the capitalist economy as an intercultural relationship, proposing the arguable assumption that the traditional is obsolete or archaic and needs to be transformed or changed to a modern consumption.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	labor required, lack of well-paid employment and high migration. • **Environment.** High rates of soil erosion and deterioration, high contamination due to the use of agrotoxins, high dependence on external inputs, higher prices of inputs and fuels, ecological imbalance and the consequent incidence of insects and diseases, risk of genetic erosion of native seeds, and so on.					

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Beekeeping production	Some specific problems include the lack of adoption of current technologies according to the requirements of market safety; the forms of commercialization, mainly towards the outside, where only exporters participate with an intermediary scheme. The producers observe the fundamental principles of the company, since the production they obtain is marketed in markets that do not agree with the logic of the family production units. Climate change which in turn has caused changes in temperature, rainfall and modification of	0.65	**Add value to the products of the hive.** This provides another alternative for commercialization, since through the industrialization of primary products various final products are obtained, among which are the adjuvants in the treatment of some respiratory diseases, food supplements, sweets, cosmetics, among others, that are aimed at satisfying the demand of internal consumers and, with the appropriate channels, that of the external ones. The added value would increase the profits and, consequently, the entire productive and commercial chain would be dynamized. **Adequate integration to marketing channels.** This would favor the direct relationship with the main buyers of other links in the productive or commercial chain (agroindustrial, marketers and distributors) and, as a consequence, would allow to obtain better prices and income by	The lack of adequate and updated federal legislation that effectively regulates the activity, the disengagement and ineffectiveness of the various producer organizations, the few direct marketing channels between the producer and the consumer.	Strategic planning is required that leads to take advantage of the opportunities offered by the markets and consider the threats of external and environmental factors, which can favor the growth of activity and improve the income level obtained by families in rural sector.	18 months

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	seasons, which negatively affects the production. Deforestation, which has decreased the availability of nectar-pollen vegetation, which has affected the livelihood of bees and, consequently, production volumes per apiary. The process of Africanization, the presence of the varroa mite and diseases. Use of agrochemicals, new pests with slow sanitary control, null genetic improvement. Increase in the price of inputs. Variation of sale prices due to economic phenomena. Extraction of honey outdoors.		eliminating the participation of unnecessary commercial agents. Beekeeping can be considered as an opportunity to business as long as the profitability is guaranteed looking for alternatives that allow to increase the income by means of the increase of the current productivity and defining better strategies of commercialization.			

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	Credits with high interest rates.					

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Organic cocoa production	• High costs of agrochemicals, equipment and agricultural machinery, outside the budget of the producers. • Strong drought in flowering season, and lack of infrastructure (irrigation systems). • Abundant and prolonged rainfall in ripening and harvest dates. • Theft of fruit at harvest time. • High presence of robbery, armed robbery, kidnapping and assassination in the communities. • Increasing increase in the price of fuels, so there is a shortage of equipment to transport the product. • Problems in the supply of electric	1.42	• Develop permanent parcels management programs through technical assistance (use of technologies to be applied in the crop, depending on each particular case) in order to increase the harvest volume (productivity and profitability). • Promote sustainable crop techniques. • Promote the practice of detailed recording of production costs. • Organization for the purchase in volume of supplies, equipment and agricultural machinery. • Promote a greater and better use of information and communication technologies. • Take advantage of government support opportunities to land some projects of particular interest and / or small producer groups. • Encourage the production of plants through community nurseries for the renewal of their plots with plants for replanting their plots, training and in-kind support for the production of quality seedlings for grafting.	The great problem of the Mexican cocoa industry is directly with the producer and the insufficient supply of the product, generated from the tariff incongruity, which reduces the competitiveness of the companies. Technical, commercial and financial feasibility study to determine which agro-industrial activities can be developed in the state. High cost of intermediation. Lack of advice and marketing strategies. Lack of financing.	• Promote the rescue of cocoa of origin. • Establish participatory nurseries. • Promote the organic certification process.	30 years

	power and communications.		• Acquisition of suitable equipment for the processing of the cocoa bean. • It is recommended, on the other hand also the realization of permanent mass campaigns in the localities for the promotion of values, both in public media, as in important points, such as schools, work centers, in order to promote the reduction of censurable activities, such as theft, breach of offers, etc., seeking to establish more harmonious practices of respect and coexistence in the communities, which can be achieved with permanent and long-term programs. • Diversify the crop interspersing timber or fruit species, and even corn, plantain and vegetables, in order to optimize the profitability of the plots.	Disintegration of the links in the chain.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Organic coffee Production	Claims of the earth excessive amounts of a few nutrients, which this is not able to give. This, added to the limited contributions of humus that a scarce and one-dimensional vegetation can offer, leads to an impoverishment of the soil, and encourages a greater use of artificial fertilizers. It entails a greater application of toxic substances for the control of pests, which were previously largely controlled by biodiversity. Requires large investments in chemical herbicides, to eliminate plant forms that rival the cultivated species. Supposes	1.148	• Reduces pollution of the environment • Seeks to eradicate phytosanitary problems of farms by natural means • Increases the biological fertility of the soil. • Reduces production costs by external inputs to eliminate the use of synthetic agrochemicals (pesticides, fungicides, herbicides) • Increase the development of good agricultural practices in what concerns the use and conservation of soil and water. • Presence of traditional	Coffee plantations now face a higher incidence of diseases, serious decline in yield, which leads to an increase in the inputs of the crop, low profitability and large fluctuations in the international price. The consequence of the devastation caused by pests and diseases is that thousands of rural families that have depended for decades on this product now face the risk of food security.	Producing organic coffee is profitable for producers committed to nature and capable of investing for the future, not for producers who lack savings and commitment. Producers who organize can produce roasted and ground organic or conventional coffee that offers the highest yields in the market. It is necessary for producers to commit to their crops to produce quality coffee at the level of new consumers capable of paying an over-price if the product is worth it. Producers who, due to the characteristics of the soil, can keep their crops away from sowings contaminated with agrochemicals and protected with natural forests must opt for organic plantations that are sustainable with nature. Producers who have natural fertilizers and protect the biodiversity, can receive better prices for their crops. Producers should try to actively integrate into the	36 months

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	infrastructure works to inform the conditions of the crop (for example, to drain the too wet lands or to irrigate the very dry ones). Eliminates the habitat of hundreds of species, animals and plants, which are forced to migrate. Deprive the soil of a large fraction of the vegetation layer, exposing it to water erosion.		agricultural practices, such as the association and rotation of crops, incorporation of organic materials, terraces, etc. • Important presence of indigenous knowledge and traditions, worldview of respect for land, water and plants. • Minimum or no use of agrochemicals of most producers. • Strong roots of traditional forms of organization, according to uses and customs of the indigenous groups, respect of the peoples and communities to their traditional authorities, and rooted in the group. • Abundant workforce.		value chain in the quest to offer their product directly to the customer with higher profit margins	

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
			• Conditions of coffee production, mostly in the mountains and "under shade", of ecological importance, since the coffee production areas of Mexico are important oxygen generators, which makes them susceptible to be supported by environmental organizations. • There are chapters for Mexico of the main certifiers of organic products. • There is also in the market the supply of machinery and equipment appropriate to the requirements of organic production. • Mexico's free trade agreements with the main markets of the world,			

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
			national and local.			

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Sustainable forestry management (Wood) *Pinus patula*	Insecurity in land tenure, deficiencies in the organization and management of forest owners, over-exploitation of forest resources, clandestine logging and the negative trade balance suffered by the forestry sector and the country. (PROFEPA) accepts that the consumption of illegal industrial wood in the country is 5-7 million cubic meters per year, which represents approximately 80% of the total production	2.32	· Apply intensive silviculture based on the potential of the species subject to forest harvesting, with a vision to reduce harvest periods, increase production and product quality per unit area, with better forest management techniques, such as the application of treatments forestry, such as: pruning, pre-thinning, thinning. · Promote and implement in practice the application of better harvest techniques of timber raw material, through the use of technology, methods and studies of work, which increase production and productivity, minimizing the impacts on the environment, and increasing economic benefits to support the best quality of life for forest owners and forest regions in general. · Continuous training and training for operational personnel in	· Geographic location; ecosystems, availability, and variability of forest resources · Structure, composition, and forest management of the forest · Forest planning · The system of supply to be used, and the variability of the forest raw material · Road infrastructure, types, maintenance, and physical condition. ·Availability of skilled labor throughout the production process and its organization · Physical-mechanical state of the equipment and machinery available; quantity and modernization · Type, physical-mechanical state of forest transport · The location, type and capacity, levels of vertical and	Inadequate institutional and legal framework to promote sustainable forest management, lack of administrative continuity and forest policy, high production costs, in others.	30 years

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	and it is justified that the main reason for illegal logging is due to the fact that there is no strong economic motivation in all the participants of the forest production chain, both in the producers, merchants, industrialists, authorities and governments; in the absence of effective control of forestry operations, as well as lack of human, financial and training resources.		forestry operations, namely: demolition, sizing, loading, loading and transport of timber forest products derived from the forest. · Strengthening the organization and operation of Forestry Social Enterprises and promoting forestry culture towards the conservation of forests.	horizontal integration of the forest industry · Education and training institutions, and their level of participation with the forestry sector operating · Level of participation of governments and institutions in the productive part of the sector · The integration and operational dynamics of the regulatory institutions for forest management · Availability and access to credits and financing for forest production · Awareness and acculturation of civil society in general, among others.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Extensive sustainable livestock (meat)	Extensive livestock has represented the degradation of soils, the reduction of biodiversity, in short, the loss of environmental quality and vegetation without generating social welfare. The wear of the vegetation cover of large areas of land to convert them to pastures, causing the loss of biodiversity and ecosystems; It is also recognized that this productive activity has contributed to the deterioration of	1.8	It is required a new system that integrates the scale of territory: the production of inputs for livestock feed (grains, by-products, additives, etc.), the production of fodder and animal production, this includes all the species of livestock that they may be driving in the territory (birds, cattle, pigs, etc.). Only use suitable land for grazing, that is, flat and undulating floors with little slope, avoiding the slopes. An adequate grazing regime of the vegetation is important to maintain the forage base and permanent paddocks that do not need to be periodically re-vegetated. Agroforestry is an alternative to improve the sustainability of livestock. The biodiversity in the ranches can be increased with the management of more forage species (herbaceous, shrub,	**Not fair market.** The products must be marketed at fair prices, for that the organization of the producers is indispensable, because the conditions and means for commercialization must be sought. It is **a mistake to think only in national and international markets**; It is increasingly recognized that local and regional markets must be created again. The **profit margins that are generated along the chain are not proportional** and the producers turn out to be the most disadvantaged, so that the distribution of wealth is unequal. High production costs and low prices on	The economic sustainability of the livestock activity is a matter of concern and discussion, because to be truly sustainable, the ranches must be efficient, the wealth they generate must be distributed in all the links of the production chain (equity) and operate under the assumption that the resource base does not have a price and that these must be preserved. Credits to farmers, this will allow the donation to finance the transition to sustainable livestock.	24 months

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	air quality, water and soil. Some current problems related to this deterioration are the deposition of large quantities of organic waste that are generated on farms and discharged into the environment, the excessive use of nutrients that are lost from production systems and end up contaminated water sources and soils, the emissions of methane (CH4), ammonium (NH4 +) and nitrous oxide (N2O), greenhouse gases from the digestion of livestock and		arboreal, legume and non-legumes) and more vegetation associated with grasses with different purposes (fodder, timber, food, delimitation of paddocks, shade, improvement of floors, etc.).	their products. Greater regulation in the livestock activity, to plan the location of ranches and farms, so that they do not come into conflict with society and have more opportunity to treat and dispose of waste; this regulation would also have to address the treatment of emissions, as has already been discussed before. • Bad production practices and high dependence on chemical products. • The ground is very damaged. • The abandonment of the land is widespread. • Shortage of labor. • Greater number of pests. • Small producers with properties of less than five hectares require improvements in their production		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	the application of organic and inorganic fertilizers in the soil. The soil has been used as an inert substrate, especially soils for livestock that have endured agronomic and livestock practices such as tillage, monoculture, overgrazing, excessive use of fertilizers or no fertilization, the application of herbicides, periodic burning, deposition and accumulation of organic waste, wastewater and drugs via livestock waste, among other aggressions.			systems. • It was transited from a silvopastoral livestock to another stable, with unhealthy practices for the consumer. • Few highly technified producers generate value, retain value and access to financing. • Lack of cooperation, there is no group work. • Low political motivation of unions and livestock associations. • There is no generational change. • Theft of cattle and physical insecurity and impunity. • There are no secure communication channels to transport the products. • Intermediarism or coyotaje. • Paternalism.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
				• The prices of the products offered by the farmer are the lowest in the supply route, therefore retains very little value of the final price of the product. • There is no protection to the domestic market.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Silvopastoral System (milk)	**The soil can be eroded or lose its structure** due to the action of compaction caused by overgrazing, as well as its contamination associated with the use of agrochemicals. Water can be contaminated due to the inappropriate use of agrochemicals, which can harm those who use it, humans or animals. **The air is contaminated** by the volatilization of ammonia and greenhouse gases (GHG), such as nitrous oxide from soils and enteric		**Earn more.** Synergies between livestock and trees allow a combined system to produce more revenue than a single system. Cows that enjoy well-being produce more milk and meat of higher quality. **Fight climate change**. When planted in degraded pasture, trees capture carbon dioxide. Silvopastoral systems are also beneficial for watersheds and biodiversity. **Have access to financing**. With milk production, there is income each year and the rancher can repay the loan while the trees grow. **Adapt to local conditions**. Silvopastoral systems can be modified to focus more on forestry or livestock depending on the needs of producers.	Divisionism in the dairy sector National and regional political situation Resource management without sustainable criteria Lack of planning towards positive changes and good practices Unprofitable technology Lack of comprehensive training and marketing culture Precarious cost management Medium and long-term support from the Government for projects in the dairy industry Cyclical imbalances Deciphering infrastructure Lack of economic competitiveness	**Cost problems along its productive chain.** Some links are sacrificing profits and that seems to be the reason why some sectors are requesting the release of the dairy price. **Temporality uncertainty.** The seasons that increase milk production do not necessarily imply a bonanza for the producer. The market is not level to receive and buy the surpluses of the spring and summer seasons, and leave the producer at the expense of the speculation market. **Public policies.** One of the main reasons why new public policies are required is the integration of small and medium producers in the production chain. It is also necessary the support of government bodies to establish market prices, offer credits that evoke development and create a fairer scheme so that these producers do not falter in their growth opportunities.	12 months

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	methane produced by animal rumination. **Milk production systems generate waste**, which can have an impact on the environment, and also on milk and its derivatives. The most common of these is the dairy slurry. The slurry is a mixture of animal waste, dirty water that arises from the washing of milking equipment, water from washing floors and other structures, and rainwater that falls on the different buildings. Other waste is generated by				**Consumer culture.** Once a battle has been won in the field of labeling -where products that do not have milk cannot be called that way or where cheeses must comply with certain nutritional components to achieve that label-, the next step will be one of the most complicated: changing the perspective that the consumer has about milk.	

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	the use of chemical products (pesticides, medicines, food additives, etc.), which can contaminate the milk, subsequently being transferred to the final consumer. When water and soil are damaged, the environment is affected, and the biodiversity of the place where the productive system is located can be affected. These changes can be quantified through the determination of the ecological footprint of the type of					

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	productive system (farm, industry, etc.).					

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Sustainable Fishing (octopus)	Intensive exploitation, illegal fishing, increase in population in the coastal zone. Climate change is causing physical and biological changes in the distribution of marine and freshwater species, there is a displacement towards the poles of temperate waters with consequent changes in the size and productivity of their habitats. The increase in temperatures affects the	1.1	A sustainable fishery is managed with the ecosystem in mind. **It protects sensitive species and habitats**. It is a space where it can be seen that the activity does not have a negative impact on the fishing species and where an intense monitoring of all the populations of the ecosystem is carried out, protecting the reproduction and breeding areas. **It keeps populations of all species at a healthy level.** A control is exercised over the activity to prevent the disappearance of existing fish.	Intensive exploitation, illegal fishing, increase in population in the coastal zone, increase in fishing effort. Environmental risks have social repercussions since overfishing and the collapse of fisheries cause a reduction in income and economic efficiency. Likewise, extreme events may affect fishing infrastructure, cause changes in human settlements as well as in the chronology of fishing activities	Implement astringent regulation systems with strict control of access to fishing resources in order to rehabilitate the affected stocks and with the social cost that this implies. Implement integrated management programs in order to find a balance between the use of resources and conservation to promote sustainable systems in the long term.	12 months

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	physiology of fish and, depending on the regions and latitudes, will have both positive and negative effects on fisheries. The presence of a red tide which has had an impact on the fish communities causing mortality and displacement as well as difficulties in terms of commercialization. Pollution of the coastal zone, this is registered by nutrients and organic matter that comes in the contributions of groundwater through discharges of wastewater to the subsoil and the poor condition of the septic tanks of homes.		**It uses selective fishing methods.** They are systems that adapt to the marine habitat, to minimize accidental catches. **Maintains biodiversity.** It works with systems that do not cause substantial alterations in the fishing area. **Minimizes the use of energy,** chemical products and the production of waste in all its operations. **Compliance with current legislation and regulations** is a basic condition to be able to lead a Sustainable Fishing process. **It always facilitates the origin of all your fish from the point of capture to the market (traceability).** It applies a correct labeling and identification system, to control the specimens from fishing until they arrive at the table.	with impacts related to the life strategies of coastal communities. The demands of international markets present a new challenge for local fisheries. • Registration of surveillance which facilitates the development of illegal fishing activities. • Presence of "coyotes" who compete with cooperatives and established companies, affecting the finances of the organizations. • Financing needs of organizations to maintain a "healthy" economy within their activity, avoiding long-term debt. • Need to improve the quality and presentation of the		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
				product to promote the commercialization process. • Little knowledge of better security systems for the development of the activity and that can be provided through various training courses. • Lack of health services for many fishermen even though they participate in a high risk activity. • The need to permanently maintain research on fisheries resources in order to generate solid technical information to ensure its sustainability and to involve its users in research.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Natural protected areas (Bats conservation)	The management for the protection at the institutional level presents the risk of not having the support and the support of its concretion, due to the bureaucratic procedures and the low level of priority in the conservation issue. Due to the environmental characteristics of the area and to be included in one of the states without experience of environmental protection, there may be a long process for its		**Conservation and protection of biodiversity.** The main benefit of protected areas is the conservation of biodiversity, and ecosystems important for the survival of man. Particularly when these areas involve rare, endangered or endemic species, or habitats with little representation, such as grassland, freshwater or marine areas. Regulate the impact of the human being in natural spaces for its preservation or restoration. Capture the excess of atmospheric CO2. Climate regulation. Conservation of water reserves. Maintenance of soil fertility. Source of food and raw materials. • **Employment:** protected areas can	Poor public and private sector financing for this type of environmental conservation actions due to a lack of a guiding plan and coordination and linking strategies of these sectors. The country lacks an instrumentation in the management of natural protected areas. The lack of territorial planning and planning plans have favored changes in the territory and therefore in the landscape.	Involvement of the local social sector in the process of management and design of a conservation area. The environmental characteristics of the area in terms of natural heritage strengthen the management of a space for its conservation.	16 years

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	declaration of order and management.		provide sources of employment for the local population such as administrators, park rangers, wildlife keepers, guides and other direct and indirect jobs related to ecotourism services. Generally, these jobs provide additional educational opportunities. • **Food:** Protected areas provide a variety of foods including wild food plants, game and fish in permitted categories. Traditional agricultural systems and associated agrobiodiversity are increasingly being protected, including locally adapted crops (coffee, cocoa, etc.). Each time there are more protected areas that consider the integral management of the resources. • **Water:** the natural vegetation in the protected areas helps to maintain water quality and in some			

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
			circumstances, also to increase its available quantity (that is, through filtration, groundwater renewal and maintenance of natural flows). Water from protected areas is important for non-commercial use. **Cultural and spiritual values:** many of the oldest protected areas in the world were designated by their cultural and historical values. These may contain important archaeological sites and historical buildings and protect pilgrimage routes and traditional land use systems.			

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
UMAS (whitetail deer)	The abandonment of the activity as an exploitation system is due to economic and technical reasons. The greatest threat to wildlife in Mexico results from a combination of environmental impacts caused by the growth of the population in the country. All the landscapes of Mexico have been modified for use by human	0.99	Spaces to promote alternative production schemes compatible with the care of wildlife, through the rational, orderly and planned use of the renewable natural resources contained in them, and to slow down or reverse the processes of environmental deterioration. The	Government policies increasingly move away from having public funds to fund lost to support social welfare programs based on the promotion of productive agricultural activities, and more specifically for the establishment of UMAs, so it is necessary to perform the analysis financing of projects of this type based on the net margin. Also, the development of consistent policies and programs that endure over time regardless of the country's policy cycles and that guarantee the conservation and sustainable use of wildlife in Mexico. **Deficient management plans.** The management	It is necessary to train producers and constant technical assistance to achieve indicators of reproductive behavior of white-tailed deer that allows growth, profitability and consolidation of the production system.	10 years

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	settlements, roads and productive activities such as the extraction of wood, metals, oil, or agriculture and livestock. **Overexploitation by man in legal and illegal activities, destruction of habitat for productive activities that include deforestation, illegal trafficking mainly of threatened species, invasive species (including diseases and parasites) and climate change.** The pressure of the sport hunting could be very little favorable for some species of more vulnerable fauna of which		improvement of the living conditions of the rural communities and the conservation of the biodiversity. Make the conservation of biodiversity compatible with the production and socioeconomic development needs of Mexico in the rural sector.	plans must guarantee the sustainable use of the species and the integrity of their habitats. However, in many cases the plans are incomplete with questionable and inconsistent information. The lack of institutional capacity to regulate these plans, and personnel lacking adequate training, lead to duplication and plagiarism of management plans and many of these programs do not meet the legal requirements for UMAs. **Estimation of wildlife populations.** Considering the best estimation parameter would be the estimation of population density. **Introduction of exotic fauna.** In order to make the sale of hunting more attractive in the UMAs, a large number of exotic species have been introduced to the country. The competition of exotic species with the local fauna as well as the danger of transmitting diseases has been need to be controlled.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	one has little knowledge. Trafficking, migration, violence and low security of regional zones.					

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
ADVC	Neglect and hunting of the species. Biodiversity loss. Degradation of the soil, illegal logging of trees, monocultures and urbanization. Low income for the community. Droughts and extreme rains.		**Conservation in intimate reciprocity with social development at different scales** (local, regional, national, international, global). Nourished by the advances made in the theory of landscape management and in the new philosophy of sustainable development, it visualizes the protective efforts as part of a set of acts tending to achieve an adequate interaction of society and nature. It proclaims the impossibility of preserving biodiversity without protecting cultural diversity and vice versa. It promotes actions that seek the creation of a system of regions that	Strengthening mechanisms for equitable participation of different sectors of society in the design, implementation and evaluation of normative and public policy instruments related to conservation, sustainable use, management and use of biodiversity, emphasizing the active participation of women and young people in all processes. Guaranteeing the right to access, disposal, and sanitation of water for human and domestic consumption, it is necessary to devote greater efforts, in order to conserve ecosystems, compensate the owners, train them and offer alternative livelihoods. Certification process.	Strengthen instruments, such as payment for environmental services to those who care for and maintain the natural ecosystems where they live in good condition. Promote productive activities with inclusion and equity criteria that contribute to creating jobs and reducing poverty in communities that live in protected areas.	10 years

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
			combine areas of conservation with areas under the management of biodiversity and other resources and ecosystem services, under the general principle of "producing conserving and conserving producing". These spaces must have some of the following characteristics: a) high biological diversity, b) biological importance with cultural value, c) existence of relevant germplasm, e) scientific research, and f) extensive area without trace of civilization.			

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
Ecotourism	Overcrowding in buildings. The contamination of the habitat. An unlimited number of tourists. The site becomes a "honey jar" area. Excess in the number of visits. Erosion where cars park illegally. Erosion and	1.22	It has a minimal impact on the environment. Create awareness and respect for local culture and the environment. It offers positive experiences for all. Use and benefit the communities.	The challenge is to control and limit the impacts of unimpeded nature tourism, while deciding how and where to properly plan the development of ecotourism as a compatible economic development option. The funds for the management of ecotourism areas are usually scarce. These areas often lack the capacity to ensure that tourism generates the wide range of benefits. As a result, in many areas the opportunities to generate	The start of an ecotourism initiative have been the programs of training for guides or the construction of hotels, lodges or cabins. It is almost guaranteed that this way of approaching ecotourism will end in failure. Avoid it. The ecotourism planning process is crucial to developing the potential of ecotourism as a powerful conservation strategy.	12 months

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	loss of soil. The »greenwashing» arises, where the environment is used as a bait to attract tourists. Establishments of large hotels with high energy consumption in a splendid jungle environment without understanding of sustainable development or the correct provisions for the elimination of waste and wastewater. Establishments of tourist centers that displace the local population and illegally keep animals in danger of extinction in cages to attract visitors. Nature tourism,		Educate visitors about political, social and environmental problems. The money of the tourists goes to the conservation of the area. Visitors have new ideas that influence their own environment.	income for the conservation of the site and for local communities are underexploited, and tourism can actually pose threats to conservation.		

Key value chains	Links to Direct Threats	Cost-Benefit	Effectiveness to tackle threats *	Barriers for implementation	Key org / Stakeholders	Cash flow in time
	as opposed to ecotourism, may lack the mechanisms to mitigate impacts on the environment and fail to show respect for local cultures.					

Table 6.2: Prioritization of regions for the development of biodiversity management projects

1	2	3	4	5	6	7	8	9	10	11	12					
	Region	**State**	**% Surface Better biodiversity conditions**	**Municipalities**	**Land use and vegetation**	**Number of Agrarian Nuclei in the area of influence**	**TPS area involved (ha)**	**Forest management %**	**UMAS %**	**ADVC %**	**Productive activity (percentages of the total**					
											Agri-culture		**Agro-forestry**		**Pastures**	
1	North	Chihuahua	a) 80.2 % High b) 12 % Medium c) 7.7 % Low	a) Madera	0.1 % Earnings 1 % Loses 98.9 % Permanence	29	0	5.3	10.7	0	Corn Bean Apple	61.51% 5.33% 0.39%			Forage oats in green	32.76%
2	North	Coahuila	a) 88.1 % High b) 10.1 % Medium c) 1.8 % Low	a) Cuatro Ciénegas	0.5 % Earnings 3 % Loses 96.6 % Permanence	20	579,765.7 (54.3%)	3.7	4.1	0	Cotton	6.94%	Nut	3.72%	Green alfalfa Forage oats in green Feed corn in green	38.91% 16.89% 15.26%
3	North	Durango	a) 85.1 % High b) 12.7 % Medium c) 2.2 % Low	a) Tamazula	0.2 % Earnings 3.3 % Loses 96.5 % Permanence	51	4,422.5 (0.8%)	29.7	5.5	0.1	Corn Beans Avocado	67.97% 6.37% 3.21%			Forage oats in green	12.48%
4	Center	Jalisco	a) 43.0 % High b) 34.8 % Medium c) 22.2 % Low	a) Cabo Corrientes b) Mascota c) San Sebastián del Oeste d)Talpa de Allende	1.6 % Earnings 7.7 % Loses 90.7 % Permanence	67	501,820.3 (77.2%)	23.2	11.2	0	Corn	25.8%	coffee	2.66%	Pastures and meadows Feed corn in green other forages	63.14% 2.93% 0.95%
5	Center	Guanajuato	a) 51 % High b) 35 % Medium c) 14 % Low	a) Atarjea b) Santa Catarina c)Victoria d)Xichú	4 % Earnings 4 % Loses 92 % Permanence	34	0	8.7	0.1	0	Corn Beans	56.15% 42.36%			Green alfalfa	1.17%
6	Center	Querétaro	a) 44.6 % High b) 37.9 % Medium c) 17.5 % Low	a) Pinal de Amoles b) Arroyo Seco c)Peñamiller d)Toliman	3.7 % Earnings 2.1 % Loses 94.1 % Permanence	58	0	1.4	0.1	0	Corn Beans	65.74% 13.31%	orange nut	3.97% 1.37%		

1	2	3	4	5	6	7	8	9	10	11	12					
7	Southeast	Oaxaca	a) 55.6 % High b) 26.3 % Medium c) 18.1 % Low	a) San Felipe Usila b) San Juan Bautista Valle Nacional c)Santa María Jacatepec	4.6 % Earnings 14.5 % Loses 80.9 % Permanence	45	38,407.7 (26.4%)	15.6	0	24.3	Corn	48.76%	Cherry coffe	35.54%	Pastures and meadows	10.09%
8	Southeast	Campeche	a) 42.9 % High b) 32.2 % Medium c) 24.9 % Low	a)Calakmul	4.2 % Earnings 3.7 % Loses 92.1 % Permanence	78	581,385.5 (41.6%)	19.6	20.6	6.3	Corn grain Pumpkin seed or chihua green chile	86.05% 6.54% 4.50%				
9	Southeast	Chiapas	a) 40.4 % High b) 31.1 % Medium c) 28.5 % Low	b)Maravilla Tenejapa	6.2 % Earnings 25.8 % Loses 67.9 % Permanence	18	54,285 (100%)	0	0.3	3	Corn grain Bean Banana	44.72% 15.34% 4.47%	Cherry coffee Cocoa	23.30% 8.64%		

	TYPE	Recommendation	Threats (Recommendation addresses the identified threat: Highly=3; Sufficiently=2; Very moderately=1; Does not=0)				
			Loss and degradation of habitats (related to mitigation)	Pollution and nutrient load	Over-exploitation and unsustainable use	Introduction and spread of invasive species	Climate change. (adaptation)
POLICY AND PROGRAMS	Command and control	1.Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination)	3	3	2	0	1
		2.Speed/strengthen the implementation of the Sustainable Forest Development Law	2	0	2	0	2
		3.Continue the process to enact laws; biodiversity, marine-costal development	1	1	1	1	1
		4.Enact subnational laws on forest and biodiversity	2	1	1	0	2
	Conservation	1.Increase the area of terrestrial natural protected areas to meet Aichi targets and complete (reform) management plans. Work with the private sector and subnational governments.	3	1	1	0	2
		2.Strengthen revenue sources for natural protected areas (eg. charges, restoration subsidies, market opportunities)	2	1	3	1	3
		3.Improve the management and information of Wetlands of international importance	1	2	1	1	2
		4. UMAs - hunting, fishing and breeding as a profitable activity that preserves environments and is sustainable over time	3	1	3	0	2
		5.Integrate all the instruments outside NPA with a comprehensive conservation strategy	2	1	1	2	1
	Economic Instruments	1.Transit from subsidies to market instruments (charges, taxes, markets and private financing)	2	0	1	0	2
		2.Remove environmentally harmful subsidies for energy, technology, water, fertilizers.	1	1	0	0	0
		3.Improve valuation methods for ecosystems services of biodiversity and forest and communicate them effectively.	2	1	2	1	2
		4.Develop sustainable market opportunities in the agricultural, fisheries, forest and tourism sectors	3	1	2	0	1
	Planning and Governance	1.Strengthen the legal basis for multiyear strategies. – Use international commitments as a tool.	0	0	1	0	1
		2.Establish solid institutional cross-sectorial bodies for policy planning and implementation	2	0	1	0	1
		3. Promote and establish monitoring, traceability & transparency platforms, including standardized GIS platforms	1	1	1	1	1
		4.Extend the use of biological corridors. Advance the Productive Sustainable Territories (TPS) project.	3	1	2	1	2
		5.Assure environmental integrity of signature projects and programs (eg. Sembrando Vida)	2	1	1	0	3
		6.Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejido* and forest communities, among others.	2	1	1	0	2
		1.Use regional and local governance schemes as focalization and prioritization platforms for landscape management.	2	1	2	0	2
		1. Promote coordination / working tables for key issues and landscapes	1	1	2	0	2

	TYPE	Recommendation	Threats (Recommendation addresses the identified threat: Highly=3; Sufficiently=2; Very moderately=1; Does not=0)				
			Loss and degradation of habitats (related to mitigation)	Pollution and nutrient load	Over-exploitation and unsustainable use	Introduction and spread of invasive species	Climate change. (adaptation)
PRODUCTION AND MARKETS		1.Planning with phasing-out of grants and appropriation from producers	1	1	1	0	1
		2.Organization of producers and initial investment levels. Economies of scale.	2	1	3	0	2
		3.Multi-year scope and certainty above amount of resources.	1	0	1	0	1
		4.Identify and engage a strategic champion / “broker”	2	0	2	0	1
		5. Document and keep track of cases – avoid overlap	1	0	1	0	1
		6. Integrate cultural considerations and local stakeholders	1	0	2	0	1
		7. Address pressing challenges (e.g. water scarcity)	2	2	2	0	3
	Implementation of practices	1.Work with menu of alternatives ("one-size does not fit all”) and progressive phases	1	1	1	0	3
		2.**Diversification** needed for profitability, sustainability and resilience.	2	1	2	0	3
		3.Adding value through the right stakeholder.	2	1	1	0	1
		4.Integration of connectivity through sustainable productive landscapes	3	1	2	1	2
		5.Build capacities for certification / standard schemes	3	1	2	1	2
		6. Build financial and market capacities in local stakeholders	3	1	2	1	2
	Private sector	1.Understand local markets and untap their potential. Differentiate intervention by type of market	3	0	1	0	1
		2.Engagement by including B&F into their “core-business”. Invest in capacity building for the private sector.	2	1	2	0	2
		3.Evidence the costs of inaction and the quantifiable benefits of B&F (e.g. insurance mechanisms, genetic resources for production improvement, etc.)	3	1	3	0	3
	Finance	1.Support and work with private sector & development agencies to provide competitive finance (e.g. BID-Lab)	2	1	1	0	3
		2.Include financial needs and possibilities at the planning stage.	2	1	2	0	2
			74	34	62	11	69

	TYPE	Recommendation	GAPS (¿Recommendation addresses the identified Ga				
			Weakness in effective planning processes and ME&L	Need for articulation of stakeholders by geography & key topic	Very few innovation networks that link applied research, extension services, private sector	Lack of understanding of local markets	Need to strenghthen governance structures
POLICY AND PROGRAMS	Command and control	1.Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination)	2	3	1	0	3
		2.Speed/strengthen the implementation of the Sustainable Forest Development Law	1	2	2	1	3
		3.Continue the process to enact laws; biodiversity, marine-costal development	1	3	1	0	3
		4.Enact subnational laws on forest and biodiversity	1	1	1	0	3
	Conservation	1.Increase the area of terrestrial natural protected areas to meet Aichi targets and complete (reform) management plans. Work with the private sector and subnational governments.	1	1	1	0	2
		2.Strengthen revenue sources for natural protected areas (eg. charges, restoration subsidies, market opportunities)	2	1	1	1	3
		3.Improve the management and information of Wetlands of international importance	1	1	1	0	2
		4. UMAs - hunting, fishing and breeding as a profitable activity that preserves environments and is sustainable over time	2	2	2	2	3
		5.Integrate all the instruments outside NPA with a comprehensive conservation strategy	1	3	1	1	3
	Economic Instruments	1.Transit from subsidies to market instruments (charges, taxes, markets and private financing)	2	1	2	1	3
		2.Remove environmentally harmful subsidies for energy, technology, water, fertilizers.	0	1	0	3	3
		3.Improve valuation methods for ecosystems services of biodiversity and forest and communicate them effectively.	2	1	1	2	2
		4.Develop sustainable market opportunities in the agricultural, fisheries, forest and tourism sectors	2	3	2	3	3
	Planning and Governance	1.Strengthen the legal basis for multiyear strategies. – Use international commitments as a tool.	1	2	0	0	1
		2.Establish solid institutional cross-sectorial bodies for policy planning and implementation	3	1	1	0	3
		3. Promote and establish monitoring, traceability & transparency platforms, including standardized GIS platforms	3	2	2	2	3
		4.Extend the use of biological corridors. Advance the Productive Sustainable Territories (TPS) project.	3	2	3	2	3
		5.Assure environmental integrity of signature projects and programs (eg. Sembrando Vida)	3	2	3	2	3
		6.Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejido* and forest communities, among others.	3	3	2	2	3
		1.Use regional and local governance schemes as focalization and prioritization platforms for landscape management.	2	3	3	2	3
		1. Promote coordination / working tables for key issues and landscapes	2	2	1	0	3

	TYPE	Recommendation	GAPS (¿Recommendation addresses the identified Ga				
			Weakness in effective planning processes and ME&L	Need for articulation of stakeholders by geography & key topic	Very few innovation networks that link applied research, extension services, private sector	Lack of understanding of local markets	Need to strenghthen governance structures
PRODUCTION AND MARKETS		1.Planning with phasing-out of grants and appropriation from producers	1	2	0	1	3
		2.Organization of producers and initial investment levels. Economies of scale.	3	3	3	2	3
		3.Multi-year scope and certainty above amount of resources.	0	0	0	0	1
		4.Identify and engage a strategic champion / "broker"	0	3	1	1	3
		5. Document and keep track of cases – avoid overlap	3	3	2	2	3
		6. Integrate cultural considerations and local stakeholders	2	2	0	0	3
		7. Address pressing challenges (e.g. water scarcity)	3	3	3	2	3
	Implementation of practices	1.Work with menu of alternatives ("one-size does not fit all") and progressive phases	1	2	1	1	1
		2.**Diversification** needed for profitability, sustainability and resilience.	2	2	3	3	3
		3.Adding value through the right stakeholder.	1	1	1	1	1
		4.Integration of connectivity through sustainable productive landscapes	1	1	3	1	1
		5.Build capacities for certification / standard schemes	1	2	2	2	1
		6. Build financial and market capacities in local stakeholders	1	1	1	2	2
	Private sector	1.Understand local markets and untap their potential. Differentiate intervention by type of market	0	1	1	3	2
		2.Engagement by including B&F into their "core-business". Invest in capacity building for the private sector.	2	2	2	3	2
		3.Evidence the costs of inaction and the quantifiable benefits of B&F (e.g. insurance mechanisms, genetic resources for production improvement, etc.)	3	2	3	1	3
	Finance	1.Support and work with private sector & development agencies to provide competitive finance (e.g. BID-Lab)	3	2	1	2	2
		2.Include financial needs and possibilities at the planning stage.	1	2	1	1	2
			66	74	59	52	97

	TYPE	Recommendation	Private sector capacities taken for granted for integration of sustainability into core business	Transparency on programs, resources and data can be strenthened for B&F	Several competing GIS platforms	Lack of clarity regarding valuation of ecosystem services for sectors and particularly markets	Excessive proceedures and formalities in the forestry sector
		ap? Highly=3; Sufficiently=2; Very moderately=1; Does not=0)					
POLICY AND PROGRAMS	Command and control	1.Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination)	2	3	2	1	2
		2.Speed/strengthen the implementation of the Sustainable Forest Development Law	1	1	1	2	1
		3.Continue the process to enact laws; biodiversity, marine-costal development	0	1	3	1	1
		4.Enact subnational laws on forest and biodiversity	0	1	2	1	0
	Conservation	1.Increase the area of terrestrial natural protected areas to meet Aichi targets and complete (reform) management plans. Work with the private sector and subnational governments.	0	0	3	0	0
		2.Strengthen revenue sources for natural protected areas (eg. charges, restoration subsidies, market opportunities)	1	1	2	1	0
		3.Improve the management and information of Wetlands of international importance	1	1	3	1	0
		4. UMAs - hunting, fishing and breeding as a profitable activity that preserves environments and is sustainable over time	2	1	2	2	1
		5.Integrate all the instruments outside NPA with a comprehensive conservation strategy	0	1	2	1	1
	Economic Instruments	1.Transit from subsidies to market instruments (charges, taxes, markets and private financing)	1	0	2	1	0
		2.Remove environmentally harmful subsidies for energy, technology, water, fertilizers.	1	2	3	1	1
		3.Improve valuation methods for ecosystems services of biodiversity and forest and communicate them effectively.	2	2	3	1	1
		4.Develop sustainable market opportunities in the agricultural, fisheries, forest and tourism sectors	3	0	1	2	3
	Planning and Governance	1.Strengthen the legal basis for multiyear strategies. – Use international commitments as a tool.	2	0	0	0	0
		2.Establish solid institutional cross-sectorial bodies for policy planning and implementation	2	2	0	1	0
		3. Promote and establish monitoring, traceability & transparency platforms, including standardized GIS platforms	3	1	2	2	1
		4.Extend the use of biological corridors. Advance the Productive Sustainable Territories (TPS) project.	2	1	1	2	2
		5.Assure environmental integrity of signature projects and programs (eg. Sembrando Vida)	2	1	2	1	1
		6.Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejido* and forest communities, among others.	2	2	2	2	1
		1.Use regional and local governance schemes as focalization and prioritization platforms for landscape management.	1	1	1	1	1
		1. Promote coordination / working tables for key issues and landscapes	1	1	1	1	1

	TYPE	Recommendation	ıp? Highly=3; Sufficiently=2; Very moderately=1; Does not=0)				
			Private sector capacities taken for granted for integration of sustainability into core business	Transparency on programs, resources and data can be strenthened for B&F	Several competing GIS platforms	Lack of clarity regarding valuation of ecosystem services for sectors and particularly markets	Excessive proceedures and formalities in the forestry sector
PRODUCTION AND MARKETS		1.Planning with phasing-out of grants and appropriation from producers	1	1	1	1	0
		2.Organization of producers and initial investment levels. Economies of scale.	2	2	1	2	0
		3.Multi-year scope and certainty above amount of resources.	1	1	0	0	0
		4.Identify and engage a strategic champion / “broker”	1	1	0	1	0
		5. Document and keep track of cases – avoid overlap	2	2	1	1	1
		6. Integrate cultural considerations and local stakeholders	0	2	0	1	0
		7. Address pressing challenges (e.g. water scarcity)	1	2	3	1	0
	Implementation of practices	1.Work with menu of alternatives ("one-size does not fit all”) and progressive phases	1	1	1	1	1
		2.**Diversification** needed for profitability, sustainability and resilience.	3	1	2	3	2
		3.Adding value through the right stakeholder.	1	1	0	1	1
		4.Integration of connectivity through sustainable productive landscapes	1	1	1	1	1
		5.Build capacities for certification / standard schemes	1	1	1	1	1
		6. Build financial and market capacities in local stakeholders	1	1	1	1	1
	Private sector	1.Understand local markets and untap their potential. Differentiate intervention by type of market	1	2	1	1	1
		2.Engagement by including B&F into their “core-business”. Invest in capacity building for the private sector.	3	1	1	3	0
		3.Evidence the costs of inaction and the quantifiable benefits of B&F (e.g. insurance mechanisms, genetic resources for production improvement, etc.)	2	2	1	1	1
	Finance	1.Support and work with private sector & development agencies to provide competitive finance (e.g. BID-Lab)	1	1	1	3	1
		2.Include financial needs and possibilities at the planning stage.	1	3	1	2	1
			53	49	55	50	30

	TYPE	Recommendation	Feasibility			Priority	Priority (Average)
			Economic *Needed investment* (high= 0, medium=1, low=2 investment)	**Technical/institutional** *Existing capabilities* (high= 2, medium=1, low=0)	**Political** (high= 2, medium=1, low=0)		
POLICY AND PROGRAMS	Command and control	1.Strengthen enforcement capacities for existing laws and regulations (financial, technical, coordination)	0	1	1	30	30.0
		2.Speed/strengthen the implementation of the Sustainable Forest Development Law	0	1	1	23	23.7
		3.Continue the process to enact laws; biodiversity, marine-costal development	0	0	1	20	26.7
		4.Enact subnational laws on forest and biodiversity	0	2	1	19	22.3
	Conservation	1.Increase the area of terrestrial natural protected areas to meet Aichi targets and complete (reform) management plans. Work with the private sector and subnational governments.	0	2	0	17	20.7
		2.Strengthen revenue sources for natural protected areas (eg. charges, restoration subsidies, market opportunities)	2	2	2	29	23.3
		3.Improve the management and information of Wetlands of international importance	1	1	0	20	22.3
		4. UMAs - hunting, fishing and breeding as a profitable activity that preserves environments and is sustainable over time	2	2	2	34	34.0
		5.Integrate all the instruments outside NPA with a comprehensive conservation strategy	0	1	0	22	31.0
	Economic Instruments	1.Transit from subsidies to market instruments (charges, taxes, markets and private financing)	0	1	1	20	27.7
		2.Remove environmentally harmful subsidies for energy, technology, water, fertilizers.	0	0	0	17	23.3
		3.Improve valuation methods for ecosystems services of biodiversity and forest and communicate them effectively.	1	1	1	28	27.0
		4.Develop sustainable market opportunities in the agricultural, fisheries, forest and tourism sectors	1	1	2	33	33.0
	Planning and Governance	1.Strengthen the legal basis for multiyear strategies. – Use international commitments as a tool.	1	1	1	11	23.7
		2.Establish solid institutional cross-sectorial bodies for policy planning and implementation	1	1	1	20	30.0
		3. Promote and establish monitoring, traceability & transparency platforms, including standardized GIS platforms	0	1	1	28	27.7
		4.Extend the use of biological corridors. Advance the Productive Sustainable Territories (TPS) project.	1	2	1	34	32.3
		5.Assure environmental integrity of signature projects and programs (eg. Sembrando Vida)	1	2	2	32	24.7
		6.Strengthen the capacity of regional and local governance or collaboration schemes including inter-municipal and watershed councils, biocultural landscape bodies, *ejido* and forest communities, among others.	1	2	2	33	34.7
		1.Use regional and local governance schemes as focalization and prioritization platforms for landscape management.	0	1	0	26	31.0
		1. Promote coordination / working tables for key issues and landscapes	0	0	1	20	29.0

	TYPE	Recommendation	Feasibility				
			Economic *Needed investment* (high= 0, medium=1, low=2 investment)	**Technical/institutional** *Existing capabilities* (high= 2, medium=1, low=0)	**Political** (high= 2, medium=1, low=0)	**Priority**	**Priority (Average)**
PRODUCTION AND MARKETS		1.Planning with phasing-out of grants and appropriation from producers	0	1	0	16	21.0
		2.Organization of producers and initial investment levels. Economies of scale.	0	1	1	31	30.5
		3.Multi-year scope and certainty above amount of resources.	0	1	0	7	22.5
		4.Identify and engage a strategic champion / "broker"	1	1	1	19	24.0
		5. Document and keep track of cases – avoid overlap	2	2	1	28	27.0
		6. Integrate cultural considerations and local stakeholders	2	1	1	18	22.5
		7. Address pressing challenges (e.g. water scarcity)	1	1	1	33	33.5
	Implementation of practices	1.Work with menu of alternatives ("one-size does not fit all") and progressive phases	2	2	2	23	25.0
		2.**Diversification** needed for profitability, sustainability and resilience.	2	2	2	38	34.0
		3.Adding value through the right stakeholder.	1	1	1	17	20.5
		4.Integration of connectivity through sustainable productive landscapes	1	2	2	26	28.5
		5.Build capacities for certification / standard schemes	0	2	2	26	29.5
		6. Build financial and market capacities in local stakeholders	1	2	2	26	21.5
	Private sector	1.Understand local markets and untap their potential. Differentiate intervention by type of market	1	1	1	21	24.5
		2.Engagement by including B&F into their "core-business". Invest in capacity building for the private sector.	2	2	2	32	21.5
		3.Evidence the costs of inaction and the quantifiable benefits of B&F (e.g. insurance mechanisms, genetic resources for production improvement, etc.)	1	1	2	33	29.5
	Finance	1.Support and work with private sector & development agencies to provide competitive finance (e.g. BID-Lab)	1	2	1	28	28.0
		2.Include financial needs and possibilities at the planning stage.	2	2	1	27	27.0
			32	52	44		

ANNEX 6. SITE VISIT DETAILS/CASE STUDIES

Field Visit to Campeche
(June 19-21, 2019)

Context:
The Port of Campeche is part of the Yucatan Peninsula, being a point of reference regarding the areas of greatest terrestrial and marine biodiversity in Mexico. In turn, the region is recognized for the development of biodiversity conservation projects in Mexico, both in marine and terrestrial ecosystems: fishing, forestry, silvopastoral and agroforestry systems.
In the region, academic research units such as ECOSUR generate basic and applied research studies in collaboration with communities (ejidos) and fishing cooperatives to collect evidence on conservation processes in the region.

The research work includes studies on common and Mayan octopus fishing, beekeeping in small communities, silvopastoral systems, agroforestry, forestry, UMAS and conservation within natural protected areas.

Innovation:
The innovations in the region are divided according to the economic activity analyzed
• Octopus fishing rescues a traditional activity called garete (Palo de enganche) fishing that only catches octopuses' males with the use of live baits, leaving the females out of the capture process, additionally the animal is not damaged and a traceability mark can be generated. This type of capture.
• Beekeeping in the region is limited to organic and conventional producers, organic production is less vulnerable to international price variation
• Silvopastoral systems are another biodiversity conservation strategy, by using native species for cattle in their production systems with successful examples in the region.
• Forestry and agroforestry systems are cases of success and study in the region, especially for the community management of resources.
• The management of UMA-s for both deer hunting and crocodile farming represents a conservation activity that shows the recovery of wild populations in the region.

Improved practices:
- Conservation fishing systems,
- Governance in forest systems
- Support systems for the development of small bee producers
- Support for the implementation of UMAS

Implementation costs/Investments:

The investment of fishing activities as a traditional activity in the region has no support in the region.
The beekeeping, UMAs and Forestry activities are supported by both the Ministry of Agriculture and the Environment. Depending on the time of implementation, most of the initial investments are done with support from non-repayable grants or subsidies.

Market opportunities:
• City of Cancun meat market
• City of Cancun coal market
• Organic honey international market
• Local octopus, national and international market

Results:
- Development of a collection center for bee-keeping products

- Operating rules and closures for octopus fishing systems
- A silvopastoral process research system with native flora species has been developed

Recommendations to scale up:

Development of signaling system and traceability of biodiversity-friendly products to access better producer prices, development of local markets, and development of governance processes to generate economies of scale within communities.

Key lessons learned:
• There are price differences for certified products and organic seals.
• Improvements in studies on native flora species and improvement of genetics in the production of Bovines have higher turnover and higher profits, therefore, lower pressures for agricultural frontier expansion.
• Support for production systems to very small producers are a real option if there is a process to support technical and market capabilities; this is the case with beekeeping in the region.

Field Visit to Calakmul – Quintana Roo / Campeche
(July 15-18)

Context:

Calakmul is a region within the Mayan peninsula, located in the southeast of the Mexican state of Campeche, in the Petén region, in the core of the Calakmul biosphere reserve, of more than 700,000 ha, municipality of the same name and few kilometers from the border with Guatemala. Region recognized for having the best community forest management systems on the peninsula, being a biodiversity conservation center for forest species and in particular jaguars, tapirs, peccaries among other threatened species.

In the region, community work for the development of biodiversity conservation efforts has been supported by multiple international organizations, international cooperation and government support. Resulting in a number of conservation and production experiences as support systems for biodiversity. Being the most emblematic projects: community forest management projects in particular mahogany, the use of ramón nut, exploitation of Xate palm, use of non-timber products in general, charcoal, both certified and conventional honey and in particular honey from melipona bees, as well as uses of UMAS dedicated to the hunting of various species of deer, birds and wild boars.

The most outstanding innovation in the region is limited to the partial domestication of melipona bees in boxes of local design and the introduction of hunting Umas to hunting circuits nationally and internationally.

Innovation:

The innovations in the region are divided according to the economic activity analyzed
• Beekeeping in the region is limited to organic and conventional producers, organic production is less vulnerable to international price variation. While the raising of melipona bees is an activity of high economic value, but still represents considerable technical challenges for small producers
• Forestry and agroforestry systems are cases of success and study in the region, especially for the community management of resources. Production and management certifications have not yet shown the expectations of price differentials.
• The management of UMAs for both deer hunting represents a conservation activity that shows the recovery of wild populations in the region. The relative income from non-forest use of regions established as UMAs shows very interesting rates of return despite the transaction cost and permits.

Improved practices:

• Governance in forest systems, certification of timber and non-timber products
• Support systems for the development of small bee producers
• Introduction of the UMAS to national and international hunting circuits

Implementation costs/Investments:

- • Beekeeping activities, UMAs and Forestry projects are supported by both the Ministry of Agriculture and the Environment. The project implementation costs had various sources of international cooperation projects. GIZ, PPD, USAID, FM, CONABIO

Market opportunities:

- • City of Cancun coal market
- • Organic honey international market
- • Hunting circuits internationally
-

Results:

• FSC certification for timber and non-timber products
• Consolidated market of uses of deer hunting UMAs
• Consolidated organic honey market.
• Governance in the production projects of biodiversity-friendly products

Recommendations to scale up:

• Development of signaling and traceability system for biodiversity-friendly products to access better producer prices; development of local markets, development of governance processes to generate economies of scale within communities
• Development of studies for the extension of hunting permits according to the load capacity of the established UMAs

Key lessons learned:

- There are price differences in certified products and with organic seals
- Support for production systems to very small producers is a real option if there is a process of technical and market support, as was the case with beekeeping in the Campeche region.
- If the UMAs are advertised through digital channels, they can access consumers nationally and internationally, with a greater willingness to pay for hunting activities.

Field Visit to the State of Jalisco

(July 23-26, 2019)

Context: What was the starting point? Key stakeholders? Geography?

1. Jalisco is one of the five states for the Emissions Reduction Initiative (ERI) with relevant areas of forests and marshes.
2. It is a leading agricultural state with staple and high value agricultural products (cattle, poultry, eggs, corn, berries, avocado, and sugarcane) and is a spot for tourism in its coasts (Puerto Vallarta).

3. It leads or hosts several relevant initiatives such as the Biological Corridor for the West of Mexico (COBIOCOM) and the Biocultural Landscape for Jalisco Sierra Occidental.
4. Stakeholders include: State government, Federal government (CONAFOR, SADER), farmers and farmer unions, Universidad de Guadalajara (UdG) and its regional centers, and agroindustry.

Innovation: What drove change? How was change achieved?
We see innovation for conservation in the following areas:

a) Geospatial analysis. The state government possess good GIS capacities.
b) Governance structures.
    a. The Intermunicipal associations or juntas were initially promoted several years ago for residue management and were used as a tool for REDD+ mechanism latter. Now they are being used as a key element for public policy with a landscape approach.
    b. Also, other efforts such as the Corridor for Biocultural integration in West Mexico (COBIOCOM) has a preeminent participation of Jalisco (plus 7 other states) and is being supported by Reforestamos Mexico to promote connectivity and coordination at a regional scale.
    c. The Biocultural Landscape for Sierra Occidental in Jalisco is another governance effort supported by AFD to promote decision making processes with a bottom-up approach. It coordinates stakeholders in the landscape to promote appropriation of their natural and cultural resources.
c) Public policy. The State Government has institutional and political will to better plan interventions through landscape approach, using the intermunicipal associations as intermediate governance platforms. The current Minister of Environment was a key stakeholder in the design of intermunicipal associations in the past and has a strong institutional will to further this agenda.
d) Improved and traditional practices in agriculture and ranching. The team visited three types of productive systems and interviewed farmers for maize production linked to the market (see next section for details).

Improved practices: Specific practices (productive, governance, institutional, etc.)

a) Geospatial analysis. Improvement in scale, data and analysis to measure deforestation rates and to use GIS to target public policy more effectively.
b) Governance structures. The state government is strengthening existent intermunicipal associations and promoting new ones to cover the territory as a tool to articulate activities at a landscape approach and to promote collaboration with stakeholders such as universities, extension services, etc. Also, the biocultural landscape for Jalisco's Sierra Occidental is testing a bottom up approach for promoting decision making at a larger landscape scale.
c) Public policy. Intermunicipal associations as intermediate governance platforms. Improved productive practices to stop the agricultural frontier expansion is promoted by the Ministry of Environment and Ministry of Agriculture through their programs. The Ministry of Environment plans according to instruments such as PES to avoid leakage and uses the structure of the intermunicipal associations. SSP is oriented mostly to small and medium sized farmers.
d) Improved and traditional practices in agriculture and ranching.

The team visited three types of productive systems:

    a. Silvopastoril ranching (SSP). No land conversion. Ranchers in current ranching areas are introducing rotational and intensive techniques.
    b. Traditional agroforestry for pineapple production. This practice has been implemented in South Jalisco for at least 300 years for pineapple production under forest cover. Associated crops include vanilla, citrus, zapote, among others. The practice is disappearing due to expansion of ranching.
    c. Holistic management and zero deforestation ranching. Angus breading. Due to scarce rain and underwater, the family has implemented a system for water harvesting. They use rotational grazing with native vegetation and have inscribed a natural voluntary area for conservation to protect biodiversity and ecosystem services. The family is currently

processing and commercializing a brand of zero deforestation, high quality Angus meat in different cities. Further plans include selling online and exports.

The team interviewed two farmers/farmers associations:

a. An association of smallholders producing maize under conservation agriculture (Agrinjal). They are currently suppliers of Pepsico. They face a great challenge under climate change (drought, water scarcity) and degradation by other crops such as agave and avocado)
b. Organic coffee under agroecological practices. Group of 13 families working under improved practices. They have bought machinery for processing and are currently distributing in Guadalajara market under their own brand. They are planting cocoa too. They have faced resistance from local intermediaries and leaders.

Implementation costs/Investments:

a) Maize: They produce 7 ton/ha rainfed agriculture. They face important restrictions from water scarcity. Their priority is to invest in water harvesting infrastructure.
b) Coffee: The group bought machinery for processing and accessed credit from local savings and loans cooperatives. By reducing intermediaries (coyotes) they receive now $2 more.

Market opportunities: Are there market opportunities to profit from? Or opportunities untapped that the project help to identify or access?

c) Silvopastoril ranching (SSP) represent good ROI after 3 to 5 years and diminution of costs through in-farm production of inputs. Nonetheless, these systems require an initial investment which disincentivize the implementation by ranchers. Still, improvements and related investments can be gradual and public policies and programs can provide incentives to mitigate initial costs (as is happening in Jalisco). Scale is important to be more competitive.
d) Traditional agroforestry for pineapple production. Niche market opportunities can be explored. Local markets are keen of the product. Still, lack of promotion are leading this practices to extinguish.
e) Holistic management and zero deforestation ranching. High value markets and export potential. “Los Fresnos” Ranch can become an articulator for commercializing zero deforestation ranching in the region, since they are part of the Association of Angus Breeders.
f) Organic coffee has high market value due to its high quality. The group is already selling directly to coffee roasters and specialized coffee shops.

The Government of Jalisco has signed a Collaboration Agreement with Rainforest Alliance to certify sustainable supply chains for agave, avocado and berries.

Results: What have been the results until now?

1. Geospatial analysis. The State Government is developing a GIS platform to articulate its programs. They are testing state for the Forest Monitoring System with CONAFOR.
2. Governance structures & public policy. The Intermunicipal associations or juntas are being structured state wide as a mechanism for landscape management. Collaborations with other sectors such as tourism and agriculture are part of the strategy. The COBIOCOM is currently identifying hotspots for collaboration among involved states and will begin alignment of policies and efforts.

The State government has good collaboration with SADER delegation for targeting efforts and including sustainability criteria in agricultural subsidies.

The state government is designing a comprehensive implementation strategy including several sectors according to regional/landscape challenges and threats.

3. Improved practices (See sections above “Market Opportunities” & “Improved practices”.

Risks for Conservation of Biodiversity and Forests

1. High value crops represent is the major threat through land conversion; links with illegal activities are identified (e.g. avocado).

2. Criminal or illegal groups in illegal logging and land conversion.

Recommendations to scale up: what needs to be done in order to scale in $, territory, people?

1. Articulate more explicitly other ministries/sectors into the intermunicipal associations model, as well as promotion of innovation systems (in other words, linkages with universities, private sector, and government).
2. More extension services to expand capacity for improved practices.
3. Inclusion of private sector and identification of local market dynamics and potential.

Field Visit to the State of Sonora
(August 19-22, 2019)

Context

Sonora is the second largest state in Mexico with an extension of 179 503km2. It borders with the Arizona (United States) to the north, Chihuahua to the east, Sinaloa to the South and the Golf of California to the West. It is also the fifth least populated state with a density of 14.83 people/ km2. The state has 72 municipalities and its capital is Hermosillo.

Sonora has the ninth largest economy in Mexico contributing with 3.3% to the national GDP. Its economy has been growing steadily 2.3% for the past 3 years generating close to 16 thousand new jobs. Manufacturing of different products has been growing in the last decades and today the machinery and equipment industry represents 12% of the total economy. However, the primary sector including mining, livestock and agriculture still account for a relevant share of the economy. For instance, nonoil mining is the second largest industry in the state with a share of 11% of the total GDP.

There are 24 types of weather from very arid to tropical sub humid. However, most of its territory is dominated by semiarid deserts and prairies. Sonora is one of the most biodiverse States in Mexico. There are currently 6, 498 documented species in the state including 3, 227 plants, 1,072 vertebrates and 896 vertebrates. Different pressures including over hunting and illegal extraction, land use change, introduction of invasive species and climate change have placed a burden on biodiversity in the last decades. Two spices have become extinct, 18 extirpated and there are currently 247species in the standard of endangered species (NOM 059).

In addition to national public policies, the state of Sonora has a number of instruments for the conservation and sustainable use of biodiversity and forest. These include an environment state law as well as number of conservation, planning and sustainable use instruments. The government institution responsible for environmental and conservation policies is the Commission of Ecology and Sustainable Development (CEDES) but it coordinates certain instruments with other government bodies such as the State Secretariats of Economy and Agriculture/Livestock/Fisheries among others. Private sector actors, especially in the agriculture, livestock and mining industries are important due to their potential impact on biodiversity. The academia, productive and social communities, as well as indigenous people are also relevant in terms of resource use and land use planning. The participation of Federal Government agencies particularly SEMARNAT, CONAFOR, CONANP and PROFEPA complement the responsibilities of state authorities with regards to biodiversity and natural resources.

Innovation

In 2017 the state government of Sonora in partnership with the federal government (Semarnat) and the Global Green Growth Institute introduced a statewide green growth strategy. The strategy aims at propelling economic growth and social development by embracing innovation, resource efficiency and low environmental impact practices. It includes 4 pillars: de-carbonization and energy independence, life quality and resilience to climate change, innovation and social inclusion, resource and material efficiency. The strategy is implemented through a cabinet composed of the main economic and social policy institutions of the state government and lead by the Governor´s office. Each cabinet secretariat has its goals and projects to promote green growth in the state. In the framework of the strategy, biodiversity and forest conservation fall under the responsibilities of CEDES, SAGARPHA and the Secretariat of Economy.

The government of Sonora is also in the process of developing its state biodiversity strategy. In 2017 a collaboration agreement between CONABIO and the state government of Sonora was signed to develop the strategy as well as the state biodiversity institution. A study documenting the state of biodiversity has been completed in accordance with the first phase of the initiative. To complete the strategy, the state government requires to organize a series of workshops and topic specific studies with an estimated budget of 1 million pesos.

Other goals for the current administration in the area of environment and conservation include:

- Enactment of the state climate change law,
- Establishment of an environmental fund and financing tools including green bonds,
- Strengthening of the air quality monitoring and policy frameworks,
- Improvement of the solid waste policy framework and infrastructure, including a solid waste law,
- Expansion of the territory under natural protected areas and strengthening the efficiency of current ones.

Improved practices

In the specific case of biodiversity and forest conservation, different instruments are applied in the state of Sonora ranging from federal to local and from command and control to conservation, planning and market instruments. Federal regulations apply to wildlife conservation, forest resources and land use change, costal development, mining, energy and federal infrastructure.

<u>Conservation</u>

About 14% of the state´s land surface is under protection with 5 federal and 4 state natural protected areas (NPA). The State areas are:

- Estero El Soldado: 322 ha (ecological conservation area).
- Dams system “AbelardoRodríguez Luján–El Molinito”: 17,282.6 ha. (state reserve).
- Arivechi-Cerro Las Conchas: 72, 300 ha (ecological conservation area).
- San Bernardino: 39,593.2 ha (state reserve).

Lack of resources for surveillance in these areas, particularly the ones under state jurisdiction is a constant. However efforts have been made by CEDES to complete its management plans and there are currently two completed and the other two underway. In addition, the state has registered 14 sites under the RAMSAR convention enhancing the protecting of 1,000,000 hectares of wetland ecosystems. The lack of operational budget for state NPA has encouraged CEDES to seek alternative funding sources. In the case of "El Estero del Soldado" reserve partnerships with private corporations have been established to finance part of the infrastructure such as the electric power with photovoltaic panels. Coordinated fundraising initiatives have also been explored such as fitness and education events.

In the area of *insitu* conservation, the state government through CEDES manages the Ecological Center of Sonora. This unique facility was established in 1985 to preserve, exhibit and reproduce species from the state and other ecosystems. Located near Hermosillo, the Center has a 2.8km walk with all the state´s representative ecosystems (desert, mountain, prairies and coastal areas). A number of native endanger species such as the desert sheep, the jaguar, the Mexican gray wolf and the desert turtle have been successfully reproduced in the center. It has a museum and educational activities to raise awareness of the importance to preserve the biological diversity in the state. CEDES has invited members from the privet sector to participate in the board of the Ecological Center in order to expand the funding sources.

Ecological Territorial Planning

The state decreed its terrestrial ecological land use plan (ELUP) in 2015 and a costal land use plan in 2008. These instruments establish the basis for the economic and social development of the state based on its human, business and natural resources potential. It includes a 2030 vision to spur sustainable development in the state by preserving and recovering ecological and economic services of ecosystems. Priority areas for conservation and sustainable use of natural resources will be established. The key sectors for the implementation of this plan are: agriculture and livestock, aquaculture and fisheries, mining, tourism, urban development, sustainable wildlife management and forest,

Units of Wild life management (UMAS)

Units of for the conservation of wildlife (UMAS) are defined as productive or exhibition units in a given area under different types of land tenure (private, communal, federal, *ejidal*, etc.) where sustainable use of wildlife resources is allowed. There are two types of UMAS: 1) extractive (hunting ranches, pet nurseries, ornament, scientific collection and inputs for industries); 2) non extractive (research, exhibition, ecotourism and education). Sonora is famous for the success of its extractive UMAS specially hunting ranches. There are currently 1,634 umas registered in the State covering an extension of 7,396,304 ha. Some of the species under management include the dessert sheep, desert mule deer, Coues deer, wild pig, puma, doves and quails.

Early in 2000, the government of Sonora requested the decentralization of umas management from the federal government and the legal competence was granted to Sonora's Undersecretariat of livestock (Subsecretaría de Ganadería de SAGARPHA).

This institutional change has strengthened the relationship with livestock production units making them aware of alternative income opportunities and fostering conservation and sustainable use of wildlife throughout the state. As an example, the market price of desert sheep bred in captivity ranges from 35 to 60 thousand dollars depending on the size and hunting ranch. It is estimated that the sustainable hunting business in the state has a value of 35 to 40 million dollars a year. Putting a market value on desert wild sheep has expanded conservation of this species both in private and public land increasing its number 8 fold in the last twenty years. The same trend has followed for other mammal species managed under umas as well as species related to them within the ecosystem including predators. The association of Sonora ranchers have created a technical advisory council that assesses the state of priority species in the state and finance conservation projects and species reintroduction.
Areas Voluntarily Designated for Conservation (ADVCs) have a significant potential in the state of Sonora due to its extension and the large share of privately-owned land. The National Commission of Natural Protected Areas (CONANP) has already discussed options with the State Undersecretariat of Livestock on converting both umas and ranch properties into ADVCs. Apparently, ranchers would have the incentive of adopting this scheme since it reinforces legal certainty over their property rights.

Compensation projects

Compensation instruments have been used in a number of cases in the state of Sonora and the government recognizes it as an opportunity for financing key projects. There are two types of compensations: a) commutation of a fine for violating and environmental regulation (federal or state) where the authority and the violator agree on a compensation project; b) compensation through the Land Use Change Compensation mechanism applied to infrastructure projects of federal jurisdiction. Promoters of a project are required by law to reforest/restore an area equivalent to the area deforested through a payment into a compensation fund managed by CONAFOR. The state government of Sonora has used both schemes. Both schemes have been applied in the state with promising results.

Law enforcement

Responsibilities for law enforcement is shared between federal and state authorities. The Federal Attorney for Environmental Protection (PROFEPA) is responsible for monitoring and enforcing environmental and natural resources laws of federal jurisdiction which in the case of biodiversity and forest embrace environmental impact of federal jurisdiction projects, wild life conservation and management, costal development, sustainable forestry and land use change. The State Environmental Attorney (PROAES) is in charge of enforcing the state environmental law including air emissions, solid and special management was, and land use change at the state level. Although state regulations have fewer competences over biodiversity and forest resources, its jurisdiction is important in buffer zones between urban and rural areas.
Illegal extraction and trafficking of birds, mammals, endangered marine species as well as timber and no-timber forest products stand out among the major violations to federal laws. Illegal fishing of Totaba, an endangered species of pelagic fish from the Golf of California, became a landmark for low enforcement due to its impact in *vaquita marina* population, price in Asian markets (US$50,000/km) and link with organized crime. Mining

operations and construction of federal infrastructure present further pressure on biodiversity and forest resources. In the case of mining, there have been chemical spills into water bodies and a number of facilities fall short on tailing ponds. Lack of enforcement capacity both at the federal and state level is evident. The number of POFEPA inspectors in all areas went from 60 to 30 in the last 5 years and PROAES practically lacks monitoring capacities. While enforcement capacity is already weak, impunity due to lack of sentences for law violations exacerbates the problem. The judiciary system in Sonora and most of Mexico is poorly prepared to solve environment and natural resources disputes and cases.

Phytosanitary control, research and improved practices

CESAVE is an organism integrated by farmers through seven local juntas. It is an auxiliary organism for SADER and SENASICA. Sonora exports 90% of its production and phytosanitary control is a key element for commercialization, market access and differentiation.

Sonora is a pioneer state to work with climatic alerts. CESAVE is linked to 110 climatic stations and promotes research projects in collaboration with INIFAP and farmers. In CESAVE technical groups participate to help provide technical solutions. A strategic project is to develop a model for prediction of plagues. Regarding improved practices, CESAVE promotes integrated pest management.

Market opportunities

Sonora is an example of the potential of market opportunities for biodiversity sustainable use. As it was mentioned in the case of extractive umas, placing a market value on species is paramount for its conservation and recovery. The market potential of desert sheep has reached $40 million dollars a year without being fully exploited. Other terrestrial wild animal species with market potential are already being sold particularly in international markets.

State tourism policy is also beginning to integrate comprehensive options which consider hunting, rural and ecotourism activities as well as sport fishing. This initiative could be further developed. As it was shown in the case of the “El Estero del Soldado” reserve, opportunities for ecotourism in NPA could be reinforced by exploring partnerships with private and social actors.

In the agriculture and livestock sector, preliminary assessments on integrated agricultural practices and sustainable management of waste through biodigesters has been undertaken, as well as integrated pest management for crops. Finally, great potential remains untapped by linking companies with farmers, research, improved practices and technology for climate adaptation. (See section above: “Phytosanitary control, research and improved practices”).

Key Lessons Learned

1) ***Solid strategies and governance structures are important for conservation of biodiversity and forest****:* The Green Growth Strategy of the State of Sonora has been key for setting multiyear commitments on conservation and sustainable use of resources within a sector integrated framework. The strategy aims at spurring economic growth and social development and applies resources efficiency and conservation policies as a means not as an end. It also capitalizes

political will by placing its leadership in the Governors offices. Other examples successful governance structures that foster conservation and sustainable use of biodiversity have been found in the livestock, fisheries and to a lesser extend in the agriculture communities.

2) ***Placing a value on biodiversity is key for its conservation and recovery***: The extractive umas case in the state of Sonora has been a landmark example of the positive impact from placing a value on biodiversity. Markets for wildlife have fostered private initiatives for its conservations and sustainable use with proven population and ecosystems recovery as well as income spillover effects.

3) ***Extension of land and certainty over property rights make a difference***: For some species, connectivity and territorial extension is fundamental for their existences. Unlike other parts of the country, most agriculture and livestock production units in Sonora are relatively large and privately owned providing for better wild life conservation conditions and more certainty over property rights. This reduces the transaction cost of coordinating with several tenures to secure a large extension of land for conservation as it happens in other parts of the country.

4) **Illegal activities must be addressed within a comprehensive framework**: Enforcement of violations to environmental and natural resources laws are complex and demand intensive surveillance capacities. In some cases they tend to be linked with organized crime exacerbating the risk and increasing enforcement cost. In light of reduce budgets in the environmental sector, surveillance most be streamlined by strengthening coordination between federal, state and local authorities and by capitalizing resources from other enforcement agencies outside the environmental sector. However, improvements in monitoring and prosecution capacities will be fruitless until the problem of impunity and conviction is addressed within the judiciary system. Judges need to be better prepared and willing to solve environmental and natural resources cases to increase the incentives of complying with corresponding laws.

5) **Financing strategies should consider public and private sources**: The trend of budget cuts will continue in the next years. In all sectors, including environment and conservation, government authorities will need to partner with other actors for a cost-effective implementation of strategies and projects. The government of Sonora has shown that opportunities for private financing from grants for NPA to market opportunities for wild life conservation and sustainable use can be capitalized.

ANNEX 7. IDENTIFIED THREATS TO BIODIVERSITY AND FOREST CONSERVATION

1. Loss and Degradation of Habitats

Deforestation[1] and forest degradation are the main causes of natural capital loss in Mexico, particularly biodiversity loss and ecosystem services. Mexico conserves only 50 percent of its original natural vegetation. The most severe rates of deforestation were seen between 1970 and 2000 and habitats were left highly fragmented. In spite that rates have diminished, the tendency of deterioration of habitats continues.

Gross deforestation reported by Mexico has fallen in the last decades.[2] From 2010 to 2015 net deforestation was 0. 14 percent or 91,600 ha per year, but still gross deforestation remained at 358,000 ha/year (World Bank, 2018). The reason for this sharp decline in the levels of gross deforestation and forest degradation since 2007 have not been systematized, but it may be due in part to differences in the sources and the resolution of the official inputs used to measure deforestation, and to public programs such as PES as OCDE and FAO point out.

Forest degradation reached 250,000 and 300,000 ha per year according national preliminary estimations (FAO, 2010; CONAFOR, 2014b in ERI, 2017). Fifty six percent of forest soils present some extent of degradation and 53.4 percent present erosion according to the National Forest Inventory. Degradation affects mainly tropical forests and mountain mesophyll forest.

Compared with deforestation, degradation processes are usually more complex to measure and follow: they might show recovery periodically (e.g. rotational agriculture such as *milpa*) or are gradually seen in vegetation cover (Skutsch, et al, 2013 in ERI 2017).

1.1. Drivers

Agriculture. Agricultural expansion is the greatest source of emissions from land use change, but it is less representative than emissions from agriculture and livestock production practices. Emissions are driven by deforestation (91.4 percent) and to a lesser extent to loss of grasslands (8.6 percent). According to projections based on global food demand, total forest cover is expected to decrease from 98 million hectares in 2013, to

[1] Deforestation is process in which the vegetation is lost, and therefore the ecosystem's capacity to regenerate is lost as well (Balderas, et al, 2015 in ERI, 2017).

[2] Between 1993 and 2002, deforestation was reported at 522,800 ha/year; 668,700 ha/year from 2002-2007; and 348,000 ha/year for the period 2007-2011 (World Bank, 2018).

96 million hectares in 2030 and 93 million hectares in 2050, driven by the expansion of agricultural lands (INECC 2018b).[3]

Cattle ranching. Historically, the conversion of forest lands to grasslands have been the main driver of deforestation and degradation. Extensive ranching grew from 38.8 million hectares in 1940 to 90.4 by 1983 (Carabias, et al, 2009), representing the main deforestation driver in Mexico. The main cause of degradation is compaction (68 percent), which is often related to livestock presence.

Cattle ranching represents 7.8 percent of emissions from the AFOLU sector and 47 percent from land use change. Cattle grazing is also a main cause of forest degradation and it was identified in 67.4 percent of sample plots of the forest inventory (CONAFOR, 2018a). Furthermore, emissions from land use change related to cattle expansion are expected to increase the next ten years. Recent trends of cattle expansion and current policies point to a significant threat of forest conversion into grasslands (INECC 2018b).

Illegal logging. Estimates of emissions for illegal logging represent a gap in information, but timber with an illegal origin produced in Mexico could range between 30 and 50 percent (Alarcón & Corona, 2017). According to some interviews performed, illegal logging is not reported as the primary concern for deforestation, but there are cases that exemplify levels of organization and/or links with groups exporting illegal timber (e.g. rosewood). Also, lack of competitiveness in the sector provides incentives for illegality and land use change.

Fires. In 2018, CONAFOR registered 6,970 fires that affected 488,161.87 hectares, which is a significant amount compared with an average of 8,717 fires registered annually between 1998-2013 affecting only 17,070.05 hectares (CONAFOR, 2019). Fires are the main source identified of tree damage and death in the National Forest Inventory (CONAFOR, Inventario Nacional Forestal y de Suelos: Informe de resultados 2011-2014, 2018a). Temperate forests are the most affected by fires.

Urban expansion. Concentration of population in cities exercise a considerable pressure on ecosystems and frequently have a profound ecological footprint[4]. This includes land use change at accelerated rates. Nonetheless, cities also provide an opportunity for optimization of resource use through an intelligent urban planning; for example, a priority should be to protect conservation areas and its biodiversity to maintain ecosystem services for cities.

1.2. Underlying Causes

Institutional factors. The most relevant include: lack of efficient measures for the control of land use change; weak coordination between different institutions and sectors in the government; inefficient administration of collective or common use of resources; poor community organization /weakening of social capital to control land use and

[3] This projection is based on global food demand – OECD/FAO Agricultural Outlook.
[4] In other words, go beyond the limits of goods and services that ecosystems can provide.

implementation of sustainable practices; policies and programs that support the cattle or agricultural sector that may lead to further pressure.

Of particular importance according to interviews is overregulation. Transaction costs to access permits and administrative processes for logging and forest management, combined with the lack of human and financial resources for law enforcement (PROFEPA, judiciary), disincentives legal and sustainable forest management, leads to clearing land for other uses or illegal logging, and keeps out small areas from formal management (Ellis et al.,2015; CCMSS, 2018). Also, sustainable forest activities are uncompetitive *vis a vis* other productive activities such as agriculture and ranching.

Market factors include rising prices and increasing demand of products such as non-timber products, timber or meat that lead to overexploitation of resources. Increased forage demand for milk and meat production leads to more agricultural areas for grains production as animal feed. National and international market incentives for cash crops such as palm oil, avocado, agave, soy, maize and biofuels, among others, are likely to drive agricultural expansion in the coming years.[5] In addition, current degraded forest areas may become agricultural lands.

Relevant examples and trends of land use change observed in field visits and interviews include: a) avocado expansion in Jalisco and Michoacán, driven by market demand and high value, as well as by illegality and crime; b) agave expansion in Jalisco displacing grazing lands and less valuable crops into forested areas (same as avocado); c) purchase of land by Mennonite communities and private owners, reinforced by market demand and profitability of crops (e.g. soy) and demographic dynamics of these particular groups.

Poverty and marginalization that lead to subsistence farming or forest use above the regenerative capacity of forests and ecosystem are the main underlying causes of forest degradation. Examples include overgrazing, selective logging, intensification of rotational crops such as milpa, and unsustainable extraction of wood.

Poor practices. Uncontrolled agricultural burns are the main cause of wildfires, just as poor productive practices lead to degradation of soils and a need for further expansion of the agricultural frontier. Even forest management that is poorly performed can lead to degradation of forests and eventually to deforestation.

It is worth noting that deforestation and degradation processes rarely have a linear relationship; processes are complex and show multi-causality and feedback loops. Forest loss can happen in a single event when, for example, land is cleared permanently for opening areas for monocrops or big infrastructure projects (e.g. high value crops such as avocado). Also, deforestation may follow several steps before stabilizing: land may be cleared to plant rainfed crops in areas that are prone to erosion; degraded lands are

[5] Crops that expanded their harvested area considerably between 2010 and 2017 are barley (32 percent), cotton (88 percent), soy (71 percent), and avocado[5] (53 percent). Other crops occupy a smaller share of the harvested area but are expanding rapidly, such as palm oil (107 percent), rubber (62 percent), berries (47 percent) or vegetables (e. g. asparagus -59 percent-).

left for ranching and finally used for crops such as palm oil. A commonly seen processes is transition from forests and rainforests to disturbed vegetation or secondary forests, and later to pastures and agricultural lands.

1.3. Observed Consequences:

- Increased rates of extinction particularly for endemic species.
- Habitat fragmentation is one of the main causes for biodiversity loss. It affects habitat structure and quality, microclimate, hydrology, and wildfire recolonization and dispersal (FAO 2019)
- Degradation overtime may lead to absolute forest loss.
- Loss of biodiversity and of ecosystem services.
    - Effects on productivity of agriculture and ranching systems
    - Reduced capacity for rainwater retention and recharge of aquifers
    - Reduced adaptation capacity and higher costs against the effects of climate change (raising temperatures, drought, intense rainfalls, etc.)

- Deforestation and soil erosion lead to sedimentation of water bodies, increasing pollution and eutrophication as well as silting (Carabias y Landa 2006).

2. Pollution and Nutrient Load

They affect all ecosystems with pollutants of all kinds: chemicals, metalloids, oil, solid disposals, industrial waste, and untreated wastewater from agriculture, household and industry. Contaminants do not only affect flora and fauna in all ecosystems, they also travel downstream polluting water bodies. Aquatic and coastal habitats are better documented than other ecosystems.

Mangroves are being affected by several sources of pollution: industrial discharge (food and beverage, textile, sugarcane production, etc), municipal wastewater, untreated agrochemicals and manure which lead to eutrophication. In the southeast region, wetlands are polluted by oil and chemical industries (Carabias y Landa 2006). Also, the ocean is the main receiver of pollutants. In Mexico, the Gulf of Mexico is particularly affected by downstream pollution from the Mississippi River. Coral reefs, which are particularly important due to their high biodiversity in small relative areas and their role for reproduction of species are being severely affected by several sources of contamination

2.1. Drivers

Unsustainable tourism and infrastructure. Contamination from hotel and port infrastructure, sedimentation, discharge of untreated wastewater, contamination from urban coastal populations, and physical destruction from anchorage from boats or unsustainable tourism and extraction for handcrafts.

Agriculture and ranching. Inputs for the agricultural sector may contain chemicals,

pathogens, antimicrobials, metals and others. There is especial concern about some pesticides that affect pollinators, and herbicides that may damage native flora. Water runoff of these substances affect underwater and water bodies, including the ocean. Only 5 percent of residue water from agriculture receive treatment before discharge (Capital Natural).

Untreated wastewater. According to the National Water Commission, most rivers and lakes present a level of contamination and treated waters are still very small compared to the total.

2.2. Underlying Causes

- Breaching of the National Water Law mandate to treat wastewater before disposal. Lack of supervision capacities and resources at municipal level to fulfill the mandate.
- Public programs and subsidies that incentivize fertilizer use. For example, *PROFERTIL* supports fertilizer acquisition providing credit guarantees, and *Producción para el Bienestar* Program[6], a cash transfer for input acquisition, including fertilizers for sugarcane producers.
- Lack of technical assistance for efficient use of fertilizer. Farmers usually overuse fertilizers and inputs at their farm. Soil analysis is not an extended practice.
- Lack of knowledge about and limited use of alternative practices (e.g. conservation agriculture) due to different factors such as use of crop residues for cattle feed, lack of specific machinery or cultural considerations.

2.3. Observed Consequences:

- Eutrophication and degradation of aquatic habitats.
- Damaged biodiversity in soils and affected soil health, therefore decreased fertility and less capacity of soils to be an effective carbon sink.
- Contamination of water bodies and soils (therefore food and recreation spaces); harm to human health and biodiversity.
- Poor irrigation practices in agriculture lead to salinization of soils and contamination by agro-chemicals.
- Poor quality of water and soil available for terrestrial and aquatic flora and wildlife.

3. Over-exploitation and Unsustainable Use

Although, updating of information and precise quantification of species and biodiversity loss is a daunting task, CONABIO quantifies an overall loss of 127 species from which 58 percent were endemic, meaning that they have been lost forever. Official estimates point that 83.2 percent of marine fisheries are not susceptible of increasing production and

[6] https://www. gob. mx/conadesuca/es/articulos/produccion-para-el-bienestar-apoyo-para-caneros-sader-2019?idiom=es

many require immediate actions for sustainable use. High deforestation rates exacerbate native vegetation loss and prevent the full sustainable use of Mexico´s forest potential.

3.1. Drivers

Overfishing and unsustainable practices have led to extinction of emblematic species such as *vaquita marina*, and fishing activities have altered critical interactions in ecosystems by modifying its populations. Destruction of coastal areas for production of highly demanded species such as shrimp, eliminates key habitats for protection and reproduction of marine species and leads to contamination and eutrophication of water bodies.

Overexploitation of species with food and economic importance, through massive hunting and gathering. The number of species with economic and cultural value in Mexico is immense: 5000 plants and 215 fungi have been identified as useful for human use and 1,293 species of plants have been documented to be used in only the temperate forests of six states. In most cases, exploitation practices are unsustainable, directly from natural sources with scarce or no regulation mechanisms. Examples of unsustainable extraction include species such as palma camedor (*Chamaedorea* – "xate") that is exported illegally; bromelias (e.g. *Aechmea magdalenae* "pita"); candelilla (*Euphorbia antissyphilitica*), among plenty others.

Illegal traffic of species. The magnitude of plant and animal traffic usually exceeds the surveillance capacity of the government. For example, it is estimated that only 2 percent of illegal traffic of parakeet are confiscated. The legal framework allows trade of some species and their sustainable use and provides some rules under the International Convention for Threatened Species (CITES). Still, the amount of illegal trade is considerable (e.g. seven to eight million specimens of cactus are illegally traded globally) for species such as orchids, palms, cycads, tarantulas, birds, among others. A high percentage of this trade takes place through Mexico-US border.

(For illegal logging, see *Loss and degradation of habitats*)

Over-extraction of water for human use and irrigation has led to depleted aquifers particularly in Center and North Regions.

3.2. Underlying Causes

*Lack of knowledg*e regarding populations, both in marine and terrestrial ecosystems lead to overexploitation. For example, 86 percent of the 65 largest fresh water bodies in the country lack information regarding the state of fisheries populations.

Valuable traditional knowledge for sustainable production and conservation is kept by communities and smallholders without being systemized; with aging populations, traditional knowledge is being lost. Natural capital is undervalued as an asset in financial and economic markets, as well as for enhanced livelihoods.

Poverty and marginalization. As stated in sections above, lack of employment, economic options in rural areas and poverty lead communities to overexploitation of natural resources as their main source of subsistence lead to unsustainable use.

Lack of law enforcement, despite the fact the government promotes laws and quotas to restrict species exploitation, surveillance capacity is limited.

Market demand particularly of highly valued species lead to destruction of coast water bodies, wetlands and other ecosystems, as well as to overexploitation, which in turn lead to biodiversity loss. International traffic of wildlife is a millionaire business; prices abroad range from a few dollars to hundreds or thousands.

Hunting of wildlife. As natural habitats are reduced and more fragmented, wild predators present a threat to livestock and farms, motivating ranchers to hunt wild animals. Also, traditionally communities have used different animal and plant species for their meat, skin, bones, oil, pigments, and medicinal properties. For example, in tropical forests in the Southern region, 60 species of mammals, reptiles and birds have been documented as used in those terms. Large vertebrate herbivores and omnivores are the most threatened populations as a result of hunting practices.

More models for sustainable use are needed. Although models such as UMAs are successful and promising, more schemes that allow land-owners to derive economic benefit from sustainable use are needed. For a long time, landowners didn't receive economic benefits from the use of natural ecosystems. [7]

3.3. Observed Consequences

- In spite of their regeneration capacity, unsustainable use and overexploitation lead to elimination of natural populations. Extraction or overhunting lead to the "empty forest syndrome", where apparently healthy forests lack wildlife.
- Additional costs for communities that need to pay for extraction in other landowners' properties.
- The capacity of marine ecosystems to provide food is severely diminished.
- Alteration of life cycle of species due to deterioration of coastal, marine and terrestrial ecosystems.
- Soil and water degradation
- Over extraction of aquifers, coupled with water scarcity from climate change, exacerbates the stress on ecosystems.

4. Introduction and Spread of Invasive Species

Exotic and invasive species are those that are introduced in ecosystems outside their natural distribution area and that, due to their characteristics, are able to colonize causing

[7] Timer production exportation permits were awarded to third parties until 1986 and permits for hunting ended with the creation of UMAs and the new General Law for Wildlife in 2000.

important harm in their new environment. In Mexico, at least 46 species from IUCN's list of "100 more harmful invasive species" have been reported. From the 682 plant species registered, 154 are considered invasive (CONABIO 2017).

Information regarding eradication and control programs for exotic wildlife in Mexico is particularly scarce for a mega diverse country. CONABIO's effort to establish a Program with information on Invasive Species represents progress in this area; it integrates a national database to evaluate risk and decision-making.

4.1. Drivers

Increased fluxes of people and goods by land and sea due to international and national trade, transport and tourism facilitate movement of domestic and wild species.

4.2. Underlying Causes

Norms to regulate these movements and exchanges are largely insufficient to mitigate introduction of invasive species. *The enforcement of existing laws is also weak.*

Lack of general knowledge regarding the consequences of invasive species contributes to movement of species. Controlled introductions of foreign species have been accompanied by accidental introductions, diseases and parasites.

4.3. Observed Consequences

- Significant impact on biodiversity, health and economic losses.
- Through predation and alteration of habitats, invasive species provoke physical and chemical alteration of soils, introduction of seeds and diseases, and imbalance in trophic chains where communities and ecosystems are dramatically affected.
- Degradation of ecosystems provoke that native species and their habitats are more vulnerable to the effects of invasive species. This is easily seen in agriculture where plagues affect crops, livestock and forest species of economic importance.
- Exotic species are responsible for a very high number of extinction, particularly in islands. In Mexico, 22 extinctions of native vertebrates have been caused by exotic invasive mammals in islands and has been associated with the disappearance of 60 percent of native Mexican fish species.
- There is an important gap in data regarding economic losses associated with introduction of invasive species. Data from other countries point to significant costs (e.g. United States 120,000 million in 2005). In Mexico, few cases have been observed and documented: *Hypostomus Plecostomus*, an ornamental fish from South America, has caused at least USD 13 million in losses to commercial fisheries in Mexico from 2000-2017.

5. Climate Change

There is a broad consensus in the global scientific community that the increasing

accumulation of GHG in the atmosphere is associated with the observed increase in global average atmospheric temperature. Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels. In this context, biodiversity, forest loss and climate change hold a close and complex set of relationships.

5.1. Drivers and Underlying Causes

Climate change is both a threat to conservation of biodiversity and forests and an effect of ecosystem loss and degradation. As noted in sections above, deforestation and forest degradation are the main cause of biodiversity loss, but it is also a primary concern for GHG emissions: it accounts for 6 to 9 percent of total emissions in Mexico. In this regard, drivers and underlying causes of climate change are therefore closely related to deforestation and forest degradation (See section above: Loss and degradation of habitats).

5.2. Observed Consequences

Understanding of climate change effects on the structure and performance of ecosystems is still an incipient discipline. Yet, information regarding climate change and general models point to the following:

- Mexico is particularly vulnerable to climate change as a result of its location in the tropics, its geography and its weak social and economic structure in rural areas.
- Due to its geographic conditions, Mexico is exposed to severe droughts that will intensify with climate change.
- In absence of adaptation and mitigation strategies, Mexico will experiment high sensitivity to water erosion and loss of soil quality seen as a fast decline of organic matter content and soil loss.[8]
- Floods and impacts by hurricanes will be more severe, especially in the absence of well-preserved coastal ecosystems.
- Rural population depends heavily on agriculture. Seventy percent of people's economic activity in 50 percent of municipalities relate to the primary sector (PNUD-INECC) and subsistence agriculture involves mainly maize and bean production for self-consumption, crops which will be highly affected with variations in temperature. Therefore, food security will be heavily compromised in rainfed areas that have populations under poverty and with limited financial, social and natural capital (PNUD-INECC).
- Conditions of vulnerability and poor agricultural practices drive farmers to open up new areas for production and/or migrate to urban areas or abroad. As they open more land for agriculture, less forests and natural ecosystems are able to provide ecosystem services.

[8] Of the total 13 million hectares of arable lands on slopes very few have measures implemented to control water erosion (Turrent-Fernández *et al. 2016).*

- Ecosystems and biodiversity are facing thresholds of stability due to climate change effects.

Conservation and sustainable use of ecosystems is crucial for management of vital resources such as water and soil, particularly in arid and semiarid areas that are threatened by desertification. For all the reasons stated above, it is imperative that adaptation and mitigation measures are planned and taken.

ANNEX 8. IDENTIFIED GAPS TO EFFECTIVELY ADDRESS BIODIVERSITY AND FOREST CONSERVATION

1. **Weakness in effective planning processes and ME&L**
2. **Need for articulation of stakeholders by geography & key topic**
3. **Very few innovation networks that link applied research, extension services, private sector**
4. **Lack of understanding of local markets**
5. **Need to strengthen governance structures**
6. **Private sector capacities taken for granted for integration of sustainability into core business**
7. **Transparency on programs, resources and data can be strengthened for B&F**
8. **Several competing GIS platforms**
9. **Lack of clarity regarding valuation of ecosystem services for sectors and particularly markets**
10. **Excessive procedures and formalities in the forestry sector**

ANNEX 9. CONTRIBUTION OF DO SUSTAINABLE LANDSCAPES TO USAID LOCAL SYSTEM OBJECTIVES

How is this DO contributing to USAID Local Systems objectives?

1. **By recognizing and integrating different parts of society (governments, civil society, private sector, universities, individual citizens and others) that jointly produce a particular development outcome.**

- **The Alliance for Sustainable Landscape and Markets** (Rainforest Alliance) provides assistance to develop partnerships with the public and private sector for sustainable sourcing in agroforestry and forestlands.
- **Sustainable Management of Community Lands II** (Consejo Civil Mexicano para la Silvicultura Sostenible) has strengthen capacities of ejidos, communities and promoted partnership with the private sector.
- **MREDD+ Alliance** (conclude intervention in 2017) enabled interactions with multiple stakeholders to build the REDD+ mechanism in Mexico through a broad consultation process, from policy and financial design to testing on the ground productive practices and promoting governance structures with communities, producers, academia, and GOM at different scales.

2. **By reinforcing Mexico's internally determined development priorities (country ownership) and arrangements (country systems).**

- **Sustainable Landscapes (U.S. Forest Service)** works with the Mexican National Forestry Commission to improve its monitoring capacity.
- **Stanford University** (Stanford University) works with private sector and Government of Mexico in designing effective carbon policy, business solutions, and forest-carbon credits as part of a national emission trading system in Mexico.
- **Communities and Renewable Energy** (Iniciativa Climática de Mexico) works with a priority topic/sector for the GOM and incoming investment: energy development projects.
- **Sustainable Landscapes Development Credit Authority**, Implementers (FINDECA and Logra) works to expand credit to small-holders which represents an identified gap in rural development in Mexico; it is directed to sustainable agricultural activities, livestock-ranching, and forestry-management which are priority activities for the National REDD+ Strategy and are aligned with Mexico's commitments for the Paris Agreement (NDC) and Bonn Agreement.

3. **By contributing to sustainability, meaning the ability of a local system to produce desired outcomes over time and to be both resilient and adaptive in the face of changing circumstances.**

DO4 identifies as a priority the development of value chains and markets. Both value chains and market mechanisms need the interaction of stakeholders for a correct functioning. Moreover, tapping into the capacity of markets and value chains is a way to promote sustainability as a way to produce desired outcomes overtime.

- **Sustainable Management of Community Lands II** (Consejo Civil Mexicano para la Silvicultura Sostenible) has strengthen capacities of ejidos, communities and promoted partnership with the private sector. It has also strengthened governance structures (Committees in Ejidos) for sustainability through time.
- Activities for the financial inclusion and access to credit help strengthen sustainability of interventions. (e.g. **Consejo Civil Mexicano para la Silvicultura Sostenible** activities with ejidos and **DCA** activities through implementers).

ANNEX 10. PRIORITIES OF THE FEDERAL GOVERNMENT OF MEXICO 2019-2024

The current priorities of the GOM have been signaled in a number of spaces including the presidential camping, morning speeches from the president and his cabinet, policy decisions in different portfolios and the National Development Plan 2019-2024 (PND). Some of the key priorities are poverty alleviation, breaching income inequality, social development, especially among vulnerable groups (e.g. elder, youth, women, rural communities); tackling corruption and enhancing the rule of law; and improving public safety and national security.

The current PND comprises four sections. As noted in previous sections, the current PND is vague regarding goals in the environment and natural resources sector. The topic of sustainable development is part of the social policy agenda, but it only addresses general considerations for crosscutting effects (socials and environmental) of governmental policies and economic growth without signaling the direction of biodiversity and forest policies. The current PND also includes general specifications on signature projects and programs. A number of these programs and projects have received attention due to its potential impacts on biodiversity and ecosystems:

a) ***Sembrando Vida* Program*:*** Subsidy to low income rural land tenors to plant fruit and timber trees operated by the Ministry of Welfare. It is being implemented in the states of Campeche, Chiapas, Chihuahua, Colima, Durango, Guerrero, Hidalgo, Michoacan, Morelos, Oaxaca, Puebla, Quintana Roo, San Luis Potosi, Sinaloa, Tabasco, Tamaulipas, Tlaxcala, Veracruz and Yucatan. A $5,000 pesos subsidy and production inputs (plants, equipment, tools) are provided to land tenors of 2.5 hectares plots. Technical assistance to manage agroforestry projects is also considered. The subsidy prioritize the elderly and low income populations in rural communities and aims at improving food security, access to alternative sources of income and enhancing vegetation coverage up to one million hectares. Impacts on biodiversity and ecosystems from this program have not been analyzed and very limited consultation have been conducted with institutions with clear relevance on the policy such as SEMARNAT, CONAFOR and SADER. A number of the officials interviewed reported potential inconsistencies of this program with current laws, standards, guidelines and principles.

b) ***Tren Maya***: It is the most important infrastructure project of the current administration consisting on 525 kilometers of rail tracks through the states of Chiapas, Tabasco, Campeche, Yucatán y Quintana Roo that will connect major cities and tourist sites. With an investment of 150 billion pesos both the rail tracks and 15 stations will be constructed. The project has been highly criticized for its potential impacts on one of the most important biodiversity rich regions of the country.

c) ***International Airport "Felipe Ángeles" in Santa Lucía***: After the cancelation of Mexico´s City International Airport project from the previous administration in Texcoco, a proposal to build an airport in the military base of Santa Lucia, located in the municipality of Zaumpango in the State of Mexico, was presented. Santa Lucia´s

Airport will have three landing tracks and a potential of 190 thousand annual flights carrying 20 million passengers. Environmental groups have presented 80 judicial appeals against the construction of the airport due to its potential impacts on the environment and the project is currently under litigation. The President of Mexico has criticized both the appeals presented by environmental groups and the lengthy process of environmental impact assessment regulations to approve the project. Some of the potential impacts to biodiversity identified in the environmental impact assessment s include vegetation removal, impact on fauna, especially birds, due to noise and habitat alteration, pressure on water bodies and increase of air pollution levels among others.

d) ***Dos Bocas* Refinery*:*** Under the line of action *Rescue of the energy sector,* policies and projects will be conducted to improve energy security and self-sufficiency, including reengineering and restructuring the finances and operations of electric energy and oil and gas companies (CFE and PEMEX). A key measure to enhance self-sufficiency in gasoline and other petrochemicals will be to refurbish current refineries and construct a new one. *Dos Bocas* will be a refinery with a production potential of 340 thousand daily barrels of gasoline and diesel constructed in a 700-hectare plot in the state of Tabasco. The project will be constructed in federal public land and presents potential impacts to biodiversity including deforestation, land degradation, restrictions and modification of mobility for fauna species, pollution to water bodies among others. PEMEX is in the process of obtaining the environmental permit for the project and has presented its environmental impact assessment and compensation measures. However, there have been reports in the media that vegetation had been

ANNEX 11. GOALS AND ACTIONS RELATED TO BIODIVERSITY AND FOREST CONSERVATION IN NON-ENVIRONMENTAL SECTORAL PROGRAMS 2013-2018

Agriculture, Fisheries and Food Development Sectoral Program 2013-2018
Objective 4. Foster Sustainable Use of Natural Resources of the country.
Strategy 4.1 Promote technification of irrigation systems and optimal water use
Lines of action:
4.1.1. Incentivize the use of efficient irrigation technologies in agricultural plots trough the Technical Irrigation Component.

4.1.2. Promote the construction of infrastructure for new irrigation areas.

4.1.3. Boost the construction of plot drainage systems

4.1.4. Foment technological and productive conversion towards crops with lower water requirements and higher market demand.

4.1.5. Promote productive conversion in irrigation zones with water scarcity.

4.1.6. Update and refurbish irrigation District Units.

4.1.7. Foster productive activities for aquifers water recharge.

4.1.8. Strengthen actions and infrastructure for rain water harvest.

Strategy 4.2. Boost sustainable practices in agricultures, livestock, fisheries and aquaculture activities.

Lines of action:

4.2.1. Foster sustainable practices through conservation and sustainable use of water and soil, prioritizing organized producers.

4.2.2. Promote the adoption of conservation and agroecological tillage practices through the Program for the Modernization of Sustainable Traditional Agriculture (MASAGRO).

4.2.3. Foment rational use of agrochemicals and fertilizers, incentivize integrated waste management. Fomentar la aplicación racional de agroquímicos y fertilizantes, e incentivar la gestión integral de residuos.

4.2.4. Promote the use of biofertilizers.

4.2.5. Foster the production of ecofriendly crops, especially in Southeast Mexico.

4.2.6. Boost actions for the reduction of greenhouse gas emissions.

4.2.7. Incentivize the biological control of manure waste.

4.2.8. Strengthen the suitability of fishing and aquaculture activities.

4.2.9. Strengthen surveillance and law enforcement of fisheries and aquaculture resources.

4.2.10. Improve conditions of fisheries and aquaculture production zones.

Strategy 4.3 Establish instruments to preserve and boost genetic resources

Lines of action:

4.3.1. Promote the conservation and use of genetic resources, as well as the preservation of natural protected area.

4.3.2. Articulate public and private institutions to legally protect strategic genetic resources for the food and industrial sectors.

4.3.3. Develop non-traditional genetic resources research in order to identify new uses.

4.3.4. Create value chains for local genetic resources.

4.3.5 Add value to genetic resources through new approaches for technology development and transfer.

Strategy 4.4 Use biotechnology based on thorough scientific analysis and safeguards to protect genetic diversity, human health and the environment

Lines of action:

4.4.1. Preserve and safeguard genetic biodiversity with emphasis in the conservation of native species.

4.4.2. Boost research, innovation and biotechnology adoption to address rural challenges and use biodiversity sustainably.

4.4.3. Apply scientific and transparent criteria to evaluate biotechnology permit requests.

4.4.4. Promote synergies between the public and private sectors as well as education and research institutions to develop and apply biotechnology tools.

4.4.5. Establish communication between the public and private sectors as well as education and research institutions to identify and address national biotechnology challenges.

4.4.6. Assure biotechnology crops and livestock safety to allow its use in harmony with other productive forms.

4.4.7. Grant licenses for biotechnology development to companies that meet legal requirements and guarantee responsible management.

4.4.8. Recognize the right of access to biotechnology, assuring produces capacity building in responsible practices and priority zones.

4.4.9. Incentivize the participation of the national productive sector in the development of the modern biotechnology industry.

4.4.10. Disseminate the challenges and potential of agri-food biotechnology by facilitating information and analysis to the Mexican society.

Tourism Sectoral Program 2013-2018

Objective 5. Foster the sustainable development of tourist destinations and scale up the economic and social benefits to host communities.

Strategy 5.1. Identify the vocation and potential of the natural and cultural capital through territorial tourist planning.

Lines of action:

5.1.1 Formulate, and implement the General Tourist Territorial Planning and consolidate a tourist policy align with national policy

5.1.2 Promote the coordination and implementation of regional and local tourist processes. 5.1.3 Formulate technical basis for decrees, regulations, supervision and management of Sustainable Tourism Development Zones.

5.1.4 Incorporate territorial tourist planning criteria in regulatory and legal instruments within the three levels of government

Strategy 5.2 Design instruments based on sustainability criteria to make the tourism sector a clean and climate resilient sector.

Lines of action:

5.2.1 Systematize and consolidate monitoring of tourist destinations with a sustainability approach.

5.2.2 Promote the integration of climate change mitigation and adaptation criteria in local tourist planning and policies. Promover la inclusión de criterios de adaptación y mitigación al cambio climático en la planeación y en las políticas turísticas locales.

5.2.3 Develop vulnerability assessments for the design of climate change adaptation programs and early warning systems.

5.2.4 Boost standardization of sustainability criteria to promote the implementation of best practices in the sector.

5.2.5 Develop a greenhouse gas inventory for the tourism sector to identify alternatives for emission reduction.

5.2.6 Strengthen climate change regional and international cooperation.

5.2.7 Promote schemes for energy and water efficiency, renewable energy use and responsible consumption in the industry.

Strategy 5.3 Strengthen conservation and sustainable use on national patrimony in the tourism industry

Lines of action:

5.3.1 Foment the efficient management of the national patrimony through collaboration of the tourism sector with other actors in charge of its management.

5.3.2 Promote the dissemination of the importance natural, historical and cultural patrimony of the country

5.3.3 Develop information and knowledge to promote tourism visits which are responsible and sensible with the value of the national patrimony

Strategy 5.4. Promote fair share of the economic and social benefits from tourism to host communities

Lines of action:

5.4.1 Foster participatory planning schemes and well as ownership and valuation of natural and cultural resources of tourist communities.

5.4.2 Increase the number and improve the quality of local employment in the sector.

5.4.3 Incentivize value chains of local and regional products and services for the industry.

5.4.6 Promote fare trade in the sector. Promover el comercio justo en el sector.

5.4.7 Incentivize social responsibility in the development of tourism activities.

Energy Sectoral Program 2013-2018

Objective 5 Increase the use of renewable and clean energy, promoting energy efficiency and environmental and social responsibility.

Strategy 5.1 Increase the participation of clean and renewable energies in electricity generation

Strategy 5.2 Promote sustainable use of energy in all processes and activities from exploration to consumption

Strategy 5.3 Increase **information mechanisms and media to promote renewable energy and energy efficiency**

Strategy 5.4 Implement environmental and social responsibility programs in the energy sector

Lines of action:

5.4.2 Implement the Climate Action Plan and Environmental Protection Strategy of Pemex.

5.4.3 Implement programs to reduce polluting emissions in the energy sector.

5.4.4 Establish research programs for the mitigation of greenhouse gas emissions through carbon capture and storage

5.4.5 Internalize climate change risk in the energy sector planning process.

ANNEX 12. GENETIC BIODIVERSITY KEY CROPS

The following crops are particularly relevant for diversity conservation owing to their economic and social importance and relationship to native habitats, and/or because Mexico and the Mesoamerican region are the center of origin: maize, beans, agave, coffee, honey, chicle, cacao, and the milpa and forestry systems. The crops discussed below use a management system that enables conservation of native vegetation areas and maintenance and restoration practices. Obtaining benefits from areas in good condition is an incentive to avoid introduction of intensive forms of land use that can lead to degradation or forest loss.

- **Maize.** Maize is an input for livestock production and for many industrial products. It is the most important crop from economic, political and social points of view. About 220 varieties of corn have been described in Latin America (Goodman and McK. Bird. 1977), of which 64 (29%) have been identified and described for Mexico (Anderson 1946, Wellhausen et al. 1951, Hernández and Alanís 1970, Ortega 1986, Sánchez 1989, Sánchez et al. 2000).
- **Beans.** Around 150 species of beans are known worldwide, including 50 found in Mexico with a variety of sizes, colors and ecological requirements. Beans ranked third in the area planted in Mexico in 2012 with 1,700,513 hectares and production of 1,080,856 tons. The main producing states are Zacatecas, Coahuila, Sinaloa, Durango, Nayarit and Chiapas.
- **Chili.** Mexico is the center of diversification and domestication of this species and has the largest distribution worldwide. There are more than 40 varieties of chili that are eaten fresh or dehydrated. In 2012 the crop was cultivated on 138,000 hectares, with production surpassing 2,379,735 tons.
- **Squash.** Native strains and varieties of pumpkins are grown in almost all agricultural regions of Mexico, accompanying maize and beans in the "milpa" agroecosystem. National statistics include the production of zucchini, with 436,947 tons produced in 2012. The main producing states are Sonora, Sinaloa, Puebla, Michoacán, Morelos, Hidalgo, Jalisco and Zacatecas.
- **Tomatoes.** Tomatoes are considered the second most important vegetable in the world after potatoes. Mexico ranks tenth as a global producer with approximately two million tons per year. The main producing states are Sinaloa, Baja California and Baja California Sur, San Luis Potosí and Michoacán.
- **Shade-grown coffee.** There are more than 280,000 coffee producers in Mexico, most of them indigenous people living in marginalized areas. More than 80% of production is for export. Tabasco and Chiapas are the largest domestic producers. Internationally, Mexico is one of the leading producers of certified organic coffee, whose worldwide demand has increased at an annual rate of 15% over the past decade. Mexico is extremely well positioned globally to promote high quality shade-grown coffee with biodiversity value.
- **Cacao.** Mexico occupies the eleventh place in world production with approximately 22,000 tons. The main producing states are Tabasco, Chiapas, Oaxaca, Guerrero and Veracruz.
- **Avocado.** Mexico is the largest avocado producer and exporter, with 1,316,104 tons produced in 2012. Avocados are produced in 28 states, but Michoacán leads the way.

In fact, the success of avocado exports has led to the transformation of a large area of natural ecosystems into avocado orchards. The economic success has had a negative ecological impact (decrease in environmental services and biodiversity, greater consumption and less water production, greater erosion and pollution, less carbon sequestration).

- **Agave.** Agave is distributed throughout Mexico from Sonora to Chiapas and from Nuevo León and Tamaulipas to Yucatan.
- **Honey.** Mexico produces 57,000 tons of honey per year and is the sixth largest producer worldwide. While half of production is consumed domestically, annual *per capita* consumption is around 300 grams, and Mexico continues to be the world's third largest exporter. There are approximately 40,000 beekeepers throughout the country, with more than 30% of production concentrated in Yucatan, Campeche and Quintana Roo. Mexico is the world's third largest exporter of organic honey, with 500 tons in 2009.
- **Vanilla.** Vanilla production in Mexico originates mainly in Veracruz, where the largest production for export is produced. The national land area used ranges from 1,400 to 1,900 hectares, and production is on the order of 360 to 600 tons.
- **Chicle/Chewing Gum.** In Mexico, 46 communities in the Campeche and eight in Quintana Roo produce about 450 tons. The states of Campeche and Quintana Roo are the main producers of certified organic chewing gum in Mexico, with most production exported to Italy, Japan, Korea and Singapore.
- **Amaranth.** The area planted to amaranth in 2012 was 3,336 hectares, with production of 4,278 tons. It is a highly nutritious crop with an expanding market. Amaranth is cultivated in the states of Guerrero, Mexico, Morelos, Tlaxcala, Puebla, Distrito Federal, Michoacán and Oaxaca.
- **Chia.** Mexico has more than 700 species of chia. Along with corn, beans and amaranth, it was part of the basic diet of ancient Mesoamerican cultures. The state of Jalisco is the largest producer of chia, which is exported to the US, Japan and Europe. It is a crop with high nutritional value and an expanding markets.

ANNEX 13. SUMMARY OF INTERVIEW RESULTS

Academia and Experts

	Interviewed Person and Organization: **Dr. Juan Carlos Perez, Unai Marcaido - ECOSUR** **Type: Expert / Academia**	
1.	Conservation priorities	Fishing communities, octopus and shrimp conservation
2.	Priority geographies	Gulf of Mexico, Campeche Region
3.	Threats	Shrimp fishing by trawls, over fishing of commercial species, disrespect to fishing closures
4.	Changes in past five years (+ and -)	Changes in the government regulatory body, lack of fishing permits, changes in the provision of diesel subsidies
5.	Key institutions (to be created or strengthened)	Creation of fishing cooperatives for octopus exports
6.	Key programs or initiatives	Incentives for conservation fishing; alternative fishing activities such as ecotourism; control of invasive species such as lionfish.
7.	Key examples on the ground	Field research Ecosur Campeche
8.	Collaboration platforms or initiatives	ECOSUR
9.	Enabling conditions	Scarcity generates conditions for collaboration and respect for prohibitions; in other cases, creates incentives for overfishing.
10.	Gaps (information gaps and intervention gaps)	Traceability of conservation fisheries, aquaculture studies and repopulation of marine species, fishermen's census, real governance on fishing areas, complementarity of subsidies between institutions
11.	Monitoring and evaluation tools, mechanisms or criteria	Fishing efforts per unit area
12.	Key practices (sustainable production and conservation practices)	Octopus fishing with stick, conservation fishing
13.	Recommendations for addressing threats	Aquaculture, economic options in times of fishing closures, close shrimp catch until fisheries recover.
14.	Additional documents or resources	

	Interviewed Person and Organization: **Dr. Juan Alayon – ECOSUR agrosilvopastoral** **Type: Expert / Academia**	
1.	Conservation priorities	Forest species with value in agrosilvopastoral production
2.	Priority geographies	Yucatan Peninsula
3.	Threats	Fire, overgrazing, invasive species, change in subsidies, Sembrando Vida program, Climate Changes, water availability, cattle mobility from Guatemala - animal health. Very long establishment times - more than 5 years, of the production process
4.	Changes in past five years (+ and -)	Fire, subsidies, local fattening systems sponsored by Sukarne for the Cancun market.
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	Santa Rosa silvopastoral company, silvopastoral production in

		successful peninsula regions
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	LICONSA, guarantee/targeted prices for dairy program
9.	Enabling conditions	Differentiated market prices, better prices for producers
10.	Gaps (information gaps and intervention gaps)	Economic studies on promising forest species, lack of genetic controls in local livestock, lack of studies of local meat markets.
11.	Monitoring and evaluation tools, mechanisms or criteria	Number of trees per hectare, number of animals per hectare
12.	Key practices (sustainable production and conservation practices)	Living fences, technologies using native species, recovery of genetics of animals brought from Spain in Colonial times.
13.	Recommendations for addressing threats	Modification and expansion of leucaena in different regions of the country.
14.	Additional documents or resources	

	Interviewed Person and Organization: **Juan Bezaury** **Type:** Expert	
1.	Conservation priorities	The current government has interest for rural development and well-being of communities but has a lack of understanding how and why sustainability is a key pillar for poverty alleviation. On the other hand, there is an area of opportunity if conservation efforts are developed at a local level, working in coordination with communities, with a social perspective and increased efficiency.
2.	Priority geographies	
3.	Threats	- Current government distrust in NGOs - *Sembrando Vida* is potentially a threat to conservation and biodiversity. - Budget cut for the environmental sector and lack of strategy and policy in this area represent a great challenge and threat for the near future.
4.	Changes in past five years (+ and -)	
5.	Key institutions (to be created or strengthened)	- Biocultural landscapes. Minister Victor Toledo published a paper on this. Yet, these are initiatives that cannot be achieved in a six-year period unless there are previous efforts in place. The most advanced processes are JIBIOPUUC and AMECA (five years). - The initiative in Congress to define legally what “landscapes” are can be discussed again. Landscapes can be defined legally as other model for rural development and conservation, another scale of conservation areas. Bottom-up approach working with society, economic actors and municipalities. Can be a mechanism to coordinate efforts and resources and it might derive in a zonification or land use plan, depending on the policy instruments that States or government promote. - Biodiversity Law Initiative at Congress.

		- Big NGOs can help coordinate strategically in the territory. Organizations such as OMOFOC or CCMSS are important actor son the ground for forest management and articulation of communities and production.
6.	Key programs or initiatives	
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	- SADER collaboration to include biodiversity
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	-
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- Show clearly the relationship between sustainable rural development and its role in migration. - Priority: Security
14.	Additional documents or resources	

	Interviewed Person and Organization: **Manolo Canto, THE NATURE CONSERVANCY** **Type: Expert**	
1.	Conservation priorities	
2.	Priority geographies	
3.	Threats	-

4.	Changes in past five years (+ and -)	-
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	There are two systems (which cannot be called platforms yet): a. SAMOF – Forestry Satellite Monitoring System. Post processing is done by state in CONAFOR. It is not yet National scale. It is at risk of being completed due to budget constraints. Now it is being completed for IRE states. Maps of activity and integration to be nested into the GHG inventories. If the process is not completed at a national scale, MRV REDD+ system is put at risk. b. Map 2015 national scale- MADMEX-ANTARES. Map of change 2018 will be done based on the exercise that was performed for Lacandona region. It is expensive but has a significant progress for covering nationwide. Product that is already free to access. The process that follows is having data on activities and emission factors and generating capacities at state level for getting feedback and nesting.
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	A priority will be to have relevant and similar data for the agricultural sector. Work with SIAP on this. Lack of coordination and agreement among governmental agencies regarding the systems.
11.	Monitoring and evaluation tools, mechanisms or criteria	

12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	-
14.	Additional documents or resources	

	Interviewed Person and Organization: **Andres Avila Akerberg, POLEA** **Type: NGO / Expert**	
1.	Conservation priorities	Environmental legislation in Mexico, biodiversity, climate change, forestry, agriculture
2.	Priority geographies	Mexico
3.	Threats	- A development paradigm that sets a logic of exploiting the environment as a means to grow economically - Expansion of the agricultural frontier, illegality in the forestry sector, climate change, lack of income at the state and municipal level, lack of goals (clear policy) in the environmental sector
4.	Changes in past five years (+ and -)	Budget cuts in the sector, lack of rules applied despite the existence of laws, proposal for environmental management not met in time
5.	Key institutions (to be created or strengthened)	PNUD, CONANP, GIZ, AMERIN, CENDLA, SHCP,
6.	Key programs or initiatives	
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	Legislators at congress
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	- Lack of budget in the sector - Subsidies contrary to biodiversity conservation - Excessive tax burden on the forestry sector, as well as high transaction costs (paperwork) - Problems of legality in the timber market - Illegal logging
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	Traceability of forest products and non-timber products in general, regulate the authorized endowments by forest species, governance in the community forestry sector
14.	Additional documents or resources	

Foundations / Private Sector

	Interviewed Person and Organization: **Concepción Molina, FUNDACIÓN SLIM** **Type: Foundation**	
1.	Conservation priorities	Conservation of marina and terrestrial biodiversity. - Water management (Ramsar, water reserves, etc.) - Climate change as a cross-cutting priority - Harmonization of public policies - Strengthening of civil society and communitarian leaderships - Education and marketing - Financial innovation- finance of rural societies and local communitarian businesses.
2.	Priority geographies	- Golfo de California - Chihuahua Desert - Mariposa Monarca - Mesoamerican Reef - Chiapas - Oaxaca
3.	Threats	- Current policies, such as *Sembrando Vida*. - Emerging issues such as Sargasso or gulf seaweed that need rapid responses and coordination - Lack of planning and involvement of stakeholders to address pressing conservation issues - Insecurity in rural areas and activities (e.g. Vaquita Marina) Challenges include: - Very low priority for environmental conservation in the current GOM - Lack if a common vision for sustainable development at GOM. Not clear what the strategy is for the environmental sector in the National Plan of Development (PND) -
4.	Changes in past five years (+ and -)	- There are success stories and progress but not at the pace that degradation and challenges are happening. Loss of forests and biodiversity exceed current level of effort.
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	Fundación Slim provided 50 million pesos for a 10 year program with 66 NGOs in 104 projects. WWF was the technical operator to oversee the legal, administrative, management of local implementation partners. Local and national NGOs work in alliances on the ground.
7.	Key examples on the ground	- Río Arronte. Capacity building mechanism done before NGOs present their proposals for funding. - Vizaíno- conservation of gray whale. Whale watching activities provide income from conservation of biodiversity.

		- Success factors for projects:
		  o Synergies between civil society, academia and communities
		  o Strengthening processes with a 3-5 year scope for funding
		  o Multiplying effect of matching funds, DIVERSIFICATION of financial sources
		  o Focalization: geographic and strategic lines of action to have more impact and results.
		  o DIVERSIFICATION of activities and sources of income in projects with communities and producers.
		- Restoration of Alto Golfo de California. Bilateral collaboration for water management in the Colorado River Delta (water treatment plants, run-offs, etc.). Fund raising from Mexican resources. The 323 Act pushed stakeholders to collaborate.

8.	Collaboration platforms or initiatives	- Much needed to ensure good outcomes. - For example, in NPA there is no involvement of Ministries, sectors or key stakeholders, while in Colorado River Delta there is involvement of key decision makers and local stakeholders (CONAGUA, Baja California Government, and Mexicali).
9.	Enabling conditions	- Include collaboration platforms into planning processes at a regional level. - Public goods: Security, infrastructure
10.	Gaps (information gaps and intervention gaps)	- Coordination of investments from donors by topic and region. There is a need for “brokers”, conveners or facilitators of collaborative processes. - Alliances and coalitions are needed but, due to a lack of conveners, the processes remain as documents or diagnostics of a situation. - Include collaboration platforms into planning processes at a regional level
11.	Monitoring and evaluation tools, mechanisms or criteria	Currently, Fundación Slim doesn’t have standardized metrics. They work with general lines of action, regions, activities and metrics, but lack indicators to measure impact. Indicators vary among the different projects. They plan to design better a second phase and call for projects in which they will define more strategic outcomes by: identification of key sites; prolonged efforts (5 years); identification of partners that have already participated with the program and have good performance; involvement of stakeholders.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- Clarify and communicate the costs associated with biodiversity loss. Reflect in national accounts. - Collaboration and strategic planning - Diversification of funding and activities - Evaluate innovative mechanisms. (e.g. payment for results)
14.	Additional documents or resources	

Foundations/Donors/international Agencies

	Interviewed Person and Organization: **Gisela Noble, FUNDACIÓN WALMART** **Type:** NGO	
1.	Conservation priorities	Improve the agricultural business ecosystem as a poverty reduction and food security strategy. Recognition as Walmart that: a) as a leading organization they have a transformational muscle in Mexico's rural environment; b) that small holder farmers have untapped potential and that the core business of Walmart should include them as part of a solution for poverty, food security as well as diversification for the company.
2.	Priority geographies	15 states for fruit and vegetable production Michoacán, Colima, Hidalgo, Puebla, CDMX, Morelos, Coahuila, Campeche, Veracruz, Yucatán, etc.
3.	Threats	Move more quickly to address the pressing challenges (population growth, poverty, insecurity, climate change).
4.	Changes in past five years (+ and -)	More awareness. Leaderships in some companies
5.	Key institutions (to be created or strengthened)	Collaboration platforms for scaling up the inclusion and development of true social responsibility. Walmart is inviting other companies as partners and participants into the imitative. The company needs to transform its operation, put some skin on the game, in order to minimize the negative impact of its operations and maximize its positive impact.
6.	Key programs or initiatives	- Increased productive and business skills for farmers farmer organizations - Increased capacity and more NGOs working for capacity building in the rural sector - Promotion of market linkages for small holder farmers. - Gender – Empowering women assisting them for the improvement of their small businesses - Donation of food to rural and communities in poverty
7.	Key examples on the ground	Near 5000 farmers have been trained to have improved productive practices and increase their yield. Also, to have negotiating and business capabilities for market integration.
8.	Collaboration platforms or initiatives	Working now with NGOs on the ground for capacity building and integration of SHF into value chains. Participation of other companies to scale up the initiative.
9.	Enabling conditions	Leadership. Talk to the human side of the key people working in the company. Designing programs and policies aligned for the company's operations, integrate them as part of the core business.
10.	Gaps (information gaps and intervention gaps)	- Consumer awareness regarding the value of small holder production

11.	Monitoring and evaluation tools, mechanisms or criteria	- Monitoring and evaluation of results at farmer level (productivity, market integration, revenue, people trained) - Currently performing an evaluation and ME&L exercise with CIDE. - Also, an analysis for integration of set of indicators for sustainability has been performed and will be evaluated for inclusion into the program's operation.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- Show results in terms of ROI, socially, environmentally, and also for the company. - Share stories of success.
14.	Additional documents or resources	

	Interviewed Person and Organization: **Ivana Fertziger, FORD FOUNDATION** **Type: Foundation**	
1.	Conservation priorities	Central topic is inequality (social, political, in all its dimensions). Work is related with two areas: - Natural resources and climate change - Transparency and impunity The main focus is on the distribution of costs and benefits of natural resource management and use. Mapping and analysis of social and environmental impacts of initiatives in the territory. Ford Foundation's hypothesis is that when communities manage their own resources, conservation is more effective, development is related with their vision of well-being and a coherent balance with culture and natural resources.
2.	Priority geographies	Brazil, Indonesia, Mexico and Central America Mexico and Central America are especially relevant due to their trajectory of communitarian forest management. Emblematic territories: a. Campeche Hopelchen and in General de Yucatan Peninsula b. Sierra Norte de Puebla- Indigenous movements with a long history of resistance to projects that affect their territory. Mechanisms used by them are land use plans, assemblies, etc.
3.	Threats	Although deforestation rates diminished greatly in past years, the last 3 to 4 years a spike in deforestation can be seen as well as alteration of habitats. - Tren Maya – Land speculation - Solar parks & wind power - Agriculture for grain production that supplies In Mexico the GOM has given concessions for infrastructure and industrial exploitation particularly for mining, which are still in exploration phases. There is

		opportunity to include and negotiate ex-ante the mechanisms for sharing benefits & costs derived from projects. - A dynamic of promotion of mega projects with profound implications for communities and natural resources. Systemically communities are being excluded from the discussion of cost and benefit sharing. The model of large-scale projects (industrial agriculture, renewable energies, mining are now being implemented with division and exclusion of communities. - Pacts between these large-scale development projects with government officials, organized crime. - Criminalization and persecution of communitarian and natural resources defendants /activists.
4.	Changes in past five years (+ and -)	The model of large-scale projects (industrial agriculture, renewable energies, mining) The current Federal GOM has set a message to stop harassment to environmental and communitarian defendants or activists. Still harassment continues from other sources (industries, crime, and ex-public servants).
5.	Key institutions (to be created or strengthened)	Organization and inclusion of communities in the projects that touch on their territories and affect their development.
6.	Key programs or initiatives	- Ford Foundation is working in a communitarian territory management strategy (territory defined as physical landscape + culture + social and economic dynamics) to ensure the effective participation of communities in the decisions that touches their well-being. Avoid replication of current inequalities. - Ford Foundation is part of the Climate Land Use Alliance (CLUA) that gathers a set of objectives for climate change mitigation. - Ford Foundation works to promote research journalism (see next question). - Support to NGO at national level (for legal processes, analysis, public policy incidence, organization)
7.	Key examples on the ground	Mining project in Sierra de Puebla. A legal process against nine communitarian leaders. Violence and criminalization of activists is a critical issue and is mainly related to large infrastructure projects that have been promoted from and/or in collaboration with the GOM, with private companies. Ford Foundation works to promote research journalism, to promote that the topic is rigorously covered and is being communicated.
8.	Collaboration platforms or initiatives	- CLUA platform. Alignment with other institutions or donors has been done with the World Bank in the past. - Also, participation in Group of Donors for Defense of Territory. With intermittent participation of the Interamerican Foundation Ford Foundation is exploring collaborations with JIBIOPUUC and AMUSUR through CLUA. Incipient dialogue with Jalisco (intermunicipal juntas, strong leadership in the Ministry of Environment).
9.	Enabling conditions	- Paradigm shift is needed to see development as the inclusion of local solutions. Dialogue with communities as a central piece. - For example, a vision of pure conservation where human presence is a threat has led to areas great conservation challenges (e.g. NPA)

10.	Gaps (information gaps and intervention gaps)	- A great challenge is the magnitude of the problem. Transnational companies have an operative logic and communities are not being included. - Understand better the relationships with organized crime, although is a topic with huge complexities. - Reinforce positive narratives of landscape/territories management. - Energetic transition into renewable energies – Is very important, but must be well developed to be congruent with communities and natural resources.
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- Local leaderships such as in JIBIOPUUC are invaluable assets. - Paradigm shift from conservation to effective and inclusive management of natural resources. - Address overregulation in forestry communities. Provide correct incentives from regulation and policy for sustainable forest management.
14.	Additional documents or resources	- Proyecto Poder – Sierra Norte de Puebla. https://www.projectpoder.org/es/2014/06/extractive-industries-in-the-sierra-norte-de-puebla/ - Fundar: Anuario de industrias extractivas. https://fundar.org.mx/anuario-2017-las-actividades-extractivas-en-mexico-mineria-e-hidrocarburos-hacia-el-fin-del-sexenio/

	Interviewed Person and Organization: Gerardo Arroyo, Director de Desarrollo Sustentable y Daniela Torres, Directora de la iniciativa BIOFIN, United Nations Development Program (UNDP) **Type: Intl Development Agency**	
1.	Conservation priorities	- Biodiversity - Climate change - Resilience - Development
2.	Priority geographies	- All the country depending on the project
3.	Threats	- Expansion of agriculture frontier - Investment on unsustainable productive activities with low productivity - Lack of integration of biodiversity into productive sectors
4.	Changes in past five years (+ and -)	- Expenditure in Biodiversity went from MX$ 6 to MX$20 billion between 2006 and but experienced a decrease in 2014 which places it at 0.9% GDP, lower to other Latin American Countries
5.	Key institutions (to be created or strengthened)	-
6.	Key programs or initiatives	- Portfolio of 80 million dollars in Mexico from which 8-9 million are forest and biodiversity projects - Multilateral funds: Global Environmental Facility and Montreal Protocol

		- Bilateral funds: Canada, European Union, Norway, Germany (IKI) - Country program 2020-2026 - UNDAF: Development Assistance Framework - Key topics for the next 5 years: Climate change and green economy. Biodiversity and forest will fall under this framework - Energy and environment - Resilience ate the community level - Value chains - Mainstreaming of Sustainable Development Goals (SDGs) through private sector participation. - Biofin: public policies coordination and realignment, public finance, biodiversity financing gap
7.	Key examples on the ground	- San Nicolas Totoloapan: forest conservation and promotion of ecosystem services
8.	Collaboration platforms or initiatives	- Private Sector - Global Environmental Facility - CONAFOR, CONANP, - SADER - Secretaría del Bienestar - Biodiversity Financing Task Force: Private financing institutions, green fund, SOFOLES, SOFOMOS
9.	Enabling conditions	-
10.	Gaps (information gaps and intervention gaps)	- Education and capacity for natural resource management - Financing, especially from banks - Bioeconomy: marketing strategies - Traceability - Incidence in cross-sectoral public policy of conservation and sustainability initiatives (e.g. UMAS) - Participation of private sector, especially small and medium enterprises - Scale of operations and markets transit from niche to mainstream - Lack of coordination of conservation subsidies (e.g. PROCODES, Forest Fond and SADER´s programs) - Biodiversity financing GAP amounts to 8,000 million dollars in addition to the 14,000 already spent
11.	Monitoring and evaluation tools, mechanisms or criteria	- Corporate annual report with performance indicators - Policy quality assurance - ROAR: Results based framework for reporting
12.	Key practices (sustainable production and conservation practices)	- Timber and non-timber forest products
13.	Recommendations for addressing threats	- Diversify financial products: complement subsidies with soft loans and carbon markets in the forest sector. Take advantage of markets in the framework of the climate action reserve. - Diversify community income - Strengthen value chains - Scale up and innovate financial resources: PES, Charges for NPA,
14.	Additional documents or resources	

	Interviewed Person and Organization: **Jasmin Hundorf, GIZ** **Type: International Agencies/Donor**	
1.	Conservation priorities	1. Mainstreaming – Link social, communitarian development with ecosystems and ecosystem services. Considering that people with greater marginalization depend more on ecosystems. Visualize the need to ensure food security, access to water, etc. 2. Finance = NPA. By visualizing the ecosystems approach, seek to channel public and private funding. For businesses, it is a matter of risks, supply, etc. They work with the ecosystem approach. Nature has an intimate value but more than that. GIZ works with a systemic approach. Nature has a value in itself but also provides great benefits and services to society.
2.	Priority geographies	There is no project with a specific focus on forests. 4 bilateral projects in Mexico: 1. Integration of biodiversity in Mexican agriculture. GIZ works with SEDER for a component of Ecosystem economics. A collaboration between several institutions. Qualitative and quantitative evaluation of ecosystem services. Could be that the results can inform *Sembrando Vida*. By 2021, pilot projects will be implemented in Oaxaca (sustainable livestock), Yucatan (MIAF) and Guanajuato. (Maiz Criollo) with SHF. Also MIAF, control of soil erosion and sustainable livestock. 2. Three territorial projects - integral landscape management. - Sierra Madre Oriental (Veracruz, Puebla, Hidalgo, Qro,). Continuity for CESMO project. Federal counterpart is CONANP- 3. COBEN 2- Neovolcanic axis. Outside CDMX. Important component of mountain livestock (IICA, Mexican Fund). ANP private sector cooperation with a vision of connectivity. 4. Selva Maya- Yucatan Peninsula, Belize and Guatemala. CONABIO participates in monitoring and work with communities to improve revenues based on ecosystem services. They also have offices on these sites.
3.	Threats	In line with the latest IPES report: - Agricultural sector - Urbanization - Poverty and inequality. Without improving the life of the most marginalized population, the environment cannot be preserved nor managed sustainably.
4.	Changes in past five years (+ and -)	In Mexico there is a lot of awareness regarding natural resources agenda and issues. Advances in the SADER - From COP 13, monitoring between sectors. There was no impulse at the beginning. Now in the SADER (Underministry of Agriculture) biodiversity and climate change is cross-cutting.
5.	Key institutions (to be created or strengthened)	.
6.	Key programs or initiatives	GIZ works by clusters - 5 programs: governance, sustainable energy, city management, Climate Change, natural resources and biodiversity.

		Climate Change works in adaptation; program on “Cities” is linked to ecosystem services.
		
		The Biodiversity and Natural Resources cluster is the basis for addressing the rest of the SDGs. This is how they see it in GIZ.
		In the Biodiversity and Natural Resources cluster, relevant activities include:
		
		- IKI IBA- Follow-up for the reference map / agricultural frontier map to advance the agenda for deforestation free policies in agriculture.
		- Biodiversity Integration Center - Biofin, UNDP, WRI. Hosted in SADER. Biodiversity and CC mainstreaming in the SADER - an institutionalized hub within the SADER. CONABIO is part of the steering committee.
		- Metrics –
		  o Improvement of management effectiveness in NPA. Community income improvement, change in public policies - planning, incentives, etc.
		  o System of indicators by project and by project.
		- Value links - Tuna / coffee / vanilla training.
		
		They facilitate exchanges and dialogue between institutions

7.	Key examples on the ground	-
8.	Collaboration platforms or initiatives	- Biodiversity Integration Center – - Integrated Landscape Management projects are based on cooperation. - TEEP Agrodiversity- food project. Collaboration with MASAGRO-CIMMYT.
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	- Overlap between institutions and donors - Training, capacity building and diagnostics and studies. - Funding is 3-5 years and development processes take much longer to be effective. They select initiatives that already exists and specifically address what is needed. The challenge is balance of opportunities at the local level to generate changes but, on the other hand, see the public policy framework and private initiative.
11.	Monitoring and evaluation tools, mechanisms or criteria	They are working on a frame of reference for landscape approach. Principles of landscape for commodities. It could involve PES.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	.

14.	Additional documents or resources	

	Interviewed Person and Organization: **Sébastien Proust PPD-GEF** **Type: Donor**	
1.	Conservation priorities	Priorities: 60% biodiversity conservation; 30% climate change; 10% restoration of soils. An investment of MX$ 4.6 million for three years-Small grants to support local communities in the southeast, community projects for development of local solutions. 1. Generate a baseline of the current state of organization and structure of civil society organizations and community businesses in the Yucatan Peninsula. 2. Identify the degree of effective action in the tasks of conservation of peninsular ecosystems, directed by the productive activities of organizations. 3. Design a network of interactions of the organizations identified, by distinguishing key stakeholders in different productive sectors, as well as the effectiveness of collaborations.
2.	Priority geographies	Yucatán, Campeche y Quintana Roo PPD has been 25 years in the area.
3.	Threats	Although, we have not documented a clear pattern, if we can anticipate that the degree of institutional governance is the most important element of success in productive activities, and they also allow conservation tasks to be carried out more effectively. Likewise, the institutional framework (consolidation structure of organizations) is an indicator of commitment and "loyalty" for the conservation tasks associated with its main activities. Therefore, a low degree of organization could be understood as a threat to the conservation task.
4.	Changes in past five years (+ and -)	From official data, a tendency to increase conservation area, in terms of surface rather than by quality conservation. However, despite efforts, the goals are not achieved. In the region (Southeast Mexico), and specifically in the last year, there were two forest fires of historical consequences: devastation of areas in Los Petenes and Sian Ka'an, which undoubtedly represent one of the most important setbacks in recent decades. At the local level, a positive impetus in community conservation is shown, particularly in this region. However, other phenomena such land use change for new conventional tourist complexes and the dynamics of deforestation and transformation to ultra-productive agricultural fields, can bring the conservation balance to a neutral position, or probably to negative numbers. A significant change is the positive attitude towards conservation shown by organized groups at ejido level.
5.	Key institutions (to be created or strengthened)	1. Cooperative Society Los Aluxes. They are an example of success in the case of the cooperative societies of the state of Quintana Roo, in the field of ecological tourism and community experiences. Foreign tourism, primarily from Europe, which have evolved, neglecting landscape adventure tourism, and demanding tourism from experiences in Mayan communities. Ejidos in the municipality of Felipe Carrillo Puerto see the benefit of maintaining traditional Mayan practices. Likewise, knowledge and appropriation of the landscape diversity of the region have been reinforced. Through agricultural

		practices of low environmental impact and good management, the use of local native seeds, family agriculture and agroecological practices, beekeeping and organic production regimes are encouraged. In the ejido of Muyil, this has reinforced a sense of belonging and knowledge of the territory, helping to lay foundations of governance and differentiation by logos of reef, margrave and jungle conservation in a transversal way. Therefore, this type of tourism represents an exemplary case of success in terms of biodiversity conservation. 2. Kabi Habin cooperative dedicated to the production of organic honey. This organization strives to have good practices of organic production, incorporating non-invasive agricultural practices, reducing chemical inputs especially herbicides and pesticides. What is truely important is the integration of the ejidatarios to the cooperative with a series of conservation commitments: 1) to carry out agro-apicultural practices with an imperative ethic, that is, to promote conservation of particular species that enrich the flavors of honey; 2) the decrease in agricultural and forestry practices that compromise the quality of their product, and 3) all ejidatarios are compeled to register before their assembly an area of two hectares for forest conservation, including new applicants that want to be part of the organization.

6.	Key programs or initiatives	Terrestrial:
		- Agrobiodiversity. Native seeds, agroecological practices. Restoration.
		- Apiculture- Each apiary can conserve 80 hectares of jungle or mosaic. Honey is a source of diversification. A priority is to achieve certification for the US market.
		- Community forest management - Ensure sustainable practices:
		  o Creation or modification of sustainable forest management plans that allow increasing the area under community forest management.
		  o Certify or maintain the certification of timber forest production in ejidos or community custody chains (FSC or NMX 143).
		  o Strategies to increase income of ejido companies or forestry ejidos and the distribution of benefits with a gender perspective in the timber and non-timber forest landscape of the PPD.
		  o Capacity building for the production and commercialization of non-timber products in Management Units for Wildlife Conservation (UMA), Areas Voluntarily Dedicated to Conservation and community conservation areas.
		  o Strengthening of commercial networks and circular economy strategies of certified forest products, both timber and non-timber.
		  o Establishment or strengthening of alternative tourism circuits or networks that sustainably take advantage of the forest landscape.
		  o Sale in roll or boards. Boost industrialization for finished product.
		- Silvopastoral systems
		- Control of roya for coffee and monilia in cocoa. Is a way to start working with communities. Value chain approach to maximize revenue. Cocoa entrepreneurship of women to sell finished chocolate
		
		Fisheries:
		- Tabasco and Chiapas focused on devil fish control.
		- Manatee (small project)
		- Fishing –Lobster exports to Japan as well as locally.

		- Fishing high coyotaje. No value chain. Cross-cutting projects: - Continuous strengthening of the capacities of grassroots organizations and civil society in the PPD community in terms of gender equality and inclusion of young people in sustainable production processes. - Generation of management capacities of community businesses, with a value chain approach, updating in fiscal matters and establishment of administrative systems. - Strengthening of organizations of producers and regional alliances to promote the scaling up of sustainable practices. Creation of innovative public policies, the implementation of capacity-building schemes at the regional level, including transfer of successful experiences between regions, and the integration of regional value chains for the sustainable management of natural resources in the five target landscapes. - Advice to grassroots groups for the implementation of small-scale projects for water pumping and the generation of energy necessary for sustainable productive activities using renewable energy. - Dissemination of the actions of the communities in their actions for the sustainable management of biodiversity. Training of local and national communicators and journalists on the actions of the communities. - Dissemination with innovative methodologies of state conservation strategies and sustainable use of biodiversity of the 5 states of the PPD landscapes.
7.	Key examples on the ground	For more details see: http://ppd.org.mx/c2019/
8.	Collaboration platforms or initiatives	PNUD, FAO, GIZ, TNC, RFA 25 years of experience working with directing resources into communities, match funds, co-investments with public funds or programs.
9.	Enabling conditions	When analyzed from a perspective of nested institutions, PPD and UNDP help mainstreaming the UN sustainable development into sub-national organizations. In local experience, most community-based organizations, or community companies, have a key element of environmental conservation or of specific resources aimed at the productive effectiveness of their activity.
10.	Gaps (information gaps and intervention gaps)	- Benchmarking between successful projects and failed projects - - Development of governance processes - How to measure the level of participation at different stages, processes - Understanding of circular economy, local markets and short supply chains
11.	Monitoring and evaluation tools, mechanisms or criteria	Metrics based on GEF. Hectares / area GHG avoided Hectares restored Livelihoods - people Number of people with better communitarian management skills
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for	- Creation of collaborative ties and interactions with similar organizations

	addressing threats	- Knowledge sharing regarding best practices. - Define, in personal communication, what are the objectives and scope of potential financing, to avoid high expectations or confusion in the operation. - Generate a system of rules that allow cooperative members to obtain value and incentives for good practices in forest conservation. - Raise awareness among ejido assemblies about the advantages of technical assistance of certified experts in conservation and production, to help integration into value chains. - Professionalization of local human resources - Facilitation of collaboration platforms – a key element for success
14.	Additional documents or resources	https://www.youtube.com/watch?time_continue=5&v=9xQnywvDtww

	Interviewed Person and Organization: **Karla Barckley, Coordinadora Encargada de Proyectos de Biodiversidad y Desarrollo Rural, AFD** **Type: Intl Development Agency**	
1.	Conservation priorities	- Biodiversity and ecosystem conservation - Sustainable development - Community engagement
2.	Priority geographies	Jalisco, Chiapas, Chihuahua,
3.	Threats	- Land use change - Illegal extraction of biodiversity resources -
4.	Changes in past five years (+ and -)	- Strengthening of long-term governance structures for territorial planning
5.	Key institutions (to be created or strengthened)	- In 2016 the Biocultural landscape model was discussed in Mexico´s Senate and a minute was drafted for its approval
6.	Key programs or initiatives	- Climate change, Public Policy Loan with additional grant funds (300,000 euros): governance and territorial planning - Life 2000: Local agendas for sustainable forest management and climate change - Biocultural landscape: 2 million euros to develop a territorial planning model based on regional natural parks of France - Bioconect: 300, 000 euros invested in connectivity in biological corridors including support for the TPS project preparation.
7.	Key examples on the ground	- Inter-municipality agreements (Juntas intermunicipales): transfer of 30,000 pesos to finance the technical capacity of the juntas. Agreements are signed by the state and municipal governments
8.	Collaboration platforms or initiatives	- CONAFOR - SADER - CONANP - State governments of Jalisco, Quintana Roo, Yucatán and Campeche
9.	Enabling conditions	-
10.	Gaps (information gaps and intervention gaps)	- Capacity building of local actors - Financing of sustainable practices
11.	Monitoring and evaluation tools,	- Project evaluation criteria established by AFD

	mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	- Sustainable forest and solid waste management - Single attention windows for requesting subsidies of SADER and CONAFOR - Certification, geographic indications and local seal - Biodiversity conservation in the framework on local sustainable development (e.g. Mascota community) - Connectivity policies: alignment of public policy instruments in a territory to foster buffer zones and sustainable practices, - Institutional strengthening - ADVCs - Sustainable fishing practices and ocean conservation - Agrobiodiversity and agroecology practices - Food Security
13.	Recommendations for addressing threats	- Improving governance through long term institutional arrangements - Working at the local level an empowering local stakeholder - Planning regional development based on landscape models - Developing and strengthening local markets
14.	Additional documents or resources	

	Interviewed Person and Organization: **Khatarina Sinegman, WORLD BANK** **Type: Intl Development Agency**	
1.	Conservation priorities	Biodiversity conservation at country level, in particular, tropical forests and the incidence in the fight against poverty in Mexico
2.	Priority geographies	All the country
3.	Threats	Water scarcity, effects of climate change, loss of biodiversity, forest, poverty and gender in the environmental context
4.	Changes in past five years (+ and -)	Change in the budgets of the environmental sector including the forest area, adjustments of the water sector among others, an unfavorable international context for the economic development of the country.
5.	Key institutions (to be created or strengthened)	Secretary of Finance and Public Credit, COLMEX Academic Units, coordination with CONAFOR
6.	Key programs or initiatives	PROFOEM: http://projects.worldbank.org/P164661?lang=en PSA • **Women entrepreneurship:** It was published in El Pais in Spanish (el enlace a la nota ya publicada) and both in English and Spanish on the Bank website • **Migration:** http://www.bancomundial.org/es/news/feature/2016/08/31/reverse-migration-furniture-forests-oaxaca • **Women & Forest:** This was the video for the launch of the Forest Action Plan: https://www.youtube.com/watch?v=DIil_RLaGsQ
7.	Key examples on the ground	The World Bank adjusts its actions to the request of the Government and the SHCP
8.	Collaboration platforms or initiatives	SHCP, CONABIO; SEMARNAT; CONAFOR, GEF
9.	Enabling conditions	Adequate and applicable legal framework in the current Mexican context

10	Gaps (information gaps and intervention gaps)	Application of the rules of operation on which donations and loans are made to the Mexican Government
11	Monitoring and evaluation tools, mechanisms or criteria	https://www.bancomundial.org/es/region/lac/projects/evaluation The evaluation depends on each type of project in the link you see the typology of the process
12	Key practices (sustainable production and conservation practices)	Direct support to government plans
13	Recommendations for addressing threats	Poverty management and its repercussions with the environment.
14	Additional documents or resources	1. PROFOEM: http://projects.worldbank.org/P164661?lang=en 2. ICR Forest and Climate Change (http://documents.worldbank.org/curated/en/132941537212873195/pdf/ICR00004321-08282018.pdf), and independent evaluation of the ICR (http://documents.worldbank.org/curated/en/860551543249938935/pdf/Mexico-MX-Forests-and-Climate-Change-SIL.pdf). 3. Country Evaluation Mexico (includes Environment and Forestry): http://documents.worldbank.org/curated/en/588351544812277321/Mexico-Systematic-Country-Diagnostic 4. Spanish Forest note can be found here: http://documents.worldbank.org/curated/en/639041556249435926/United-Mexican-States-Programmatic-Forest-Country-Note 5. Gender Study English and Spanish: http://documents.worldbank.org/curated/en/285991554966053556/Closing-the-Gender-Gap-in-Natural-Resource-Management-Programs-in-Mexico 6. Closure Video of Forest and Climate Change by the previous Government : **English** https://youtu.be/XAnjZxCxkEc **Español** https://www.youtube.com/watch?v=UiG0ycVh59c&t=36s Other nice videos related to WB projects: • **Women entrepreneurship:** It was published in El Pais in Spanish (el enlace a la nota ya publicada) and both in English and Spanish on the Bank website • **Migration:** http://www.bancomundial.org/es/news/feature/2016/08/31/reverse-migration-furniture-forests-oaxaca • **Women & Forest:** This was the video for the launch of the Forest Action Plan: https://www.youtube.com/watch?v=DIil_RLaGsQ 7. PSA materials (evaluation) attached and contact details of my colleagues at WB: Stefano P. Pagiola spagiola@worldbank.org Victor Hugo Orozco Olvera vorozco@worldbank.org

Private Sector

	Interviewed Person and Organization: **Kristina Diaz, PROTEAK** **Type: Private Sector**	
1.	Conservation priorities	Forest management, FSC, Certification
2.	Priority geographies	Nayarit, Tabasco
3.	Threats	- Illegality in the timber market, - Bad productive practices in the sector - Distortions by illegal entry of timber and fibers from the Chinese and Brazilian markets, - Lack of traceability in the timber market
4.	Changes in past five years (+ and -)	Lack of clear sector policies, change in the rules of operation of the sector
5.	Key institutions (to be created or strengthened)	AMEBIN, CSSM, SEMARNAT, BIMBO, REDD+
6.	Key programs or initiatives	Carbon funds, FIRA
7.	Key examples on the ground	Business for nature, PES
8.	Collaboration platforms or initiatives	AMEBIN, Corsia (Compensación de carbono y el Plan de Reducción de la aviación internacional), (market of compensation of CO2 - Mexico), UJAT, Universidad Autónoma Chapingo
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	- Creation of a national biodiversity Roundtable - Understanding biodiversity and natural capital as cross-cutting element in laws, rules of operation of government and private sector programs
11.	Monitoring and evaluation tools, mechanisms or criteria	Annual forest inventory
12.	Key practices (sustainable production and conservation practices)	Mulching and protection of soil
13.	Recommendations for addressing threats	Rules of operation of the sector, new sources of financing, better markets for Carbon
14.	Additional documents or resources	http://iki-alliance.mx/wp-content/uploads/3.3-Compensaciones-de-emisiones.pdf

	Interviewed Person and Organization: **Timothee Murillo, DANONE** **Type: Private Sector**	
1.	Conservation priorities	1. Regenerate soil, conserve water, biodiversity, forests and landscapes. Danone recognizes the relationship of the company with agriculture and the ecosystem services needed to continue in operation in a healthy environment. 2. Social regeneration. Work with small holder farmers (SHF) to articulate supply chains and improve well-being. Include young population and women that remain in rural areas in agriculture.
2.	Priority geographies	- Jalisco - Michoacán - Estado de México - Puebla

		For example, Mexico provides 35% of strawberry for Danone's global operations. They require 1000,000 liters of milk daily. Danone wants to diversity its dependency on a few big suppliers, by working with SHF.
3.	Threats	- SHF with conventional practices that are inefficient- inefficient use of inputs and resources with associated costs. Danone works in improving practices, quality and profitability. - Use of pesticides and synthetic inputs. - Demand (market) – Respond to more regulation and consumer's demands. Transparency in the supply chain - Connection with the market- Logistics. Optimize costs with SHF as suppliers. - Retention and loyalty with farmers by promoting win-win situations. - Access to finance, especially for SHF. Lack of trust from SHF in the banking system. High interest rates. Danone is acting as an intermediary and provides certainty through the commercial relationship with farmers. Financial scale remains a great challenge for Danone.
4.	Changes in past five years (+ and -)	Climate change impact, particularly for ranching. Rainfall, drought, plagues, etc. Danone is testing and sharing innovations in demonstrative productive units.
5.	Key institutions (to be created or strengthened)	Infrastructure, Loyalty with farmers, Incentives as simple as providing Diplomas and recognition to SHF participating in best practices.
6.	Key programs or initiatives	- They work in long term relationships with suppliers: o Either with direct contract when they have enough scale; o By aggregating SHF for achieving economies of scale and providing them training. o Danone Ecosystem Fund- provides a guarantee. - Social innovation: Health through food (profitable for the company and socially viable). Improved practices mean better products for consumers, improved well-being for people that work in the field and a differentiation by quality for Danone.
7.	Key examples on the ground	- Models with profitability for the business. Diversification with SHF represents 5% cheaper than buying directly from big suppliers. Elimination of intermediaries. (Proyecto Margaritas – Jalisco Dairy)
8.	Collaboration platforms or initiatives	- NGOs: o Technoserve o Nuup – for digital technologies for risk mitigation o Rainforest Alliance. - Academia o UNAM for models in the field. - Companies o Bimbo - International agencies o GIZ o BID o AFD - Interest in potential collaboration with USAID-DCA office.
9.	Enabling conditions	* The company has understood that social and environmental sustainability is part of the core business. For example, it launched Ecosystem Fund 10 years ago in a context of financial crisis with 100 million euros to transform their operative model.
10.	Gaps (information	Quantify and evidence the relationship with biodiversity.

	gaps and intervention gaps)	
11.	Monitoring and evaluation tools, mechanisms or criteria	Danone monitors and has a standard to measure organic matter, evolution of erosion, water quality, etc. Pledge regarding topics such as regenerative agriculture.
12.	Key practices (sustainable production and conservation practices)	Regenerative agriculture Set connectivity spaces and pollination areas. Intercropping. Avoid single crops. Shade trees.
13.	Recommendations for addressing threats	- Quantify and evidence the relationship with biodiversity – it is not clear for companies. - Explore innovative mechanisms for finance and value chain integration for sustainable SHF (working currently with BID-LAB) - Work with differentiation – group of farmers with different qualities/practices and achieve scale through partnerships/complementary operations with other buyers (e.g. Bimbo is currently working with Danone – buying at different times in the year)
14.	Additional documents or resources	

	Interviewed Person and Organization: Gustavo Pérez Berlanga , TOKS **Type: Private Sector**	
1.	Conservation priorities	1. Energy (90% of their energy comes from renewable sources) 2. Corporative volunteering for reforestation (Bosque Toks – an area of reforestation in Mexico City) 3. Water footprint program for the company. Priorities for their projects include: - Social reinsertion - Organization and inclusion of small producers into their stores as suppliers - Regarding sustainable practices, Toks has not defined specific improved practices in agriculture
2.	Priority geographies	They don't have clear priority regions. Intervention depends on commodities and communities that need support.
3.	Threats	- For agricultural production: climate change. For some crops, climate change impacts prices and lead to under supply.
4.	Changes in past five years (+ and -)	- Worsening conditions of poverty and marginalization in the country - Consumers with more sensitivity to sustainability and social responsibility topics.
5.	Key institutions (to be created or	"There is no successful company in a failed society"

	strengthened)	
6.	Key programs or initiatives	- Social reinsertion of young people that have been in jail. Project to provide skills and working experience for reinsertion into society – Run with USAID funding (Tijuana and Tuxtla Gutierrez) - Small holder and community integration into supply for Tok's restaurants. - Fondo Verde – They sell Tok's residues and use the money to support social security for their employees.
7.	Key examples on the ground	Their interventions in the field have been success cases and can be scaled up. Example: - Takaná project for coffee, indigenous communities. - Strawberry jelly project: Women started selling 10 kg a week and now are selling five tons to provide Tok's restaurants. Other companies doing interesting initiatives: Biopapel, Xcaret, CEMEX, ADO, CMR.
8.	Collaboration platforms or initiatives	All their projects are run through partnerships (NGOs, international organizations) Much needed collaborations for the implementation of projects: Government at a local level operation, companies.
9.	Enabling conditions	

10.	Gaps (information gaps and intervention gaps)	- Private sector involvement in social and environmental commitments is very scarce. The conditions that have enabled Toks to do committed Corporate Social Responsibility are:
		  o Commitment at high level of the company, from the CEO.
		  o A committed team that operates programs
		  o Resilience
		  o Incorporate projects according to core business and priorities in the firm
		  o Learning capacity and resilience
		
		- The GOM is not promoting any strategy.
		- No continuity in funding (long term)

11.	Monitoring and evaluation tools, mechanisms or criteria	They don't have a clear standard for improved practices. They work with Rainforest Alliance in some projects and therefore use RA standards there.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	Collaboration. Donors such as USAID has the strength to maintain processes through time and foster collaborations with the private sector.

14.	Additional documents or resources	https://colombia.corresponsables.com/actualidad/21-errores-empresariales-rsc

Government

	Interviewed Person and Organization: **Jorge Fernández, Mauricio Mendoza Briseño, CONAFOR** **Type:** GOM	
1.	Conservation priorities	1. Strengthen community and small holder governance platforms and capacities. Work in a process of empowerment for the ownership of natural resources management. This implies a recognition that forests are inhabited and are owned by communities, small holders and ejidos. This line of action is a priority for the current government. 2. Incorporation of communitarian forest management into areas under forest management and PES. 3. Stop processes of deforestation and degradation by addressing drivers of deforestation (illegal logging; agriculture; forest fires). Work with SADER to Foster deforestation free value chains (avocado, palm oil, ranching and soy)
2.	Priority geographies	- Areas with more potential for sustainable forest management as well as challenges: Yucatan Peninsula, Chiapas, Guerrero, Jalisco and Michoacán. 32% of deforestation happens in 5 IRE regions (Jalisco, Chiapas and Yucatan Peninsula) - Areas with more deforestation and degradation: Puebla, Hidalgo, Estado de México, Chihuahua
3.	Threats	1. Lack of coordination and an effective implementation of conservation projects and policies. 2. Drivers of deforestation and degradation of ecosystems: a. Illegal logging (legal production accounts for 30% of timber; 70% are imports and illegal logging) b. Forest fires c. Land use change for agricultural uses
4.	Changes in past five years (+ and -)	It is a challenge to maintain an agenda in the current environment. Increasing competition for development funds. SHCP has more regulation that means more complexity for administration and extra costs for NGOs. Small local NGOs are more vulnerable and are more likely to disappear.
5.	Key institutions (to be created or strengthened)	1. Work with local governments. Learn from REDD+ process in Mexico. 2. Strengthen institutional arrangements at different levels (intermunicipal associations, REDD+ agents of landscape development (APDT), etc.) to articulate policies and institutions more effectively. Develop a menu of alternatives for institutional arrangements (APDT, juntas, NGOs, etc.) 3. Promote governmental offices at a local level.
6.	Key programs or initiatives	1. Strengthening of communities and ejidos 2. PES 3. Restoration of watersheds 4. Other ongoing programs: control of fires, plagues and diseases. Regarding continuation of the REDD+ mechanism: - Implementation of IRE - Build an MRV system and capacities in the states - By the end of 2019 a map of deforestation 1:75,000 with 86% exactitude will be ready.

		- Achieve coordination with SADER for landscape management - Carbon markets
7.	Key examples on the ground	JIBIOPUUC – Intermunicipal Association in Puuc Region. PROCIMAF- lessons learned regarding the need of building capacities and supporting the processes, not only increasing areas under reforestation.
8.	Collaboration platforms or initiatives	1. Search for resources outside the federal budget. For example: o Include other beneficiaries of ecosystem services to support PES. o Insurance companies as partners for restoration o Governmental enterprises: CFE, SCT 2. Collaboration talks with SADER to conserve resources such as water and soil, and to foster deforestation free supply chains in avocado, ranching, soy; agree on reconversion of ranching through sustainable practices. 3. Collaborations by strategy using information of CONAGUA, INECC, IMTA, etc. 4. PROFEPA is designing a strategy with other stakeholders to address illegal logging. 5. Sistema Nacional de Monitoreo de Biodiversidad. Is an inventory at CONABIO to be linked to the INFYS (2015-2017) through the communitarian Monitoring protocol (BIOCOMUNI)
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	a. According to the new LDFS, SADER needs to apply subsidies using an information system to ensure there is no deforestation. Nonetheless, SIAP is not using the system created by SADER and SEMARNAT. A participatory process to build and use a system that links conservation with agricultural programs is needed. b. Sembrando Vida crossed information with CONAFOR regarding regions, models and species in Durango, but CONAFOR has not been involved in the process any more in the other states. c. The law does not state clearly the property of avoided emissions d. The new Forestry Law (LDFS) needs to be reviewed. Red tape and long terms for SEMARNAT's resolutions. **e.** Coordination in the territory with monitoring of results. Institutions are led by sectoral approach.
11.	Monitoring and evaluation tools, mechanisms or criteria	Goals are set using the following criteria: a. Focalization in areas with more potential for sustainable forest management as well as challenges (Yucatan Peninsula, Chiapas, Guerrero, Jalisco and Michoacán) and areas with more deforestation and degradation (Puebla, Hidalgo, Estado de México, Chihuahua) b. Strengthen local promotors of programs: 80% of personnel are in the field c. Alliances with other Ministries for more support to population d. Work with universities and research centers e. Work with APDT including intermunicipal juntas f. Typology of producers to increase effectiveness in programs
12.	Key practices (sustainable production and	

	conservation practices)	
13.	Recommendations for addressing threats	1. Work with local governments. Learn from REDD+ process in Mexico. 2. Strengthen institutional arrangements at different levels (intermunicipal associations, REDD+ agents of landscape development (APDT), etc.) to articulate policies and institutions more effectively. Develop a menu of alternatives for institutional arrangements (APDT, juntas, NGOs, etc.) 3. Focalization of efforts and resources 4. Reforestation as a process of restoration of priority areas for connectivity and hydric intake, in areas with high poverty rates. 5. Promote a National market for carbon emissions where forest carbon is a potential compensation of other sectors such as energy, transport or oil, in combination with other resources. 6. More participation of private sector. 7. Strengthen the legality in timber production through the Sistema Nacional de Gestión Forestal at SEMARNAT.
14.	Additional documents or resources	

	Interviewed Person and Organization: **Armando Alanís, CONAFOR** **Type:** GOM	
1.	Conservation priorities	For MRV in CONAFOR: a. INFYS- estimate Carbon stocks in Mexican forests. Field work for obtaining data. b. Sistema de Monitoreo Forestal. Remote sensing to capture forest ecosystem dynamics; areas of change. c. Sistema de Reporte y Verificación. Estimate emissions. Will be done every 2 or 3 years in collaboration with INECC and state governments to calculate emissions and absorptions in the forest sector.
2.	Priority geographies	
3.	Threats	- The Technical Unit within CONAFOR is a key area to calculate emissions. It now has a very limited capacity and a finance for three years. It is at risk and with high uncertainty. - Work is slowly being done due to budget cuts and lack of additional resources: INFYS used to process 5,000 conglomerates annually but now CONAFOR has resources to process only 1,600. This means that information is less reliable to calculate forest growth rates and emissions. - Deforestation drivers: avocado, land use change and division of the forest in the South. Sembrando Vida program.
4.	Changes in past five years (+ and -)	MADMEX is being used now with improved algorithms. Its classification of vegetation was useful. SAMOF is the new system being developed at CONAFOR to use open source data and improvement of MADMEX. Jalisco is being a pilot project for inventory of GHG to verify thematic exactitude.
5.	Key institutions (to	a. An institutional working group for landscape monitoring.

	be created or strengthened)	b. Center of Excellence within the South-South Cooperation project to share knowledge. c. The Technical Unit within CONAFOR. Needs five more people for data processing.
6.	Key programs or initiatives	
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	Better definition of secondary vegetation in the new Forestry Law (LGDFS)
14.	Additional documents or resources	

	Interviewed Person and Organization: **Lucia Madrid, SEMARNAT** **Type: GOM**	
1.	Conservation priorities	- Illegal logging is not the most important driver of deforestation. Crops such as avocado are far more important, or soybean and grains; palm oil begins to be so as well. Tourism and urbanization are important drivers, too. Hotspots include areas such as Hopelchen, Chiapas, Jalisco, and Michoacán. o Within the operation of SEMARNAT:

		○ Long periods to answer requests of permits and authorizations. Lack of transparency and traceability. The aim is to create integrated systems for environmental management. - Reduced budget. Changes in SEMARNAT. PROFEPA has insufficient resources and limited capacity for supervision (600 inspectors nationwide for all sectors and geographies) - Informal land use change processes. The country losses 200 thousand hectares a year and only 11 thousand have requested land use change authorizations.
2.	Priority geographies	
3.	Threats	- Capacity building in government officials for transparent and efficient processes of authorization and surveillance.
4.	Changes in past five years (+ and -)	Project with USAID to finance the improvement in the National system for forest management. Calculations point to a loss of 100 million pesos due to flaws in the system, only accounting time loss in SEMARNAT and communities. A first phase concentrates in solving flaws; a following stage will concentrate in an evaluation of the best way to improve or integrate a more robust system that can share information among institutions and improve transparency. A final stage will consist in building a traceability mechanism for logging. Traceability is complex due to processes within sawmills and will require improvements in the Federal Forestry Law (LGDFS) and a correct planning and drafting of the regulations for the LGDFS regarding plantations and forest harvesting.
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	- *Sembrando Vida* has not requested land use change. The program aims for restoring degraded areas with agroforestry practices. Collaboration with SEMARNAT has not been strong. The target is one million hectares under the program; this year the target is 400 thousand. - Collaborations that need to be strengthened: supply chains with important industrial timber processors.
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	- Technology and systems for authorization processes and sharing data - Legality and traceability mechanisms - Environmental impact systems Build capacities in sawmills and plantations to improve their reporting practices
9.	Enabling conditions	- CONAFOR inventories and maps. Legality of timber and no timber forest products: Traceability systems being developed in coordination with CONAFOR, USDA and USAID
10.	Gaps (information gaps and intervention gaps)	
11.	Monitoring and	- Implement traceability systems to improve certainty, transparency and sustainability in forest markets

	evaluation tools, mechanisms or criteria	- Streamline process for authorizations land use change and forest management. There are currently delays, bottlenecks and a lot of discretion in the authorization process chain. - Improve the forest law and standards (e.g. NOM 152) Improve collaboration with the private sectors in value chains, specially construction, transportation and logistics (pallets), pulp and paper
12.	Key practices (sustainable production and conservation practices)	

13.	Recommendations for addressing threats	- Illegal logging is not the most important driver of deforestation. Crops such as avocado are far more important, or soybean and grains; palm oil begins to be so as well. Tourism and urbanization are important drivers, too. Hotspots include areas such as Hopelchen, Chiapas, Jalisco, and Michoacán.
		  ○ Within the operation of SEMARNAT:
		  ○ Long periods to answer requests of permits and authorizations. Lack of transparency and traceability. The aim is to create integrated systems for environmental management.
		- Reduced budget. Changes in SEMARNAT. PROFEPA has insufficient resources and limited capacity for supervision (600 inspectors nationwide for all sectors and geographies)
		
		Informal land use change processes. The country losses 200 thousand hectares a year and only 11 thousand have requested land use change authorizations.

14.	Additional documents or resources	

	Interviewed Person and Organization: **Salomón Díaz, Director de Ordenamiento Ecológico, SEMARNAT** **Type: GOM**	
1.	Conservation priorities	Ecological Land Use Plans (ELUP) as a means to protect the environment, ecosystems and biodiversity
2.	Priority geographies	- Gulf of Mexico - Golf of California - Pacific coast
3.	Threats	- Land use change: forest to agriculture and urban. In coastal areas mangroves and costal ecosystem for urban, tourist and energy exploration. - Maritime transportation: waste and invasive species - Unsustainable and illegal fishing -
4.	Changes in past five years (+ and -)	- 144 decrees of ELUP since 1994 covering about 52% of the national territory - -70 ELUPs are currently being developed - Technical and procedural improvements - Interest in the instruments has been kept -
5.	Key institutions (to be created or strengthened)	- Strengthen coordination mechanisms
6.	Key programs	- Biocultural territories

	or initiatives	- Continue with ELUP in priority areas - National strategy of climate change adaptation - Gender initiatives - Central pacific
7.	Key examples on the ground	- ELUP Cancun/Tulum - Benito Juarez - Important infrastructure projects have been modified to comply with the ELUP - Fairly well-known instrument: communities are familiar with it - It has fostered sustainable production value chains in the sates Oaxaca and Chiapas
8.	Collaboration platforms or initiatives	- The planning process of each ELUP involves an agreement between SEMARNAT and other federal institutions, state and municipal governments, private, civil society. - Interministerial collaboration committee - For marine ELUPs: CONAPESCA/INDEPESCA, SECTUR, SCT, SENER, SEDATU, and SEMAR. - For terrestrial: SADER, CONAFOR, SECON (DG-Mining), SECTUR - Private sector organizations and chambers: Tourism, mining, rural development, fishermen, - Environmental NGOs - State Planning and Development Committees (COPLADES), Municipal Planning Councils (COPLAMUN), Watershed Councils.
9.	Enabling conditions	- Budget, stronger coordination with other sectors
10.	Gaps (information gaps and intervention gaps)	- Weak enforcing mechanisms. Its implementation takes place through other instruments such as environmental impact assessment, land use change permits and ASEA´s evaluations. - No budget for this instrument has been allocated since 2015. - Resources could be used for assessment and follow up of ELUP already in place. - Monitoring, verification and evaluation capacities - Valuation of ecosystem services
11.	Monitoring and evaluation tools, mechanisms or criteria	- Lack of indicators and performances metrics. The ELUP regulation mandates evaluation mechanisms but such mechanisms have not been developed.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- Some financing sources: Pedro y Elena foundation, Banamex, Conservation international, GEF, IKI-Germany, TPS, Bioconect, Green fund, national adaptation plan, states and municipalities. - Certification: Earth check, green gloo - Develop monitoring and evaluation mechanisms - Align instruments to current public policy priorities: biocultural territories
14.	Additional documents or resources	http://dgeiawf.semarnat.gob.mx:8080/ibi_apps/WFServlet?IBIF_ex=D4_R_ORDECOL00_03&IBIC_user=dgeia_mce&IBIC_pass=dgeia_mce Sistema interactivo de Consulta de Información sobre Ordenamiento Ecológico (SIORE) http://gisviewer.semarnat.gob.mx/aplicaciones/uga_oe/#

	Interviewed Person and Organization: **Francisca Acevedo, CONABIO** **Type: GOM**	
1.	Conservation priorities	CONABIO has defined the strategy for agrobiodiversity in Mexico, based on the peer reviewed paper (published in *Frontiers*) The strategy includes social, genetic and genomic improvement and productivity, to be effective in conservation and production. In collaboration with institutions in Mexico. In terms of this statement, CONABIO is planning a new configuration of its operation.
2.	Priority geographies	Centered in native Mexican crops and wild relatives – the biological richness embedded in these crops are crucial for climate change adaptation and food production. Current strategy – GEF- has specific sites. For corn, sites are identified. Additionally, there are sites identified for wild relatives in Mesoamerica. Patricia Koleff can show this information at geospatial level (IUCN and British Government finance). -
3.	Threats	For crops, the priority is not to lose traditional practices. If monoculture continues its expansion, there is no possibility for conservation of crops in centers of origin, like Mexico. Conservation and management mean understanding the value - costing them out- of traditional activities; payment of these production practices, recognition of these crops in terms of nutritional and social values. This is related with a public health agenda at a regional level. Cultural values are very important for food security, health, and well-being of all. For wild relatives, the priority is the conservation of their what needs to ecosystems.
4.	Changes in past five years (+ and -)	Worldwide, increasing awareness of the importance of SHF and the value of traditional knowledge in production. Awareness of the need to change the way we produce food (e.g. The Global Alliance for Food – finances the TEEP project). At Nation level, the process of awareness is much slower.
5.	Key institutions (to be created or strengthened)	.
6.	Key programs or initiatives	- For GEF Project: 12 crops and its wild relatives. Based on that, indicators established by GEF's "Global environmental benefits". The goal is to maintain these 12 crops and relatives, at least. Value of agrobiodiversity and the products that are linked to them. Food, fiber. How consumers value this. - The economics of biodiversity (TEEB-PNUMA). Ecosystems services related to the way of production.
7.	Key examples on the ground	Studies by CONABIO are helping to point out who is cultivating native corn and where is it. This is key information for regulatory instruments for biosecurity.

8.	Collaboration platforms or initiatives	Different sectors are interested in collaboration. CONABIO tries to link these interests. There is a lack of concrete collaboration mechanisms. Currently: - MoU with BID to complement GEF Project. The objective of this collaboration with BID is to link corn Small Holder Farmers (SHF) with niche markets through their organization as groups or unions of producers. The objective is to access specialty or niche markets. Implementing partner is a Civil Organization: SC Promaiz Nativo – researchers and experts. - CONABIO works with biological resources and communitarian SHF to link them with markets. - Relationships with the scientific community. Donors are key partners to ensure continuity in the process and to include technologies into traditional knowledge; to promote a network of innovation with the participation of SHF, communities, research, and markets.
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	- Evaluation of costs for implementation of biodiversity conservation at farmer level. Not considered explicitly. - Gap- Decalogue for biodiversity conservation in agriculture and ranching. - Understanding of local and regional markets – SHF are supplying enough food to 54 million people in the country. Food sustainability. But we don't know how local and regional markets work.
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	Retribution to SHF that perform benefic practices for biodiversity through two available mechanisms: Treaty on photogenetic resources and Nagoya Protocol. The treaty refers to the access and benefit sharing mechanisms; the Protocol provides guidance for the use of resources (characterization, knowledge, industrial use, etc.). Their instrumentation is quite a challenge.
14.	Additional documents or resources	Artículo Frontiers: https://www.frontiersin.org/articles/10.3389/fpls.2018.00209/full Proyecto GEF (ver doc "Revised prodoc" en la sección GEF Alternative): https://www.thegef.org/project/securing-future-global-agriculture-face-climate-change-conserving-genetic-diversity Estudio TEEB AgriFood de los sistemas de producción de maíz: https://www.biodiversidad.gob.mx/genes/valoracion.html Artículo Bellón et al_2018:

		https://www.researchgate.net/publication/327289523_Evolutionary_and_food_supply_implications_of_ongoing_maize_domestication_by_Mexican_campesinos Página de agrobiodiversidad: https://www.biodiversidad.gob.mx/biodiversidad/agrobiodiversidad.html Concepto "amigable con la biodiversidad": https://www.biodiversidad.gob.mx/corredor/SPSB/

	Interviewed Person and Organization: **Patricia Koleff, Directora General de Análisis y Prioridades, CONABIO** **Type: GOM**	
1.	Conservation priorities	- Develop knowledge for decision making
2.	Priority geographies	- National, but considering geographies for priority species at risk, biodiversity hotspots, natural protected areas,
3.	Threats	- Land use change - Overexploitation: although there is insufficient information about this trend - Exotic/invasive species: need for legal origin certify and early warning systems - Climate Change: exacerbates the other threats - Low budgets and investment to face the challenge
4.	Changes in past five years (+ and -)	- Publication of Natural Capital - Enciclovida - Marine information system - Emerging topics like climate change
5.	Key institutions (to be created or strengthened)	- Subnational governments
6.	Key programs or initiatives	- National Biodiversity Information System - Species List (12 Million data), priority species at risk, support SEMARNAT to update 059 Standard (species at risk) - Geospatial data - Invasive/exotic species - Identify priorities for conservation in Mexico (restoration, risk, natural protected areas) - Climate Corridors: for adaptation strategies - Users of information: national and subnational governments, decision makers in other sectors, scientist and researchers, general public.
7.	Key examples on the ground	- Natural Protected Areas - Communication and dissemination of biodiversity information
8.	Collaboration platforms or initiatives	- All sectors are important: agriculture, fisheries, mining, tourism, economic development - Food security - Agenda 2030 and sustainable development goals
9.	Enabling conditions	- More stable and higher budget resources, - Stronger coordination with other sectors - Information, education and capacity building -
	Gaps	- Budget

10.	(information gaps and intervention gaps)	- Cross cutting planning and policies - Sustainability of consumption markets - Species connectivity -
11.	Monitoring and evaluation tools, mechanisms or criteria	- Information and knowledge compiled and managed by CONABIO serves diverse monitoring and decision-making processes including the state of species and ecosystems - CONABIO has developed its own internal systems to monitor and assess the number of users and potential impact of their resources
12.	Key practices (sustainable production and conservation practices)	-
13.	Recommendations for addressing threats	- Continuity to information CONABI´s information initiatives - Addressing global change (climate change, environment and ecosystems)
14.	Additional documents or resources	

	Interviewed Person and Organization: **Andrea Cruz, CONABIO** **Type: GOM**	
1.	Conservation priorities	Conabio's priorities: - Conservation of biodiversity - Particularly, current priority: agrobiodiversity and genetic diversity - State strategies (18 published / 23 in process). Priorities at a state level depend also on the technical and operative capabilities in each state.
2.	Priority geographies	Talking in consideration collaborative and operative capabilities and political agenda/priorities within the state governments: - Sur-sureste –Yucatan Peninsula, Oaxaca, Chiapas. To a lesser extent, Tabasco. - Centro occidente. Jalisco - Coahuila, Baja California Sur - Sonora
3.	Threats	- Tren Maya: It is not a comprehensive program - Direct factors: a. Land use change b. Pollution (Very little information on the impact of pollution in ecosystems and biodiversity) - Rotation change of public servants in office. - Lack of capabilities at an operative level. Lack of methodologies
4.	Changes in past five years (+ and -)	
5.	Key institutions (to be created or strengthened)	.

6.	Key programs or initiatives	-
7.	Key examples on the ground	-
8.	Collaboration platforms or initiatives	- BioFin - Information from cuentas económicas INEGI - PNUD – PNUMA – donors. - Biodiversity strategies are a building block to align activities and budgets. - Center for the coordination of biodiversity at SADER.
9.	Enabling conditions	Security and rule of law. For example, Guerrero should be a priority due to its biodiversity importance and forests but is not able to work there.
10.	Gaps (information gaps and intervention gaps)	- Diagnosis are useful but definition of implementation is needed. - A convener/articulator that allows to formulate a comprehensive strategy for implementation, with metrics at least process indicators and a baseline. This is valid for the national biodiversity strategy and state strategies. - Very little information on the impact of pollution in ecosystems and biodiversity. No research in this field.
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- A mechanism for transparency, follow-up. Indicators at a state level.
14.	Additional documents or resources	

	Interviewed Person and Organization: **Ignacio March, Director de Evaluación y Seguimiento, CONANP** **Type:** GOM	
1.	Conservation priorities	- 400 Voluntary Designated Conservation Areas (ADVCs) with the private sector and communities - Collaboration with subnational governments in conservation projects - Co-management schemes for conservation (e.g. Chamela, Jalisco) - Ecological restoration within NPA - Valuation and Payment for conservation of Ecosystem Services
2.	Priority geographies	- National - Borders with Belize and Guatemala - Northern Border - UICN Commitments: List of NPA with exemplary management - Biosphere reserve of San Pedro Martir

3.	Threats	- Land use change - Illegal activities: logging and wildlife trafficking - Wild fires - Climate change: Sargasso - Invasion of NPA for urban developments - Pollution from mines - Unsustainable fishing practices
4.	Changes in past five years (+ and -)	- Significant increase in the area under protection (both terrestrial and marine) - Institutional strengthening of CONANP - Visibility and reputation at the national and international levels
5.	Key institutions (to be created or strengthened)	- Natural Protected Area´s governance mechanisms
6.	Key programs or initiatives	- Evaluation and follow-up - CONANP´s operational programs - Institutional achievements - Information systems: statistics and mapping - Wild fire management - Invasive species strategy -
7.	Key examples on the ground	- Calakmul: successful sustainable community projects with regional brand (calackmiel) - Islas Marietas; Ecotourism - White Shark watching in Guadalupe Island
8.	Collaboration platforms or initiatives	- CONAFOR for prevention of land use change - CONAGUA: Meteorology monitoring and services - SECTUR: ecotourism projects and initiatives/ surveillance - SADER: Agroforestry practices and Sembrando Vida - Private Sector for purchasing land for ADVCs
9.	Enabling conditions	- More stable and larger budget resources, - Stronger coordination with other sectors - Address illegal activities
10.	Gaps (information gaps and intervention gaps)	- Budget - Cross cutting planning and policies - Sustainability of consumption markets - Strengthen monitoring capacity: e.g. Drone technology - Efficiency indicators: link to CONABIO´s monitoring system (e.g. Land use change) - Collaboration with subnational
11.	Monitoring and evaluation tools, mechanisms or criteria	- Information and knowledge compiled and managed by CONABIO serves diverse monitoring and decision-making processes including the state of species and ecosystems - CONABIO has developed its own internal systems to monitor and assess the number of users and potential impact of their resources
12.	Key practices (sustainable production and conservation practices)	- Calakmul: successful sustainable community projects with regional brand (calackmiel) - Islas Marietas; Ecotourism - White Shark watching in Guadalupe Island
13.	Recommendations for	- Continuity to information CONABI´s information initiatives - Addressing global change (climate change, environment and

	addressing threats	ecosystems)
14.	Additional documents or resources	

	Interviewed Person and Organization: **David Gutierrez Carbonell, Director de Coservación para el Desarrollo, CONANP** **Type: GOM**	
1.	Conservation priorities	- Achieve Aichi Targets (17% of terrestrial and 10% of marine surface under protection by 2020). The Aichi goal of marine surface has been achieving in terms of quantity, but quality is important. - Improve planning, and management effectiveness - Achieve at least 17% of ecosystem representativeness in each NPA. Expand NPA but focusing on representativeness, especially in marine NPA. - Improve conservation effectiveness
2.	Priority geographies	- Pacific Islands
3.	Threats	- Opencast mining - Productive projects in safeguard areas (e.g. oilfields in Lacandona forest, mangroves in the Sea of Cortez and the Caribbean, - Land use change - Climate change drives migration of ecosystems and species and increase the risk and intensity of wild fires - Invasive species - Illegal logging - Tuna and shrimp fishing
4.	Changes in past five years (+ and -)	- Unprecedented increase in NPA especially marine areas: Revillagigedo and Caribbean
5.	Key institutions (to be created or strengthened)	- ADVCs
6.	Key programs or initiatives	- Conservation and surveillance and monitoring - Subsidies for communities in Biosphere reserves and protection areas of fauna and flora, compensate resources owners for restrictions - Subsidy programs: PROCODES, PROREST, PACE - Voluntary Designated Conservation Areas (ADVC) - Units of Wild Life Management (UMAS)
7.	Key examples on the ground	- Vizcaino Reserve - Calakmul - San Pedro Martir
8.	Collaboration platforms or initiatives	- CONAFOR, CONABIO, CONAGUA, PROFEPA - SADER, SEDATU, MARINA, GENDARMERIA - NGOS, Universities, ejidos and rural communities -
9.	Enabling conditions	-
10.	Gaps (information gaps and intervention gaps)	- Financial gap of about 1,000 million pesos for effective operation - Improve performance indicators - Need for more personnel in NPA specially in marine areas (e.g. pacific islands)
	Monitoring and	- NPA indicators

11.	evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	- Sustainable Lobster Aquaculture - Whale watching
13.	Recommendations for addressing threats	- Address budget reduction by increasing Public-private financing - Strengthen law enforcement - Improve visibility and political will
14.	Additional documents or resources	

	Interviewed Person and Organization: **Antonio Díaz de Leon, Subprocurador de Recursos Naturales, PROFEPA** **Type: GOM**	
1.	Conservation priorities	- Protection of Biodiversity - Environmental Law Enforcement - Environmental Justice
2.	Priority geographies	- Upper Golf of California - Chiapas and in particular Montes Azules Reserve - Calakmul - Other NPAs and Biodiversity rich hotspots
3.	Threats	- Illegal logging - Wildlife extraction and trafficking - Link with organized crime - Irregular land use change, invasion of protected areas and urban sprawl into buffer zones.
4.	Changes in past five years (+ and -)	- Decrease in number of inspectors - Significant budget cuts: the budget of its unit went from 15 in 2018 to 4 million this year
5.	Key institutions (to be created or strengthened)	- Build capacities in the Judicial system on environmental and natural resources issues to address impunity and strengthen incentives to comply with the law
6.	Key programs or initiatives	- Intelligence systems: Compilation, validation and analysis of information; field, geospatial and financial intelligence, operation protocols - Information technologies: integrated systems, big data, remote surveillance, GIS, expert systems - Social Participation: Citizen observatories, advisory councils, public consultations, complain mechanisms, citizen networks, surveillance participatory bodies - Institutional reengineering: standardized and automated processes, intra-agency and inter-agency automatized coordination, process stream lining, revision and adjustment of environmental compensations
7.	Key examples on the ground	-
8.	Collaboration platforms or initiatives	- Judicial system and legislators at all levels - Subnational governments - National security and other prosecution authorities - Inter-agency coordination with key areas in the sector such as

		the DG of Forest and Land, the DG of Wild Life, DG of Costal Development, CONANP, CONAFOR and CONABIO. - International enforcement authorities (e.g. agreements with Interpol and other countries)
9.	Enabling conditions	- Better coordination from actors within and outside the government - Social participation
10.	Gaps (information gaps and intervention gaps)	- Financial and human resources for inspection - Systems infrastructure to improve coordination, monitoring and surveillance - Monitoring and intelligence systems - Capacity building on intelligence and surveillance processes and systems - Capacity building specially in the judicial system -
11.	Monitoring and evaluation tools, mechanisms or criteria	- All above mentioned in section 6
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- Implementing the policies listed in section 6
14.	Additional documents or resources	

	Interviewed Person and Organization: **Amparo Martinez, Driectora General del INNEC/Margarita Caso, Coordinadora General de Adaptación al Cambio Climático, INECC** **Type: GOM**	
1.	Conservation priorities	- Conservation of ecosystems - Climate change adaptation - Risk management specially to vulnerable human populations
2.	Priority geographies	- Natural Protected Areas - Marine and Costal Ecosystems - Tropical and temperate forest - Grasslands - Highly vulnerable ecosystems like islands
3.	Threats	- Land use change - Climate change - Invasive species - Pollution of rivers and lakes - Diverse pressure on island and marine ecosystems
4.	Changes in past five years (+ and -)	- Improvement of knowledge of ecosystems and threats - Environmental awareness in other sectors: agriculture and livestock, subnational governments - Involvement of the youth and other interest groups
5.	Key institutions (to be created or strengthened)	-
6.	Key programs or initiatives	- Conservation and landscape restoration - Adaptation component of the National Communications to the

		UNFCCC - National Vulnerability Atlas - National Climate Change Adaptation Plan - Adaptation actions in sectoral policies and financing mechanisms for adaptation
7.	Key examples on the ground	- ANP Monarca reserve - Wildlife without borders - Land tenor peasants (Exzequiel Ezcurra) - Wetland adaptation projects to climate change financed by GEF (Alvarado-Veracruz, Carmen Pajonal-Tabasco) - Mangrove restoration projects in different parts of the country. A good example is the mangrove reforestation project with the CONAFOR and the private sector in Nuevo Vallarta.
8.	Collaboration platforms or initiatives	- CONABIO - CONANP - State Universities
9.	Enabling conditions	- Partnerships with the private sector, financing from development banks
10.	Gaps (information gaps and intervention gaps)	- Financial resources for adaptation projects - Coordination with CONAFOR, SADER, CONAPESCA and INEPESCA
11.	Monitoring and evaluation tools, mechanisms or criteria	- Atlas of Vulnerability - Ejido Bacalar: community monitoring of forest - Union de Pueblos Lacandona: Biodiversity Monitoring systems - INECC´s watershed monitoring schemes
12.	Key practices (sustainable production and conservation practices)	- Indapura: financing of sustainable forest management in Mixteca Communities - USACHI in Sierra de Juarez: sustainable forest management, ecosystem services and social benefits - SAO-Oaxaca: Voluntary carbón markets - Paso del calabozo, Jalisco: Community sustainable forest management with technical assistance.
13.	Recommendations for addressing threats	- Implementing the general Law of Climate Change - Improving the sustainability of agricultural practices - Advancing Ecological Territorial Planning
14.	Additional documents or resources	

	Interviewed Person and Organization: **José Medel Córdova Pérez, Sembrando Vida Project, SECRETARIA DE BIENESTAR** **Type: GOM**	
1.	Conservation priorities	Poverty, food security, income generation for very small producers
2.	Priority geographies	Mexico
3.	Threats	Lack of adequate seeds for the regions of application of the program, changes in rain patterns, burning of primary and secondary forest outside the rules of operation of the program
4.	Changes in past five years (+ and -)	The support goes to the very small producers and not to the production associations.
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	Agrosilvopastoral system associated to milpa systems with particular characteristics of flora use according to the peculiarities and conditions of each region.
7.	Key examples on the	

	ground	
8.	Collaboration platforms or initiatives	SEDEMA, SEDATU, SADER
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	Certified high-quality seeds for each of the regions, lack of local capacities from hired personnel.
11.	Monitoring and evaluation tools, mechanisms or criteria	Hectares covered
12.	Key practices (sustainable production and conservation practices)	Agrosilvopastoral practices
13.	Recommendations for addressing threats	The program is conditions to the integration and maintenance of milpa system for food-security of families in rural areas.
14.	Additional documents or resources	

Non-Governmental Organizations (NGO)

	Interviewed Person and Organization: **José Warman & Martha Caballero** **ESPACIOS NATURALES PARA EL DESARROLLO SUSTENTABLE (ENDESU)** **Type:** NGO	
1.	Conservation priorities	ENDESU's priority is to sustain its mission: restoration of ecosystems through sustainable productive activities. Its expertise is to include the agricultural activities as part of the solution. Ecosystems in Mexico are highly degraded and need to be restored working hand in hand with land owners; even NPA have people living in them (80%). Lines of work: a. Species and habitat; b. Restoration of habitat (linked to reforestation); c. Productive restoration (liked to line c.); Environmental awareness. Support to local NGOs and local stakeholders in for strengthening their administrative and management capabilities is a cross-cutting priority. ENDESU maintains a comprehensive approach where species and habitats are intertwined.
2.	Priority geographies	• Baja California Norte & Sur – Recuperation of the peninsular pronghorn (*berrendo)* and condor. • Zacatecas, Aguascalientes, San Luis Potosí – Habitat restoration for the royal eagle and prairie dog. • Huasteca – Restoration using technologies such as sustainable ranching for small holders to overcome degradation-poverty cycle. • Tabasco – Cañón de Usumacinta. Alternate productive activities such as palma camedor, flower production under tree cover. • Collaboration with Fondo Mexicano para la Conservación de la Naturaleza in NPA.
3.	Threats	Illegal logging, land use change for agricultural uses. Besides what we have seen, current public policies do not relate poverty and environment as two interrelated concepts. Current programs such as *Sembrando Vida* is now three times the budget for PES and might have negative effects on conservation and forests. The GOM do not recognize NGO and civil society participation as meaningful.

		Very limited public resources, a drastic cut in budgets (e.g. A budget of 125 million for the Forestry Certification Program in 2018 is now only 30 million in 2019). Lack of clear environmental policies. International funds are not flowing due to a perception of uncertainty.
4.	Changes in past five years (+ and -)	It is a challenge to maintain an agenda in the current environment. Increasing competition for development funds. SHCP has more regulation that means more complexity for administration and extra costs for NGOs. Small local NGOs are more vulnerable and are more likely to disappear.
5.	Key institutions (to be created or strengthened)	International funds will be crucial in a context of uncertainty and limited governmental resources.
6.	Key programs or initiatives	
7.	Key examples on the ground	Plots with 10 years under improved practices and capacity building in Veracruz and Tabasco; with diversification of income and restoration of soils. In the Tuxlas region in Chiapas, productivity is now two-fold or five-fold with sustainable ranching practices. In different ecosystems ENDESU works with families for backyard production and sustainable practices to enhance food security and conservation.
8.	Collaboration platforms or initiatives	- Biocultural Landscape in Sierra Occidental, Jalisco. Collaboration with AFD. A unique bottom-up approach. ENDESU has the administration of the project. It includes the government, but it does not depend on public intervention. - With US Wildlife Service, collaboration for conservation of migration birds by monitoring of species and restoration of forest in Tabasco. Relevant partners: International development agencies, Fondo Mexicano de Conservación de la Naturaleza, other NGOs.
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	Atomization of producers. Subsidies that promote clientelism.
11.	Monitoring and evaluation tools, mechanisms or criteria	There are no projects for establishment of metrics. It depends by donor. Limited capacity for planning to target actions more strategically.
12.	Key practices (sustainable production and conservation practices)	

13.	Recommendations for addressing threats	Finance for at least 3-5 years. Organization of farmers or communities for sustainability. Communication efforts (e.g. ENDESU TV)
14.	Additional documents or resources	

	Interviewed Person and Organization: **Juan Manuel Frausto, Director del Programa de Bosques y Cuencas del Fondo Mexicano para la Conservación de la Naturaleza** **Type: NGO**	
1.	Conservation priorities	- Integrated territorial management - Maintain and recover ecosystem functions - Capacity building, technical assistance and financing
2.	Priority geographies	- Forest landscapes in federal natural protected areas, biological corridors and watersheds
3.	Threats	- Deforestation and forest degradation - Wildfires - Overregulation - Lack of awareness of biodiversity value and sustainable management practices - Lack of incentives for sustainable forest management and green business opportunities.
4.	Changes in past five years (+ and -)	- Increase in forest degradation and deforestation - Reduction of government budget and human resources - Strengthening of productive activities in forest landscapes - Increase of opportunities to community forest enterprises - Emerging agrobiodiversity and sustainable livestock practices - Low carbón development projects
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	- Fire management and restoration fund ($4M) - Watersheds and Cities ($10M) - Monarch Butterfly conservation fund ($5M) - Biodiversity Monitoring ($1M) - Emfoco: proposes to improve the profitability, environmental, social and financial sustainability of community forestry companies ($19M)
7.	Key examples on the ground	- Fire management and watershed management - Biodiversity monitoring - Payment for ecosystem services - Community forest enterprises - Financing to forest companies
8.	Collaboration platforms or initiatives	- Federal and state governments - Civil society organizations - Foundations - Development cooperation agencies and banks Community organizations - Universities and research institutions

9.	Enabling conditions	- Rule of law - Security - Collaboration with governments - Support to civil society organizations and rural communities - Stronger links with the academia and research communities - International financing - Government support for accessing and implementing international financing
10.	Gaps (information gaps and intervention gaps)	-
11.	Monitoring and evaluation tools, mechanisms or criteria	- Indicators: surface under protection, preserve or restored - Participants: people, communities, enterprises, trainees. - Financial leverage: - Best practices
12.	Key practices (sustainable production and conservation practices)	- FOMAFUR - Watersheds and Cities - Monarca Fund - BIOCOMUNI - EmFoCo - Long term financing for sustainable rural projects - Participation of local organization and communities - Support specific management practices - Strengthen economic, technical and organization capacities at the regional level. - Establish coordination frameworks between governments, civil society and communities. - Improve public policies
13.	Recommendations for addressing threats	- Long-term financing - International technical and financial assistance - Attraction of private donors
14.	Additional documents or resources	

	Interviewed Person and Organization: **Ernesto Herrera, Daniel Sánchez, REFORESTAMOS MÉXICO** **Type: NGO**	
1.	Conservation priorities	a. Development of collaborations /consortia for landscape management. Strengthening governance processes (e.g. COBIOCOM). Strengthen state governments with certainty and continuity. Strategies for connectivity and management with communities for effective conservation. Human and communitarian factor. FSC and restoration models. Working in these topics in rural areas but also at for resilience in cities. b. Entrepreneurship in the forestry sector. Investment funds, Business incubators/accelerators. This line of action is built using as a building block or platform the governance mechanisms and collaborations in the first line of action (a). c. Transparency. Accessible information.
2.	Priority geographies	- West Mexico- COBIOCOM area - Forests that surround big cities - Selva Maya
3.	Threats	1. Lack of collaboration among stakeholders for comprehensive and congruent solutions in the territory,

		2. There is no mainstreaming of sustainability. No collaboration among sectors. 3. Paternalist perspective set on subsidies puts pressure on ecosystems and inhibits the entrepreneur spirit of communities. Under this perspective and culture is very difficult to promote a private sector mentality. 4. Lack of clarity in current public policies. 5. *Sembrando Vida Program*- An incentive for deforestation plus reduced budget for the environmental sector.
4.	Changes in past five years (+ and -)	
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	- Generate information available for public and private sector; oriented to decision- making. For example, Transparency Index for Natural Resource Management. Dialogue organized with WRI to promote legality in the forestry sector. Policy analysis for SEMARNAT in forestry information system. - Landscape consortia: COBIOCOM. Alliances for FSC in Mexico. Value chains that can use the FSC in Mexican context. - Entrepreneurship- "Joven emprendedor forestall". A contest for receiving the best ideas in Universities and establishing a relationship with teachers and curricula. Contests in Guatemala, Mexico, Peru and is expanding to Colombia and Chile. - AMEBIN. Tools: natural capital protocol. Initial phases with 5 companies that are testing the protocol in their operation (one from each economic sector, not only philanthropic point of view). The objective is to provide lessons for other companies and know-how for potential implementers of the protocol in Mexico. Incorporation of blended finance.
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	1. AMEBIN – Alianza Mexicana de Biodiversidad y Negocios. Started from the need as an alliance between PNUD-Reforestamos Mexico-SERMANAT and INECC for the Business Forum at the Biodiversity COP13. As a result of the forum, the companies requested to know more about biodiversity in collaboration with NGO. Great interest from companies in AMEBIN and an openness to share information. 1. UNOFOC for certification in the union de ejidos with 13 million hectares. Also certified communities are governance structures that can help align policies and efforts on the ground. 2. ANAE (Association of state authorities for environmental policies) 3. ANDE (Aspe Development of Entrepreneurs is a system for entrepreneurship and impact investment. 4. UICN 5. Companies (philanthropic areas): Bimbo, Bancomer, Banamex, Citi, Santander, American Express.
9.	Enabling conditions	Articulating agent, convener. RM works through collaborations to fill this gap.

10.	Gaps (information gaps and intervention gaps)	- Articulating agent, convener. RM works through collaborations to fill this gap. - Lesson learnt from AMEBIN: a. Once the forum was generated, there were no specific requests for companies in terms of projects or processes. b. Lack of understanding from private sector about how NGOs work. c. NGOs oversimplify about how companies work and their internal decision-making processes. d. Most NGOs don't have areas devoted to private sector engagement, fundraising. e. Donors are not financing generation of data/information. Lack of understanding of how markets work and a theory of change from a private sector point of view. - Mapping of available talent and human capital to respond quickly to donor's calls. - Synergies to diminish costs among NGOs (Think in strategies such as coworking spaces)
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
	Recommendations for addressing threats	- Include private sector engagement tools, capacity building initiatives with companies. Devote resources to this line of action from the design of projects. - New capabilities in NGOs to fill the gaps of private sector inclusion. - Finance conveners and synergies among NGOs and stakeholders. - Mapping of available talent and human capital
	Additional documents or resources	

	Interviewed Person and Organization: **Tatiana Ramos, Juan Manuel Labougle, CONSERVATION INTERNATIONAL (CI)** **Type: NGO**	
1.	Conservation priorities	CI has changed it global priorities and set the following: - Nature for climate - Landscapes - Conservation of Oceans - Innovation (Technical and financial) Biodiversity is a cross-cutting strategy.
2.	Priority geographies	- Chiapas (Sierra Madre de Chiapas) - Oaxaca (Sierra Sur, Costa, interest in Itsmo de Tehuantepec). - Tabasco - Puebla - Hidalgo for coffee production. CI priority is to have National presence and influence. Integration of Climate Change and biodiversity agenda in agriculture.
3.	Threats	

4.	Changes in past five years (+ and -)	In spite of funding and efforts, land use change in the Yucatan Peninsula and Chiapas continue to increase. For deforestation that has already happened, and we need to recover connectivity and areas that are habitat for resilience and biodiversity in climate change conditions. Models for restoring connectivity are already available such as agroforestry systems.
5.	Key institutions (to be created or strengthened)	

6.	Key programs or initiatives	- Sustainable Landscapes in Chiapas and Oaxaca
		- Value chains and markets
		  o Cacao and coffee as strategies for sustainable production and communitarian participation. Links with markets. Participation of projects and producers in Amsterdam trade fair
		  o Honey, Fisheries, tourism, plant resins, flowers.
		- Financial innovation- include investors, private sector and markets. Link credit from development banks (FIRA, Financiera Nacional de Desarrolo)
		
		Working with IKI and GEF funding.

7.	Key examples on the ground	- Rayén, Chiapas- Cacao production. A project linked to the market from the start. No middle men. - Takaná- Coffee. - Shadow coffee diversification. Partnership with Louis Drefus & Starbucks. Sierra Sur Oaxaca. - Partnership with Starbucks for a standard – origin coffee for Jaltenango Chiapas.
8.	Collaboration platforms or initiatives	- SADER Biodiversity Center - Working group to integrate biodiversity into policies. Promoted by GIZ - Secretaría de Bienestar (INAES) & FIDA for Sur-Sureste. Social enterprises with elements of biodiversity.
9.	Enabling conditions	
10.	Gaps (information gaps and intervention gaps)	
11.	Monitoring and evaluation tools, mechanisms or criteria	Each project has its own KPI. Donor oriented. Challenges to measure biodiversity: A standardized and authoritative monitoring protocol is needed. Potential collaboration with CONABIO.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for	

	addressing threats	
14.	Additional documents or resources	

	Interviewed Person and Organization: **Ana Gorgollo, Alejandra Salazar, PRONATURA A.C.** **Type: NGO**	
1.	Conservation priorities	a. Water – Rehabilitation of watersheds. Strengthen governance platforms at a watershed level. Generation of participative schemes. b. People- improved practices. Opportunities. Corporative volunteering. Environmental capacity building, improved practices of consumption and production. Financial solutions for sensibilization of carbon topics. c. Cities and Nature. - Recuperation of priority species. Green infrastructure. Agrobiodiversity. Green areas to promote connectivity of ecosystems and species. Endemisms. Increase ecosystem services and adaptation to climate change.
2.	Priority geographies	Neovolcanic Axis Jalisco, Colima, Estado de México, Morelos, Hidalgo, Puebla, Tlaxcala
3.	Threats	- Ecosystem fragmentation - Over exploitation and contamination of water sources - Connectivity loss. - Climate change potentiates negative effects
4.	Changes in past five years (+ and -)	-
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	- Water harvesting - Collaboration with private sector. Investment in climate change mitigation and adaptation and biodiversity conservation. Help corporate social responsibility (CSR) areas for the implementation of Natural Capital Protocol. Generate capacities in private sector and national consultants. - Carbon bonds - Open data / information platforms: commodities & biodiversity map; Nature Serve is an open source platform to show projects and their impacts. - Corporate volunteering programs
7.	Key examples on the ground	- Reforestation and water harvesting – 1300 communities and municipalities. Clear and precise metrics.

8.	Collaboration platforms or initiatives	- With other PRONATURA associations in the country (six of them) - AMEBIN (Alliance of private sector for biodiversity conservation) – Was created to promote Aichi Commitments and local capabilities. - Euroclima plus –Ecosystem based adaptation. Strengthen sectors and municipalities to generate policy based in ecosystem conservation. Brazil and Mexico are pilot countries. - Work with communities for reforestation and water harvesting. Key partners: - CONANP, CONAFOR (national reforestation program, information about sites, nurseries) - Companies: Fundación Walmart, Nestlé, Bimbo, Coca-cola has given great stability in projects. - TNC & WRI -
9.	Enabling conditions	- Great fiscal burden and red tape that disincentivizes forestry, reforestation and sustainable practices on the ground. NGOs need to comply with increasing requirements (Ley antilavado and SHCP).
10.	Gaps (information gaps and intervention gaps)	- Complement alliances for collaborative funding. - Strategic planning, follow-up and support processes, evaluation are topics not covered by donors, but is crucial for success and sustainability. With 15% of administrative costs there is no room for professionalization of NGOs. - There is still no change of paradigm to a landscape approach. Each donor and initiative has its own exclusive idea. Lack of alignment and competition for scarce resources and grant opportunities. There is a need to invest in NGOs (professionalization, long-term presence)
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	Water harvesting practices
13.	Recommendations for addressing threats	- Fiscal or other type of incentives for companies to invest in carbon bonds - Storytelling of the importance of biodiversity - Alliances among NGOs and institutions working in conservation
14.	Additional documents or resources	

	Interviewed Person and Organization: **Meredith de la Garza, THE NATURE CONSERVANCY** **Type: NGO**	
1.	Conservation priorities	Maintain marine natural habitats and resources by working with different stakeholders and providing the correct incentives.

2.	Priority geographies	Golfo de California, Pacífico subcaliforniano, Mesoamerican Reef.
3.	Threats	- Untimely actions to prevent or mitigate impacts. - Not enough information in the marine sector. - Lack of governance mechanism. - Poverty- Fishing is a way to cope with poverty. Fishermen are usually people without land and property. - Drivers: a. Affectation of social tissue in communities. Drugs. b. Impunity – illegal catching c. It is not documented, but a way that organized crime capitalize a dismembered group is through extortion, theft of catch such as shrimp.
4.	Changes in past five years (+ and -)	Positive: - More communities in Golfo de California with innovation, more surveillance of their catching areas. - More demand for sustainable products - Less demand for meat and call against animal cruelty on animals lead to an increased demand for fish. Negative: - Lack of resources and budget cuts from GOM. - Dismantling of institutions. - Impunity - Climate change - Helplessness of remote communities (better articulated communities can coordinate better responses)
5.	Key institutions (to be created or strengthened)	Key barriers are lack of property rights, no collateral in fishing activities. NGOs locally to help strengthen communities. Organization and strengthening of communities for the conservation of their resources
6.	Key programs or initiatives	1. Sustainable fisheries a. Increase capabilities. b. Fish Path technology for identification of species 2. Financial mechanisms for sustainable fisheries. Social security debt swap for conservation activities. Social welfare fund for fisheries / fishermen and women with concurrent funds. 3. Action plan for swamp white shrimp. – Impact investment in collaboration with NatureVest (TNC impact investment area). To diminish the pressure for overfishing.
7.	Key examples on the ground	No catch zones. TNC complemented resources to achieve more progress.
8.	Collaboration platforms or initiatives	- Fish Path technology for identification of species. Adapting the technology to Mexico in collaboration with CONAPESCA/INAPESCA - COBI, CONSELVA, Naparajá – NGOs working with communities - Golfo de California has received investment in capacity building. The Fondo Mexicano and Fondo del Noroeste has helped strengthened NGOs
9.	Enabling conditions	

10.	Gaps (information gaps and intervention gaps)	- Coastal resilience initiatives with hotels and developers. - Biomass, catch, places for fishing – these are information gaps to know how much fishing can be done. FishPath is an effort in this area
11.	Monitoring and evaluation tools, mechanisms or criteria	Conservation areas: Hectares No-catch zones – biodiversity and productivity increase (30% in five years) Biomass, catch, places for fishing – these are information gaps to know how much fishing can be done.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	-
14.	Additional documents or resources	https://www.facebook.com/TheNatureConservancyMexico/videos/714028362390104/ Documents on Marine and Coast Biodiversity **https://drive.google.com/drive/folders/18yEvEGzHIzApThIa9khPBKcLfmn20h_E?usp=sharing**

	Interviewed Person and Organization: **Jorge Rickards, WWF** **Type: NGO**	
1.	Conservation priorities	Water, Climate change and Energy, Terrestrial Ecosystems, Resilient Oceans. Its mission is centered in the preservation of biodiversity by conserving key areas and promoting connectivity.
2.	Priority geographies	Areas that are still well preserved and need support for conservation. The new WWF approach crosses thematic priorities with geographies and not only a geographic criterion of intervention. Mesoamerican Reef / Chihuahua Desert / Golfo de California / Mariposa Monarca / Oaxaca - Selva Maya (Yucatan Peninsula, Lacandona and Guatemala) is the most well-preserved medium forest in Mexico. - The Neovolcanic Axis is rich in biodiversity and is being threatened by urban expansion. WWF works there in cities (Guadalajara, CDMX) and runs its iconic program (Mariposa Monarca). - Cuenca Alta de Conchos and Sierra Tarahumara. North Mexico. Grasslands. Water reserves and key ecosystems. In coordination with the USA, WWF works

		in the Northern Great Plains. They are working in promoting the Sustainable Ranching Roundtable in Mexico. - Regarding sustainable fisheries, the work is centered in Bahía de Banderas, Oaxaca, Mesoamerican reef. A shared strategy of WWF in several countries from Revillajijedo down to Juan Fernández in Chile. WWF is promoting scientific tools for biological corridors. WWF participate in the global campaign for vaquita marina: pull out abandoned fishnets and supporting local NGOs on the ground. They work with fishermen that pullout nets.
3.	Threats	- Sinaloa Cartel. There was a stable social order, even of illegal activities. A year ago, the cartel entered the Totoaba business. - The fragile stability that has been in place for 20 years in many places is at risk due to a budget cuts in the environmental sector (e.g. PES, NPA) and for a lack of rule of law. Examples include Calakmul and Montes Azules. - Very week presence of government institutions, such as CONANP. Weak institutions + scant budgets = bad combination.
4.	Changes in past five years (+ and -)	-
5.	Key institutions (to be created or strengthened)	- NGOs to fill the gap left by a weak State. The role that NGOs play is even more important under this context. - Voluntary areas for Conservation (ADVC are interesting mechanisms for conservation but if they aren't provided by incentives, they are at risk of becoming abandoned areas. - Biocultural landscapes are an interesting instrument for conservation. Needs to be addressed and analyzed. Be careful to provide checks and balances to ensure conservation outcomes, not only social validation of specific agendas.
6.	Key programs or initiatives	
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	- Private companies that are interested in sustainability. WWF is approaching companies to help them with science-based targets, promoting public commitments to diminish their environmental footprint. Example of firms with potential or current work: Herdez, Telcel, SuKarne, Biopapel, Toks, Coca-Cola, Walmart, Procter and Gamble, Dow. - Global UN Compact - Mexico Sustainable Ranching Roundtable. - Key WWF partners: o WWF woks with 63 partners in the Alliance with Fundación Slim o Lacandona, Selva Maya forestal in Xpujil. o Strategic stakeholders in communities and communitarian councils working under sustainable practices. NGOs that support these processes (e.g. Amigos de Sian Kaan, Pronatura Peninsula de Yucatan, Fondo Mexicano, Pronatura Noreste, Pronatura Sur); others that support the legal and institutional processes (CEMDA). In fisheries and marine conservation (COBI, Niparajá, CEDO)
9.	Enabling conditions	- The current political environment generates uncertainty and is not incentivizing collaboration between civil society and public institutions. WWF is proposing to promote discussion and collaboration.

10.	Gaps (information gaps and intervention gaps)	- Rule of law. Presence of authorities for conservation and surveillance purposes. - Few development agencies/NGOs are addressing concrete processes for clear commitments with the private sector. Relatively few are integrating sustainability into their core business and few organizations are working hand-in hand for helping business walk the process. - Opportunity for continuity with Fundación Slim's funding. The first phase of 10 years of support have ended. Commitment as transformational funding for conservation in Mexico. - USAID is well positioned to create enabling conditions with stakeholders.
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	- Support civil society initiatives, NGOs to fill the gap left by a weak State. The role that NGOs play is even more important under this context. - Private sector collaboration and integration of solutions. - Collaborative and concurrent efforts: Mariposa Monarca integrates Fondo Monarca + PES+ ProBosque + productive projects with Johnson & Johnson and Telcel, Toks, Coca Cola, Wa). - Explore ADVCs but with matching government financing - Foster innovative territorial planning schemes: e.g. Biocultural landscapes, strengthen local governance schemes. - Work in a sectoral approach: agrobiodiversity, food security sustainable forest management
14.	Additional documents or resources	

	Interviewed Person and Organization: **Sergio Madrid, CONSEJO CIVIL DE MEXICANO PARA LA SILVICULTURA SOSTENIBLE (CCMSS)** **Type:** NGO	
1.	Conservation priorities	a. Technical recommendations and advocacy for public policy b. Work with communitarian organizations to strengthen their capacities for management of landscape and resources. This area includes supply and value chain promotion for timber and non-timber products. Both areas are linked. The law prohibits a mobile sawmill, which is needed innovation.
2.	Priority geographies	- Manatlán, Jalisco - Cerro Grande, Colima. - Sierra Norte & Sur, Oaxaca - Chinantla media y baja, Oaxaca - Cofre de Perote, Veracruz - Amanalco, Valle de Bravo, Estado de México

		- Xpujil. Calakmul - Quintana Roo - 4 municipalities, and some municipalities in Yucatan. CCMSS is an association of organizations working in ten regions in Mexico. Associates evaluate the needs on the ground and related to universities, government, and social sector.
3.	Threats	- Defense process against illegal logging - Organized crime - Invasion of lands - Expansion of tourism projects and other land uses causing deforestation. - Feasible inclusion of women, young population, and settlers in decision making processes. - Red tape for forest management and harvesting (e.g. MIA, management plan, contracts with service providers, guides, etc.) desincentivize sustainable development and rural inhabitants prefer other activities such as ranching. - *Sembrando Vida* is not perceived as a threat. Its objective is to strengthen capacities of rural owners. Deforestation is not the generality.
4.	Changes in past five years (+ and -)	
5.	Key institutions (to be created or strengthened)	
6.	Key programs or initiatives	1. Value chain integration. PLACCO platform to commercialize certified timber production in Riviera Maya premium hotels. 2. Measure inclusion to supply chains. 3. Capacity building (organization, administration, technical)
7.	Key examples on the ground	PLACCO - Value chain integration in Riviera Maya (four years working in this program) The level of production and sales is increasing, as well as prices. 20 formal contacts for supply in the region (e.g. Mayakoba and Fairmont Hotels).
8.	Collaboration platforms or initiatives	- FINDECA as financial partner - Educe in the commercialization strategy of organic honey - Hotels and hotel industry in Riviera Maya in the supply network - There is no collaboration with state governments, nor much interaction with intermunicipal associations. - Vegetable producers and with SADER, specifically dialogue with Undersecretary Victor Suarez to discuss solutions for sustainable production and stop deforestation and degradation due to pesticides and expansion of soy and sugarcane.
9.	Enabling conditions	- Alignment of public policies. Capacity building for this alignment to happen at a regional /local level. - REDD+ can be an opportunity for a landscape approach and implementation by aligning efforts with mitigation objectives. At the same time protect biodiversity and communities.

		- Municipal associations are useful and feasible when there are common problems that can be addressed jointly (e.g. JIRA, JIBIOPUUC versus Quintana Roo where there isn't an identified common problem).
10.	Gaps (information gaps and intervention gaps)	- Forest management and harvesting needs to be addressed with a perspective that values medium or poor forests, not the most successful associations or regions. Building of associations and governance structures is valuable as well as red tape simplification.
11.	Monitoring and evaluation tools, mechanisms or criteria	CCMSS has a good platform to measure technical parameters for timber production and forest management. Also, the effort to integrate value chains through PLACCO demands monitoring parameters required to commercialize.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommendations for addressing threats	a. When ejidos are organized with strong governance structures in place, they can address and cope with climate change, fires and drought. b. Conditioning of access or preferential conditions to CCMSS's programs when participation of women, young and settlers is in place in decision processes. c. Peer-to-peer capacity building / knowledge sharing
14.	Additional documents or resources	

	Interviewed Person and Organization: **Andrómeda Rivera, FONDO DE CONSERVACIÓN EL TRUINFO (FONCET)** **Type:** NGO	
1.	Conservation priorities	FONCET was created as a financial mechanism for El Triunfo Reserve. Now it is covering a regional process, but still 80% of the work is done in El Triunfo. 17 years doing forest management (biodiversity conservation as implicit)
2.	Priority geographies	Areas to be restored due to fragmentation of habitat plus areas that have population willing to work. Started operations in La Suiza. This watershed has become a model for management. The objective is to provide connectivity in 119,000 hectares with five core conservation areas (zonas núcleo)
3.	Threats	In El Truinfo: - Agriculture mostly (ranching is only present in the coast) - The communities in El Truinfo are among the highest rates of poverty and social exclusion. High migration to Tijuana, USA and Cancun. Barriers for implementation of projects:

		- Paternalism; public policies that compete instead of complement each other (frequently between conservation and agriculture); clientelism;
4.	Changes in past five years (+ and -)	- SIG Analysis reflects an increase in vegetation cover in El Triunfo. Also, observation of improvement in biodiversity. They don't have data but stakeholders do see an improvement. - Better relations among stakeholders. Trust - Successful governance structures - La Suiza Intercommunitarian Group for Landscape Action (GIAC).
5.	Key institutions (to be created or strengthened)	Programs and initiatives need to strengthen field follow-up. It is usually done only by documents.
6.	Key programs or initiatives	- To address causes of deforestation, restoration through better productive practices (e.g. Conservation Agriculture) - Concurrent funds with CONAFOR for PES as an additional instrument to promote restoration - Capacity building - Inclusion of young population in rural areas and activities. - Provide opportunities based in Ashoka methodology. Seed funding for projects
1.	Key examples on the ground	Also learn from failures: Palma camedor was assumed to have a market value. Replication was done using a single success case (Sierra Moreno). Evaluation of markets was not done beforehand, even though biologically and technically speaking palma camedor is viable for conservation.
2.	Collaboration platforms or initiatives	- Donors (e.g. Citibanamex, Fondo Mexicano, WWF- Carlos Slim Foundation, Kellogg foundation, Rio Arronte Foundation) - Entrepreneurs and businesses in Chiapas conform a FONCET's Financial Committee - CONANP - Beneficiaries of programs - Implementing partners (e.g. Tierra verde, Ecobiosfera, AMBIO)
3.	Enabling conditions	
4.	Gaps (information gaps and intervention gaps)	- Staff that has market knowledge. Biologists are doing market evaluations for projects. - Burdensome permits for extraction of non-timber products - Lack of market evaluations, research and understanding for projects
5.	Monitoring and evaluation tools, mechanisms or criteria	Monitoring of biodiversity (images) but there is no systematization of data (quetzal, jaguar, spider monkey, jahuil, eagle and tapir). ME&L of programs is done according to donors. More systematized monitoring is a pending task that is being done currently. An external evaluation from WWF will help as well.

6.	Key practices (sustainable production and conservation practices)	
7.	Recommendations for addressing threats	- Automatization of processes for better management - Resources for operative costs are difficult to obtain, and without them FONCET cannot perform properly its activities on the ground (e.g. resources for vehicle maintenance) - Improve follow-up and support of projects through time.
8.	Additional documents or resources	Book- *Manejo integrado del paisaje bajo un entorno de Cambio Climático en comunidades de Reserva el Truinfo.*

	Interviewed Person and Organization: **Lesly Aldana, RAINFOREST ALLIANCE** **Type: International Agencies/Donor**	
1.	Conservation priorities	Transform supply chains of companies into sustainable, local and responsible sourcing. 2. Strengthen small agricultural and forestry producers (key commodities coffee, cocoa, fruits and timber, palm) 3. Awareness campaigns directed to final consumers to promote national markets. In a cross-cutting approach: mitigation, inclusion of young people. Focus: conserve forests, but also work in agriculture.
2.	Priority geographies	Campeche, Quintana Roo, Oaxaca, Chiapas, Jalisco, Tabasco, Cd de México. With more funding, RA would direct efforts in Chihuahua, Durango, Puebla
3.	Threats	- Breach of the law - Little capacity of institutions to enforce the law. It is well known where illegal activities are taking place (illegal logging, species extraction, etc). - Budget cuts in the environmental sector - Public programs with scarce coordination and scarce planning
4.	Changes in past five years (+ and -)	
5.	Key institutions (to be created or strengthened)	Mexican companies buying from sustainable producers. Work in partnership with other organizations and boost businesses. Networks & Partnerships. Strengthened forestry sector for formal governance structures and marketing channels.
6.	Key programs or initiatives	1. Productive linkage of ejidos to form a single supply chain. It has been unviable for ejidos to do the whole productive, transformation and commercialization process. Chain of ejidos that are part of a more complex process. This program is oriented mainly to Yucatan Peninsula. Everything is being linked to markets. 2. Linking youth to professional services in the forestry supply chains.

		3. Development of social enterprises made up of indigenous peoples and vulnerable groups (residents -*avecinados*-, and women). Generation of business ideas, support for their development and technical assistance. 4. Bif project in sustainable Agriculture: to transform bad practices and to provide RA's certification on sustainable agriculture 5. As an overarching line of action, RA promotes communication strategies oriented to consumers. Transformation of the private sector in the domestic market by creating consumer awareness. 6. Education for young people and teachers at the upper middle schools in order to link human capital into forestry chains. RA's core business is centered in promotion of sustainable practices and linkage to markets.
7.	Key examples on the ground	Mango production in collaboration with Technoserve.
8.	Collaboration platforms or initiatives	RA wants to articulate private sector needs and on-the-ground processes to offer services that NGOs on the ground are already providing but without interaction with markets. RA foresees its role as a convener of sustainable processes that have already emerged. Its dream team is integrated by companies, local NGOs and farmers, all with well-drafted assistance.
9.	Enabling conditions	Requirement for match and 1 to 1 financing contributions have been a great motivation to scale up and engagement of the private sector. Great interest. Other instruments such as donations from philanthropic areas lack the level of empowerment and appropriation of the private sector. This engagement is seen, for example, in the companies' social media.
10.	Gaps (information gaps and intervention gaps)	- Projects born from welfare programs. Producers do not want to invest in their own plots and don't take advantage of the certification obtained with CONAFOR's assistance. - The ejido structure doesn't allow the inclusion of women and young people who may include new ideas. - Lack of specific financing for: biodiversity, for "brokers" or conveners that promote strategic alliances and collaborative processes, for M&E, and for understanding of markets. - Promotion of sustainable productive corridors. - For Tren Maya, develop a comprehensive and well-thought investment/infrastructure project.
11.	Monitoring and evaluation tools, mechanisms or criteria	RA globally has an internal management system. At a country level, monitoring is done at project level. Indicators include productivity, surface under good practices, people trained, companies constituted, amounts of sales made, GHG avoided, trees planted, and area under restoration. RA has no indicators regarding biodiversity. Their suggestion is to monitor biodiversity through specific funding and find cost-effective measurement method.
12.	Key practices (sustainable production and conservation practices)	- Sustainable forest management - Coffee production and supply chains - Cocoa production and supply chains - Soil restoration

13.	Recommendations for addressing threats	- Specific financing for biodiversity, M&E, understanding of markets. - Financing for the role of "brokers" or conveners that promote strategic alliances and collaborative processes. - Promotion of sustainable productive corridors.
14.	Additional documents or resources	

Producers

	Interviewed Person and Organization: **Mauricio González _UMAS Crocodile** **Type: Expert**	
1.	Conservation priorities	1. Conservation and sustainable use of wildlife 2. Show the benefits of sustainable use schemes 3. Provide technical assistance to other UMAs
2.	Priority geographies	Yucatan Peninsula
3.	Threats	Habitat destruction Illegal Exploitation Pollution - in the case of wild crocodile populations, as they jeopardize their reproductive success
4.	Changes in past five years (+ and -)	Currently, SEMARNAT authorizes the uses in UMA scheme. However, support is limited and does not cover the country's demand, neither in the promotion of the scheme, nor in the maintenance to establish itself as a business.
5.	Key institutions (to be created or strengthened)	Program for the Promotion and Conservation of Wildlife – SEMARTAT. It was a success because many UMAs were able to consolidate as businesses.
6.	Key programs or initiatives	Rancheo Pilot Program - CONABIO, provides an alternative of wild use of crocodile eggs aimed at communities and with the opportunity to connect to a supply chains.
7.	Key examples on the ground	Lesson learned: programs in Mexico are well-planned initiatives, with good technical support. However there are many challenges in the implementation due to corruption and lack of resources.
8.	Collaboration platforms or initiatives	Union of UMAS, SEMARNAT, CONABIO, CONANP, UICN
9.	Enabling conditions	Markets and permissions
10.	Gaps (information gaps and intervention gaps)	Traceability
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	Captive reproduction
13.	Recommendations for addressing threats	Market development
14.	Additional documents or resources	

	Interviewed Person and Organization: **Project: Mieles y Ceras de Campeche**

	Type: Producers	
1.	Conservation priorities	Forest conservation
2.	Priority geographies	Campeche
3.	Threats	Forest cover loss Use of insecticides Fall of international prices of honey Diseases Water scarcity
4.	Changes in past five years (+ and -)	Lack of technical support for very small producers (less than 20 hives)
5.	Key institutions (to be created or strengthened)	CONANP, CONABIO, SADER
6.	Key programs or initiatives	PROGAN
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	
9.	Enabling conditions	Best Prices, Rain
10.	Gaps (information gaps and intervention gaps)	Technical support
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	Use of secondary forest in beekeeping activity
13.	Recommendations for addressing threats	Prohibit use of insecticides such as glyphosate in the Yucatan Peninsula
14.	Additional documents or resources	

	Interviewed Person and Organization: **Nuevo BEKAL** **Type: Producers**	
1.	Conservation priorities	- forest management - carbon production - seed production - beekeeping production - UMA hunting - cornfield systems
2.	Priority geographies	Campeche
3.	Threats	Climate changes, extreme events low price – timber, honey, charcoal Illegal timber and coal market competition
4.	Changes in past five years (+ and -)	- Modification of Rules of operation of public programs (CONAFOR, CONANP, SADER, SEDATU, SEMARNAT) - Climate Change - *Tren Maya* - *Sembrando Vida*
5.	Key institutions (to be created or strengthened)	CONAFOR, CONANP, SADER, SEDATU, GIZ
6.	Key programs or initiatives	CONANP
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	CONANP, UMAS
9.	Enabling conditions	

10.	Gaps (information gaps and intervention gaps)	- Non-traditional timber value chains, certified carbon market, suitable technologies for carbon production - Technical studies to determine the load capacity for hunting UMAs - Timber traceability - Invasion of neighbors - Introduction of invasive species in pastures - Governance of ejido groups
11.	Monitoring and evaluation tools, mechanisms or criteria	
12.	Key practices (sustainable production and conservation practices)	UMAS, adaptive forest management, regeneration using new forest management practices
13.	Recommendations for addressing threats	
14.	Additional documents or resources	

US Government

	Interviewed Person and Organization: **Marcelo Norsworthy, Development Credit Authority (DCA)** **Type: US Government**	
1.	Conservation priorities	Priorities are set by USAID and the Mission. DCA concentrates in providing loan and guarantees for development projects that are important to the Mission. DCA covers a sector that commercial banks perceive as riskier. DCA mitigates that risk through loan guarantees for underserved borrowers.
2.	Priority geographies	DCA is not restricted to a specific sector, nor geography. It is driven by the Mission's needs and Mission's projects.
3.	Threats	For DCA operation: Two main parts for identifying lending partners: a) Strategic alignment between USAID's priorities and goals and the financial institution's goals; b) an adequate size (not too small nor too big). Relationships and loans range from 1.5 to 15 years. The market changes and could be changes in strategy. It is difficult to have a valid alignment during the life of the guarantee. Amendment of guarantees can be done during this period of time. There is also flexibility to redirect geography.
4.	Changes in past five years (+ and -)	
5.	Key institutions (to be created or	

	strengthened)	
6.	Key programs or initiatives	In Mexico, two financial institutions working since 2016: Findeca and Finlogra. Both of them finance sustainable productive practices in the rural sector (e.g. shade grown coffee- to expand their businesses). Finlogra has not given any loans due to lack of capital or lines of credit. Findeca has US$ 5 million in its portfolio and US$2.6 million in loans until 2030. The objective is to promote sustainable agriculture and rural activities. Operations are mainly concentrated in Oaxaca, Chiapas and Yucatan Peninsula. DCA can't guarantee sovereign funds but is able to work with state governments (e.g. Oaxaca) or municipalities. Guarantee is with the lenders. Credit users usually don't even know DCA is mitigating the risk, but frequently interest rates are lower.
7.	Key examples on the ground	
8.	Collaboration platforms or initiatives	Opportunity: Use these financial mechanisms to form collaborative partnerships with private sector and value chains. Think more broadly in different areas of the value chain, not only directly to farmers but also work with supplier of inputs, etc.
9.	Enabling conditions	Opportunity: As part of the Bill Act, DCA office is leaving USAID and joining OPIC to form a single unit. This new unit (*U.S. International Development Finance Corporation* ("*DFC*") will the capabilities of OPIC and DCA. Therefore, it will be able to provide other financial products such as risk insurance, direct loans, lines of credit, etc. It will be launched in October 2019 and will have a transition period.
10.	Gaps (information gaps and intervention gaps)	Technical assistance to help farmers or credit users either in the technical side or the production side to overcome difficulties and have a successful project. This in turn provides better conditions for repayment and less risk to credit institutions. USAID could do this by providing a package deal (DCA guarantee linked to credit + technical assistance for improved productive and organizational practices). Also, USAID could work with other development agencies if the Mission is not able to fund this assistance directly. Regarding carbon markets, there is an opportunity to provide guarantees in other markets. Upstream in the financial sector. Capitalize other financial institutions.
11.	Monitoring and evaluation tools, mechanisms or criteria	DCA uses high level metrics. Interest rates, amount of credit, etc. Still there is a need to strengthen M&E in order to think more holistically regarding the impact that DCA has on the projects and to communicate better. Data collection and use of that data for M&E. It is up to the mission to measure biodiversity, GHG, etc.
12.	Key practices (sustainable production and conservation practices)	
13.	Recommend ations for	DCA doesn't have expertise in each branch of USAID area. It is difficult to bridge different programs. They need a champion within each program to integrate DCA's

	addressing threats	solutions into the pipeline of their projects. Training in the Mission for the Mission to understand the type of tools available through DCA and now DFC. The Mission is the first contact and people to identify the gaps where financial tools can be used.
14.	Additional documents or resources	

	Interviewed Person and Organization: **Diana Blanco, Director of Rule of Law USAID** **Type: Government of US**	
1.	Program Priorities	- Consolidate the accusatory judicial system in Mexico: transition from inquisitive to accusatory system between 2008-2016 - Technical assistance to SETEC - Increase the efficiency and effectiveness of criminal and civil justice system, including developing analytical ability, improving victim's access to justice, and building public support for criminal justices reforms - Work with courts, defense actors and prosecutors - Work with civil society and private sector actors to support public outreach and buy-in - Evaluation and monitoring mechanisms - Alternative mechanisms for conflict solving to reduce the burden for attorneys and courts - Harmonize the prosecution/conviction chain with the penalty procedures code.
2.	Geographies	- Baja California, Baja California Sur, Coahuila, Chihuahua, Jalisco, Morelos, Nayarit, Nuevo León, San Luis Potosí, Sonora, Tabasco Zacatecas
3.	Threats and Challenges for Biodiversity related with your program of work	- No conservation priorities in the program and no evident relationship between the program and biodiversity/forest -
4.	Main threats to biodiversity/forest or the target area of your program,	- Organized crime - Impunity: cases are not leading to convictions - Every state has its own particular situation - Lack of coordination within institutions and among authorities
5.	Collaboration with other DO	- Human Rights - Violence prevention - Transparency and processes
6.	What have worked well or have not work well during those collaborations?	
7.	What do you see as the best way forward integrating and implementing biodiversity and forest conservation/sustainable management in your	- There is potential for exploring work in environmental justice, particularly addressing the situation environmental defender who have been persecuted and murdered.

	program? Please explain and give examples.	

	Interviewed Person and Organization: **Indira Villegas, Crime and Violence Prevention USAID** **Type: Government of US**	
1.	Program Priorities	- Prevention models based on evidence: strengthening local authorities' commitment to tackle crime and violence - Provide support to youth with high detention risk for minor crimes or administrative felonies. - Build community cohesion, and improve job opportunities for at-risk youth - Cognitive behavioral therapy, crime prevention through environmental design. - Local system approach: demand driven
2.	Geographies	- 14 municipalities: most violence-affected cities, especially on the border
3.	Actors	- Governments: Federal security institutions, state and local governments - Civil society: communities and associations - Private sector and academia
3.	Achievements	- Recidivism rate of only 1.2% in the youth at risk targeted areas of USAID compared with 60% at the national level - 70% of at risk youth have a formal job and or are enrolled in school - Reduction of risk factors who make them susceptible to crime by 70% - All civil societies in the program have adopted practices in crime and violence prevention in
4.	Threats and Challenges for Biodiversity related with your program of work	- No relationship is found between the program and illegality in biodiversity and forest issues - The program operates in urban areas with no relation to forest or biodiversity illegal activities. There has not been a single case of crime/violence related to these issues. - Illegal activities in biodiversity and forest issues are managed by different police and prosecution authorities and actors from the ones the DO1 program works with.

USAID
FROM THE AMERICAN PEOPLE

ANALYSIS OF TROPICAL FORESTS AND BIODIVERSITY IN MEXICO

Cartographic Annex

October 3, 2019

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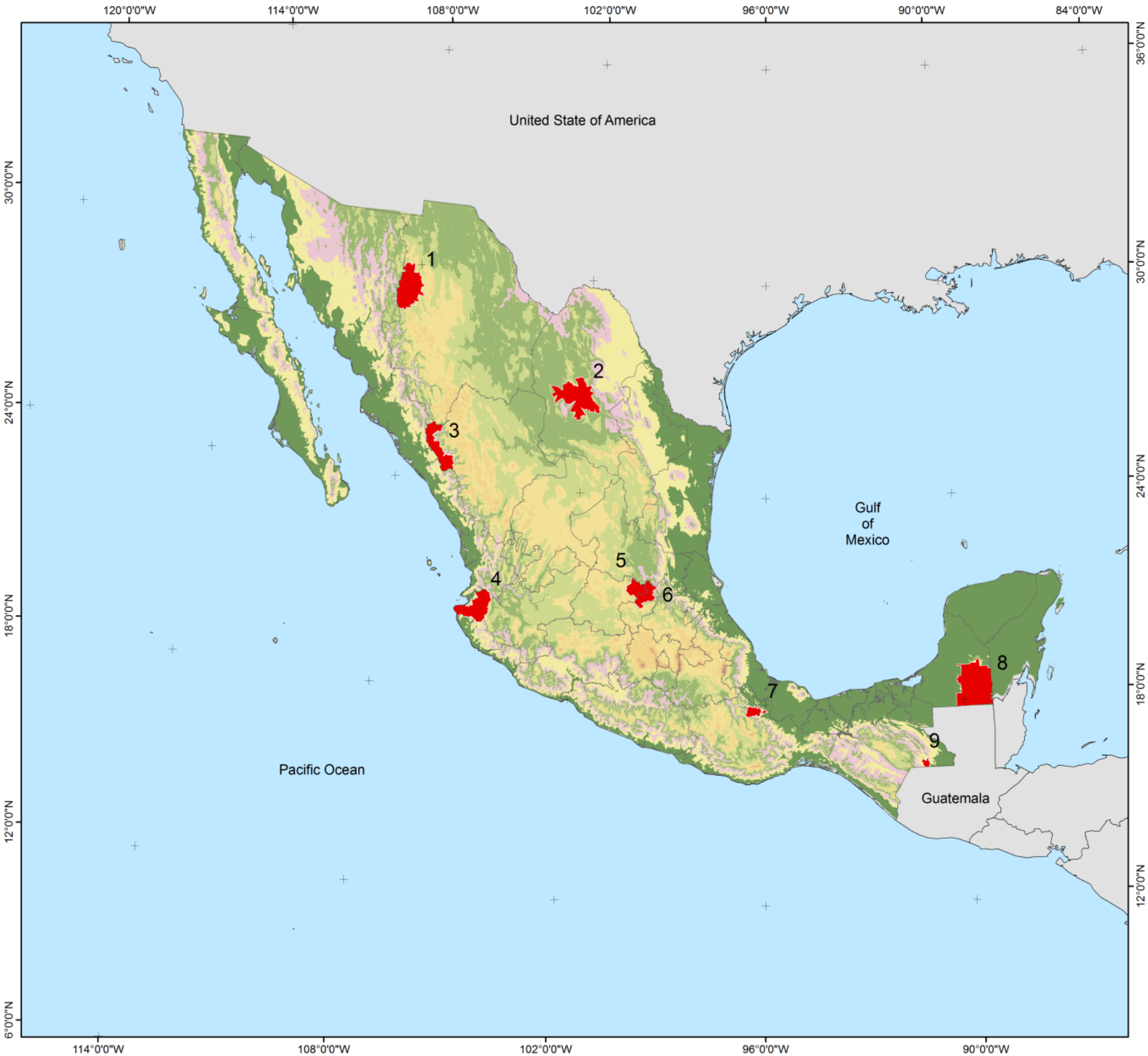
Map of selected priority areas



LEGEND

State boundaries

Priority areas

Model Terrain

0 a 200

1000 a 1500

1500 a 2000

200 a 500

2000 a 2500

2500 a 3000

3000 a 3500

3500 a 4000

4000 a 4500

4500 a 5000

500 a 1000

> 5000

Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Muñoz, E .; Martínez, M.E.; Overa, M. y Lendo, E. 2019. Priority areas. México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Ecosystem Integrity

LEGEND

Level

- Very High
- High
- Medium
- Low
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source:Equihua, M. et al. 2016. Integridad ecosistémica. 2004. Resolución espacial 1: 1,000. No publicado. Proyecto apoyado por: Unión Europea/ROBIN, Instituto de Ecología A.C., Conabio Conafor

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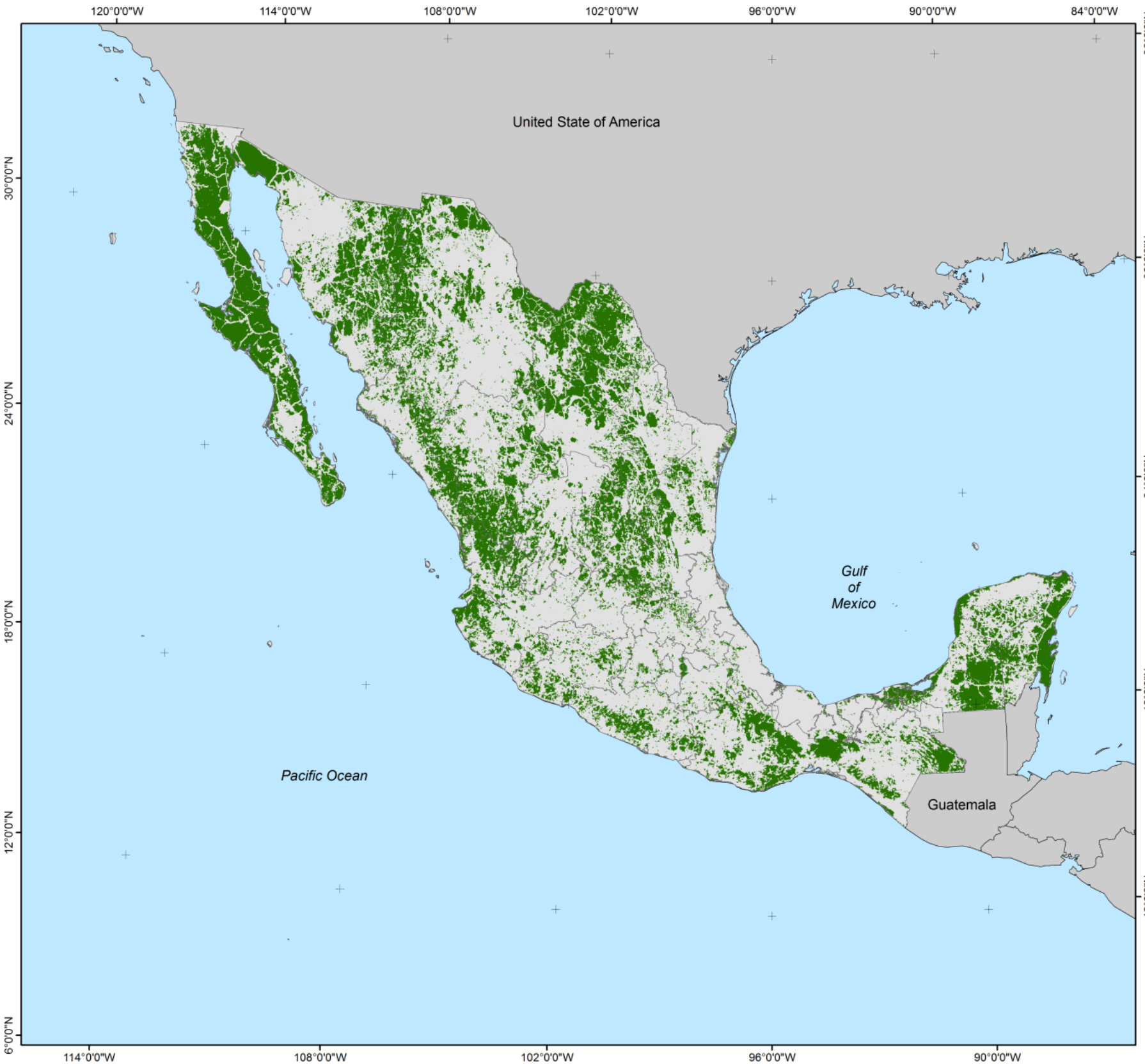
Priority Attention Sites due to Biological Richness



LEGEND

- Priority Attention Sites due to Biological Richness
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Conabio. 2016. Sitios de atención prioritaria para la conservación de la biodiversidad.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

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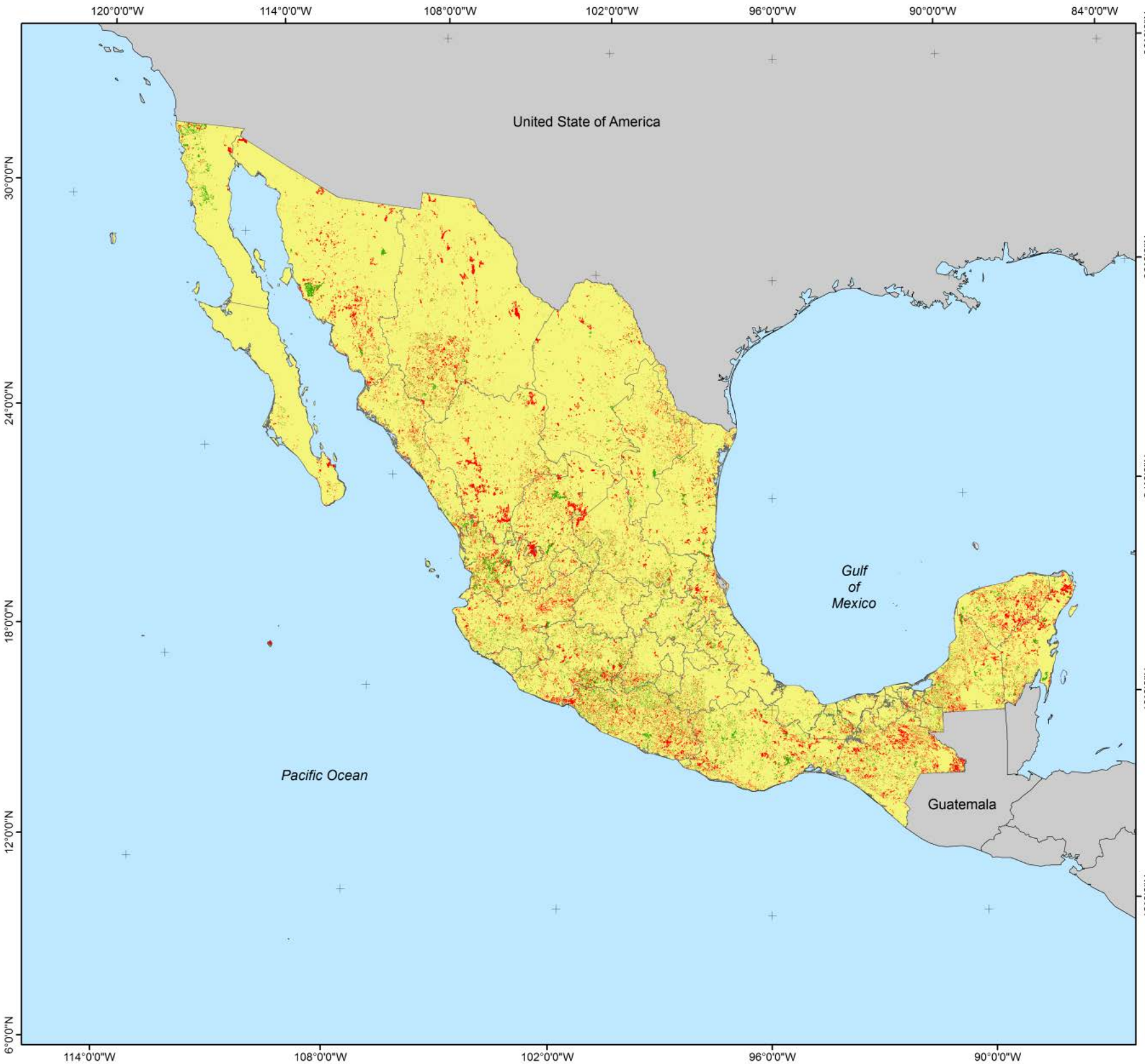
Linear Unit:	Meter

Changes between Series III Series VI (Gain and Loss of Forests)



LEGEND

State border

Type of change

- Gain
- No change
- Loss
- N/A
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Enrique Muñoz López 2019. Cambios en la cobertura de los ecosistemas de México (2002-2015).

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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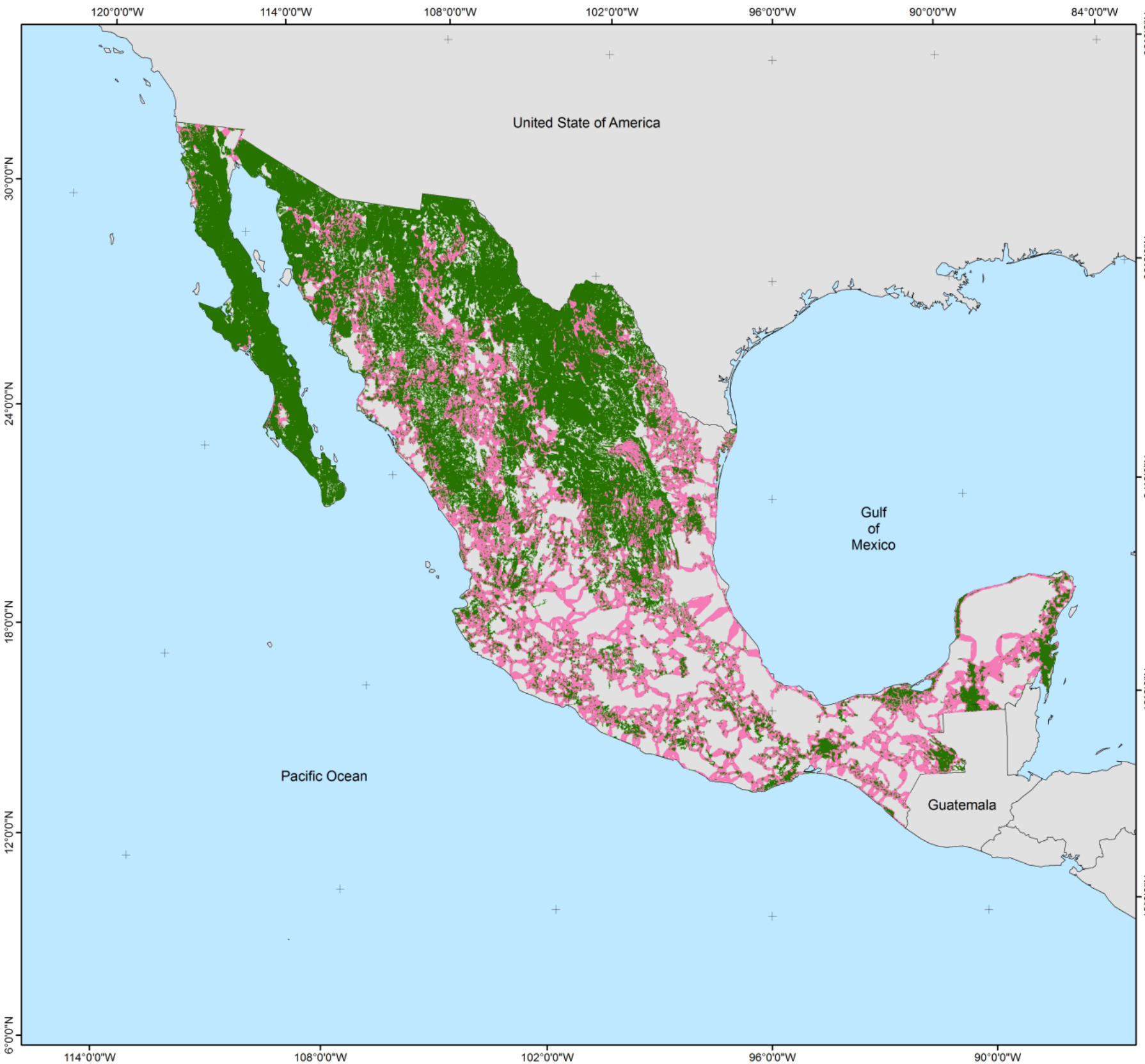
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Climate corridors for biodiversity conversation



LEGEND

Climate corridors for biodiversity conversation

- Climate Corridors
- Fragment of primary natural vegetation
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Conabio, Conanp y Pnud. 2019. Corredores climáticos para la conservación de la biodiversidad. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad - Comisión Nacional de Áreas Naturales Protegidas - Programa de Naciones Unidas para el Medio Ambiente, México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

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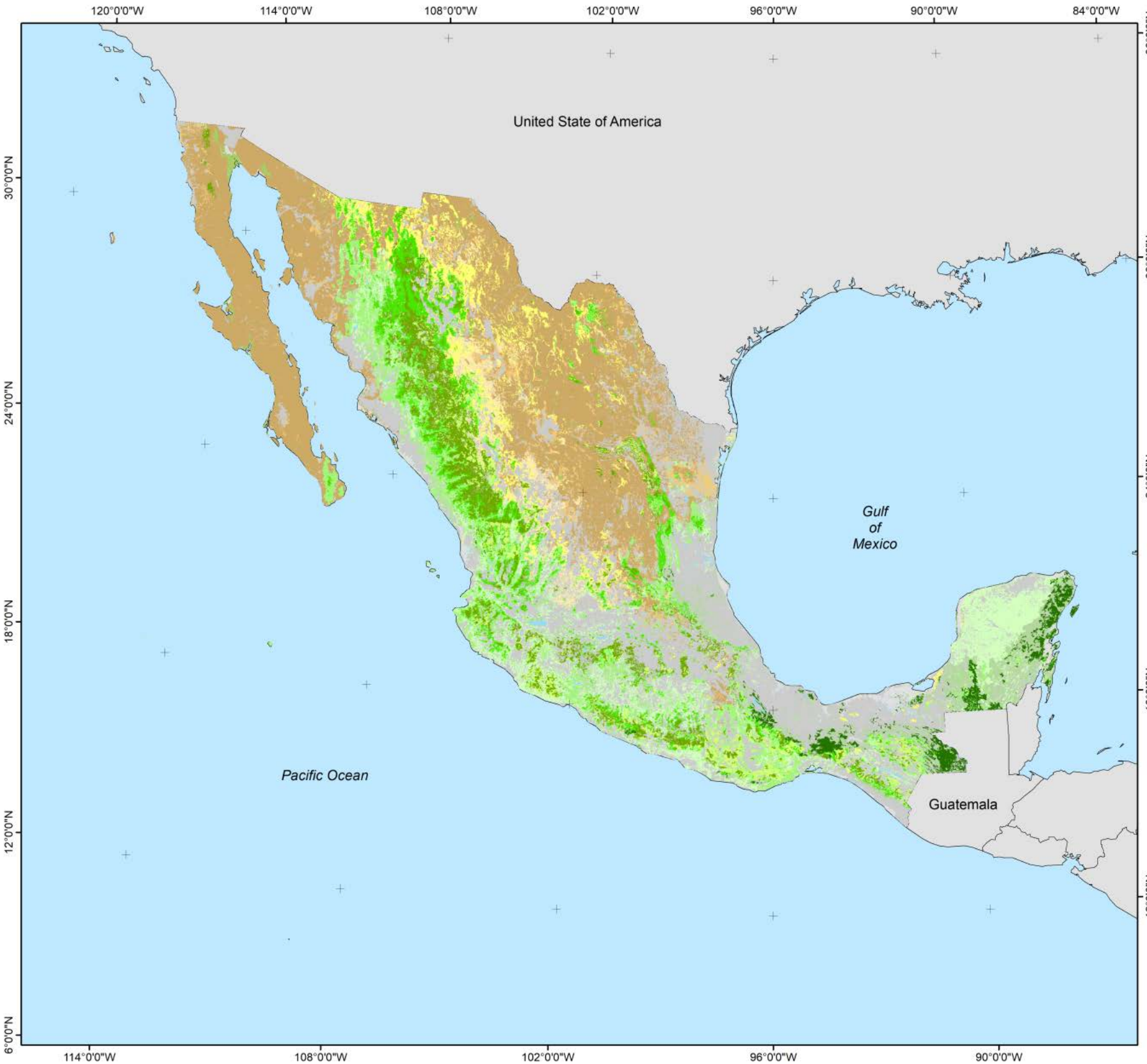
Linear Unit:	Meter

Land Use Vegetation Ecosystems Series III (Primary and secondary vegetation)



LEGEND

Land Use and Ecosystems

- Coniferous forest
- Broadleaf forest
- Water
- Xerophilous scrub
- Other vegetation types
- Grassland
- Rain forest
- Dry forest
- Antropic use
- Aquatic vegetation
- Secondary coniferous forest
- Secondary broadleaf forest
- Secondary xerophilous scrub
- Secondary other vegetation types
- Secondary grassland
- Secondary rain forest
- Secondary dry forest
- Secondary aquatic vegetation
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Enrique Muñoz López 2019. Ecosistemas de México en 2002.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

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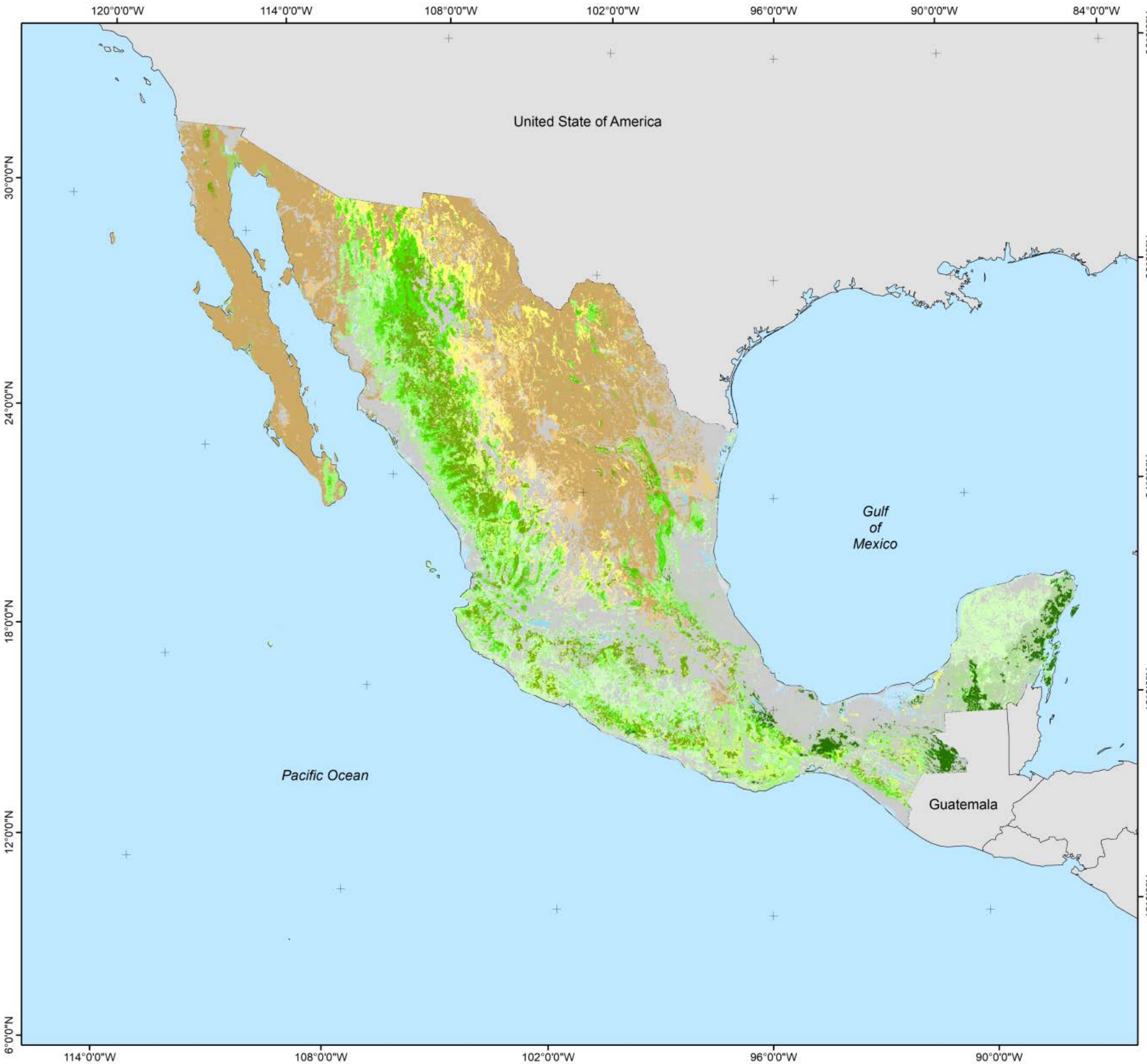
Linear Unit:	Meter

Land Use Vegetation Ecosystems Series IV (Primary and secondary vegetation)



LEGEND

Land Use and Ecosystems

- Coniferous forest
- Broadleaf forest
- Water
- Xerophilous scrub
- Other vegetation types
- Grassland
- Rain forest
- Dry forest
- Antropic use
- Aquatic vegetation
- Secondary coniferous forest
- Secondary broadleaf forest
- Secondary xerophilous scrub
- Secondary other vegetation types
- Secondary grassland
- Secondary rain forest
- Secondary dry forest
- Secondary aquatic vegetation
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Enrique Muñoz López 2019. Ecosistemas de México en 2015.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Areas under agricultural land use

LEGEND

Agricultural land use

Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: SIAP (Servicio de Información Agroalimentaria y Pesquera) 2014. Cobertura Nacional de Frontera Agrícola Serie II. México. SAGARPA (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación).

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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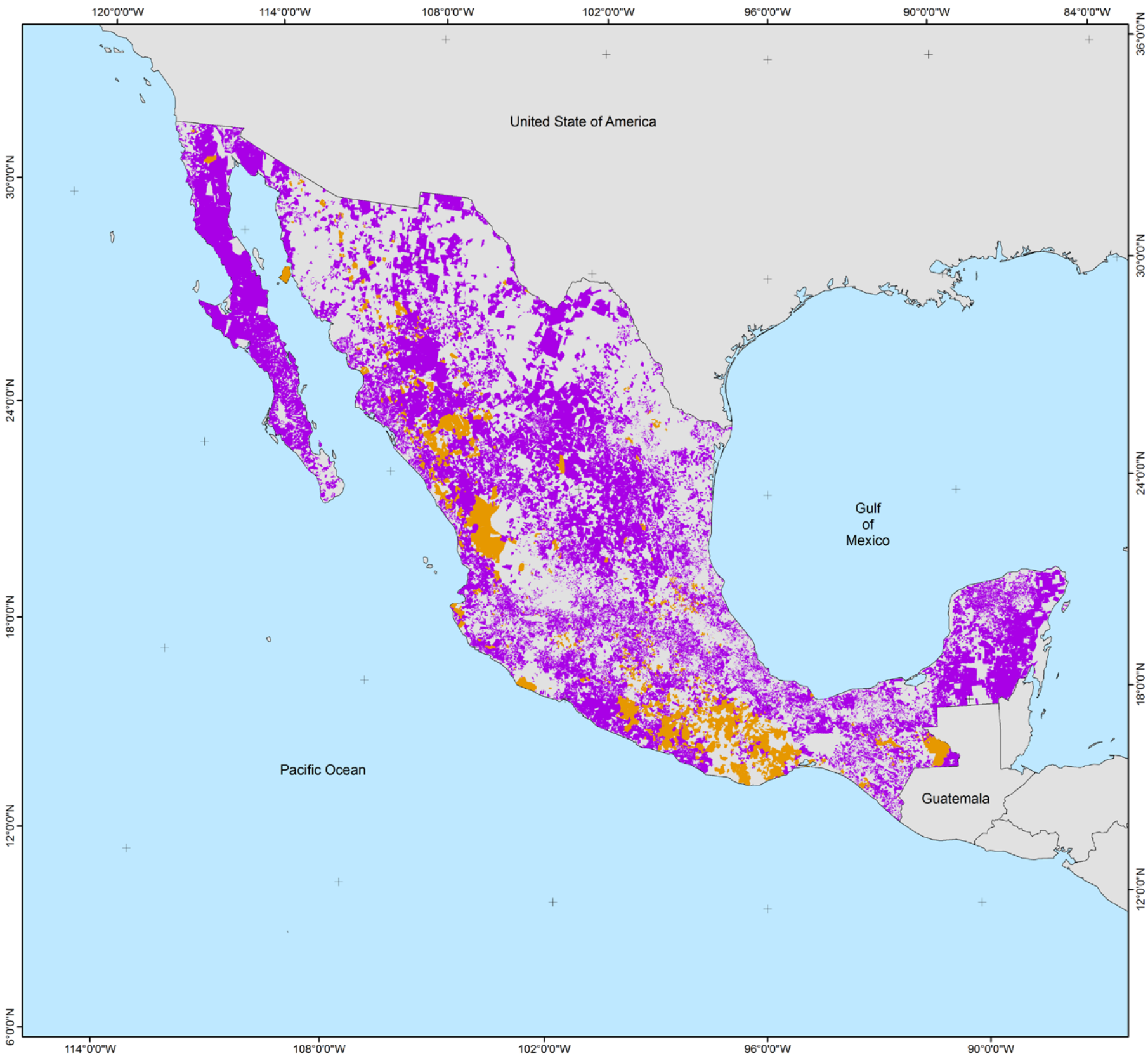
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Agrarian Nuclei (R A N)



LEGEND

Kind of property

- Communities
- Ejidos
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Registro Agrario Nacional. R A N. México

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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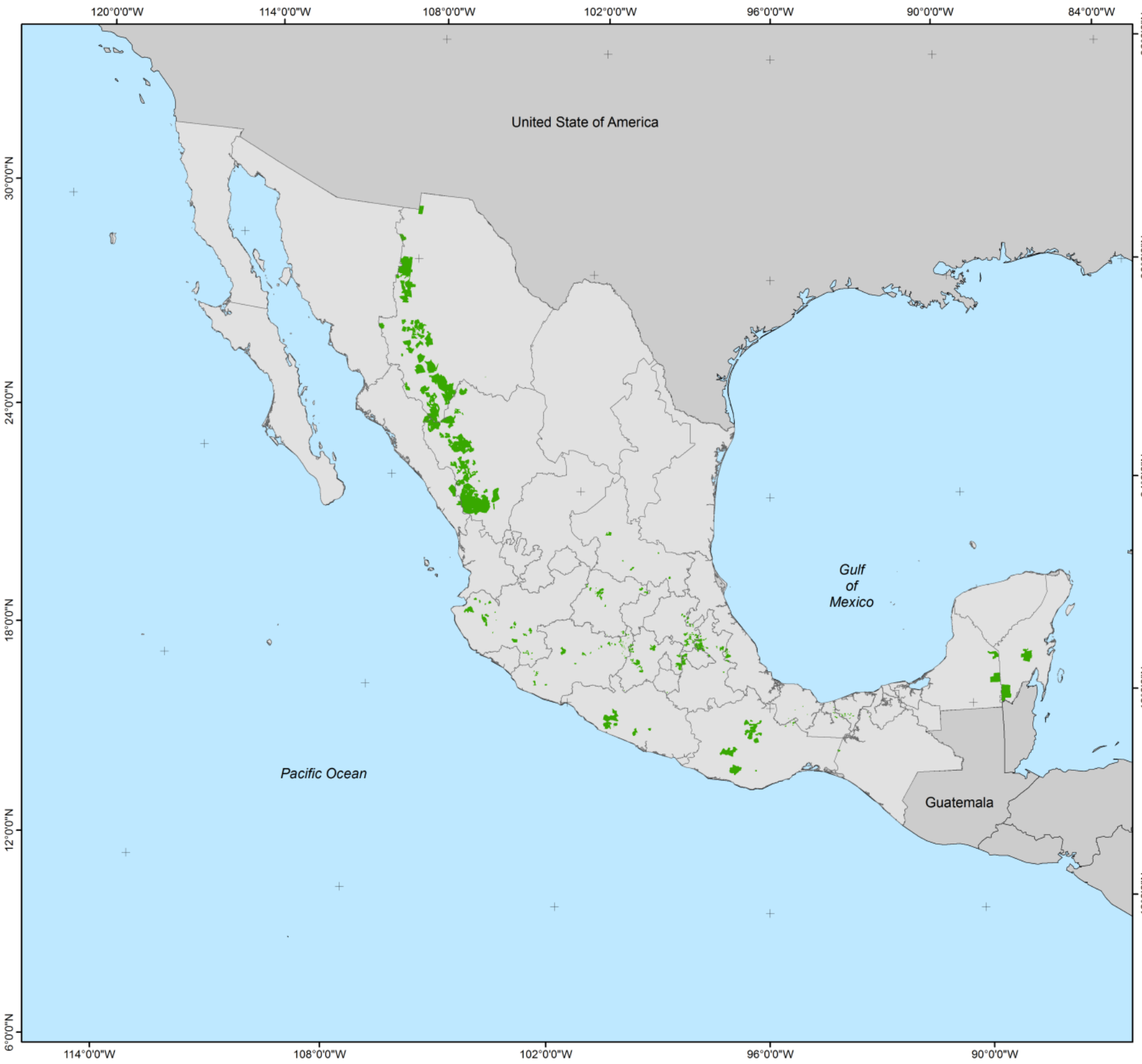
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Certified and in process lands of forest certification in Mexico



LEGEND

- Certified and in process lands of forest certification in Mexico
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: CONAFOR. 2016. Padrón de predios certificados y en proceso de certificación en México

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
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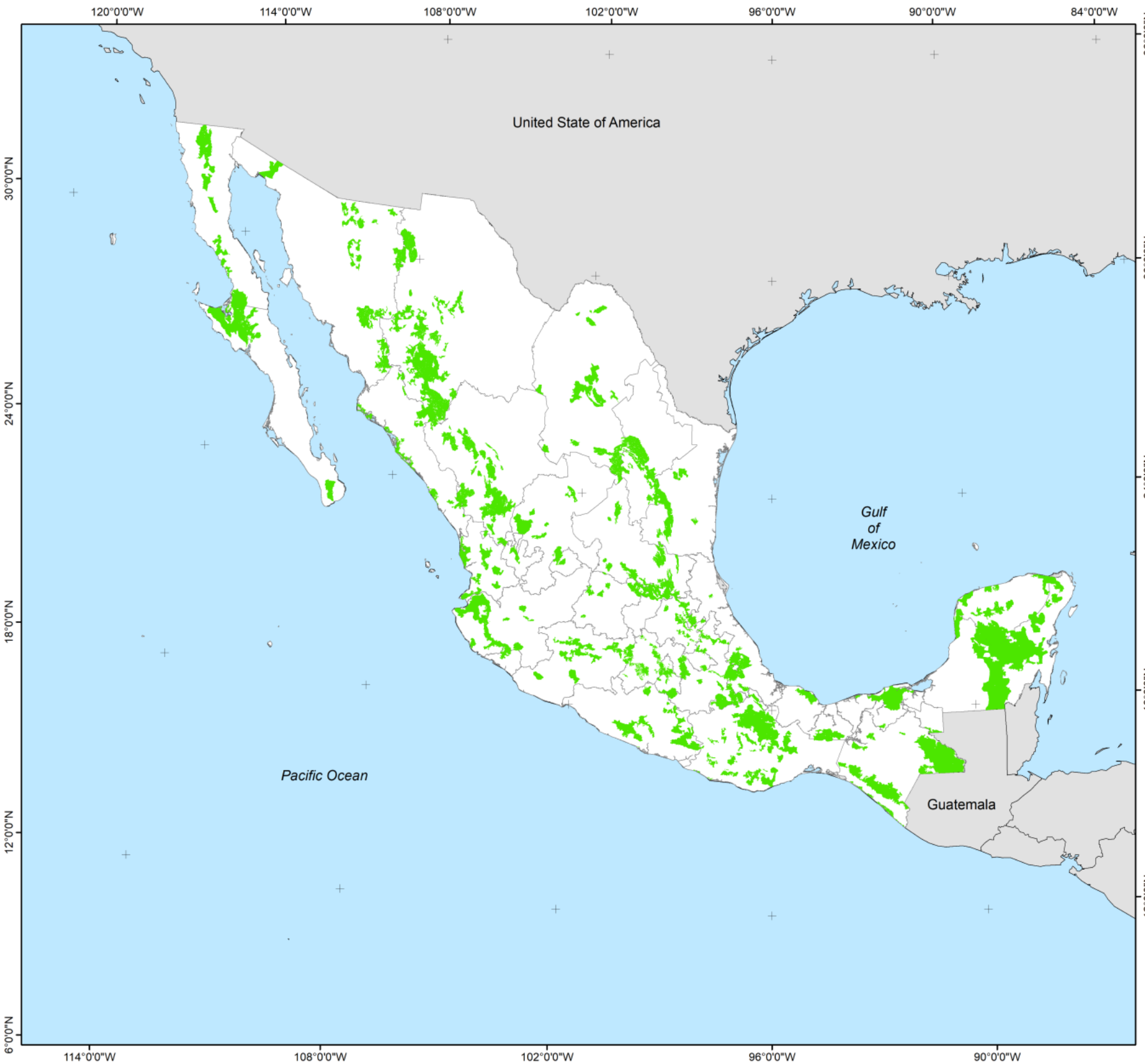
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Payments for Environmental Services (PES) 2018



LEGEND

- Eligible Areas
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

CONAFOR (Comisión Nacional Forestal) 2018. Áreas Elegibles 2018-Nacional, Componene V. Servicios Ambientales. Ciudad de México, México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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False_Northing:	0.00000000
Central_Meridian:	-96.00000000
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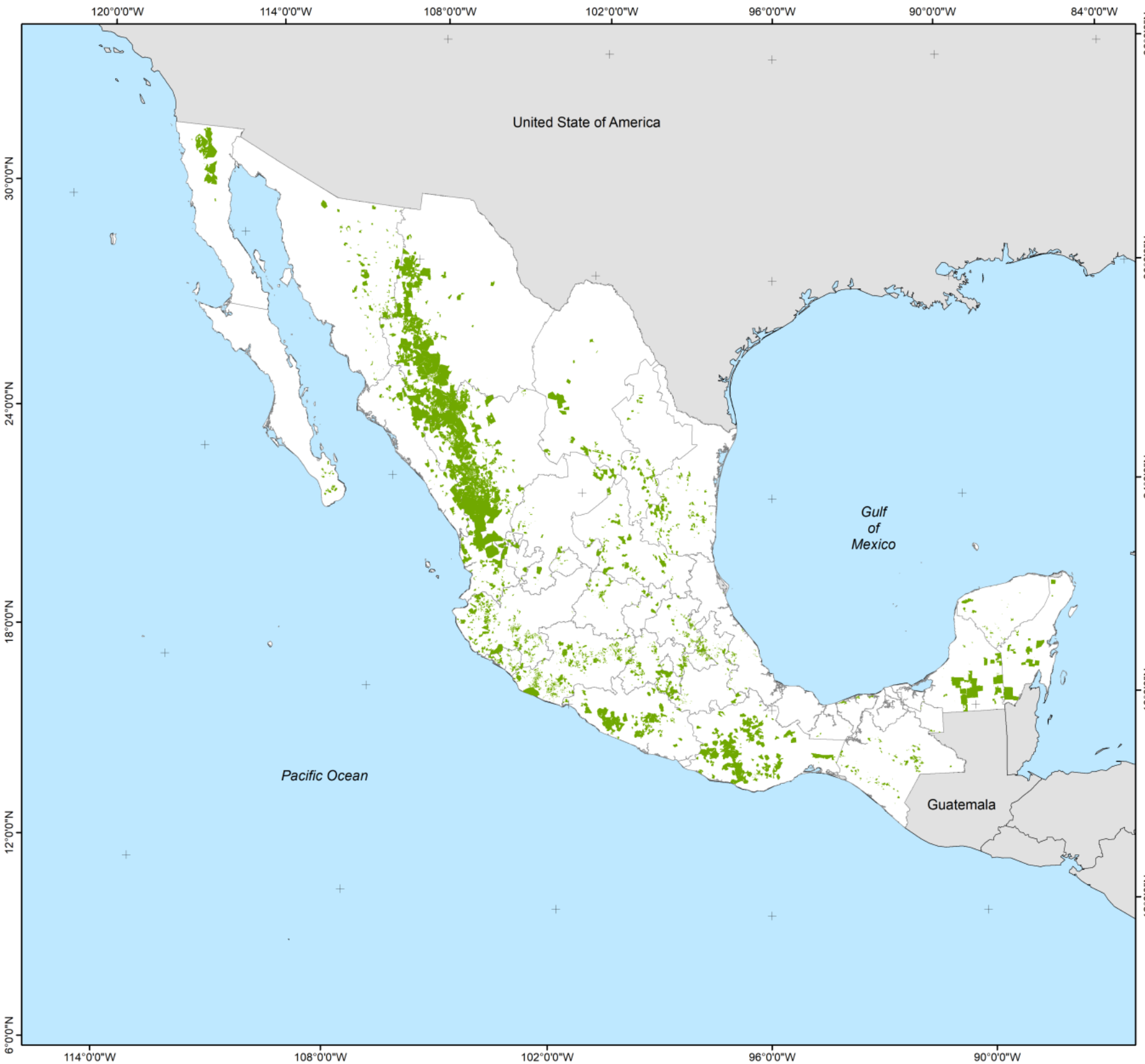
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Plots under Forest Management



LEGEND

- Plots
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

CONAFOR (Comisión Nacional Forestal) 2016. Predios bajo manejo forestal certificado en México

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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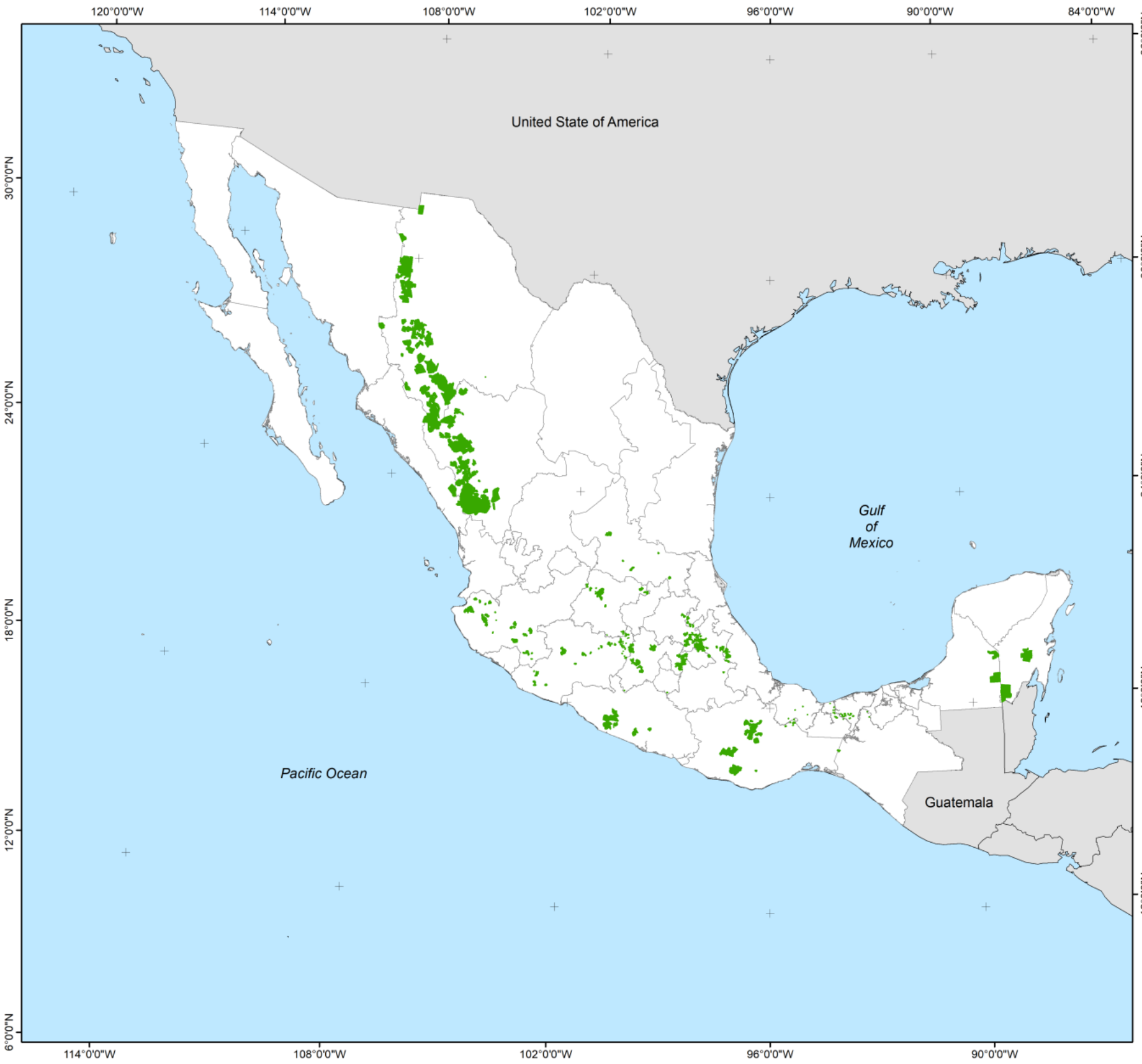
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Plots with national certifications for forest management



LEGEND

- Plots with certifications
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

CONAFOR (Comisión Nacional Forestal) 2016. Padrón de predios certificados y en proceso de certificación en México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Permanent Forest Areas (dedicated exclusively to sustainable forestry)

LEGEND

- Forest areas
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Bezaury-Creel J.E., L.M. Ochoa-Ochoa. J.Fco. Torres-Origel, 2012. Base de Datos Geográfica de Predios con Áreas Forestales Permanentes en México- Versión 2.0, 12/2011. The Nature Conservancy. 8 Capas ArcGIS 9.2 + 4 Capas Google Earth KMZ + 1 Archivo de Metadatos en texto. En: Bezaury- Creel J.E., J.Fco. Torres-Origel, L.M, Ochoa-Ochoa, M. Castro-Campos. 2012. Áreas Naturales Protegidas y Otros Espacios Destinados a la Conservación, Restauración y Uso Sustentable de la Biodiversidad en México. The Nature Conservancy-México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
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Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Areas Voluntarily Destined to Conservation (A D V C)

LEGEND

- Areas Voluntarily Destined to Conservation
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Comisión Nacional de Áreas Naturales Protegidas. México. 2019

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Areas for forest landscape restoration

LEGEND

Restoration level

- High
- Medium
- Low
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: CONABIO-UICN, (15/12/2012). 'Sitios de atención para restauración del paisaje forestal en México', escala: 1:1000000. edición: preliminar. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Unión Internacional para la Conservación de la Naturaleza. México, D.F..

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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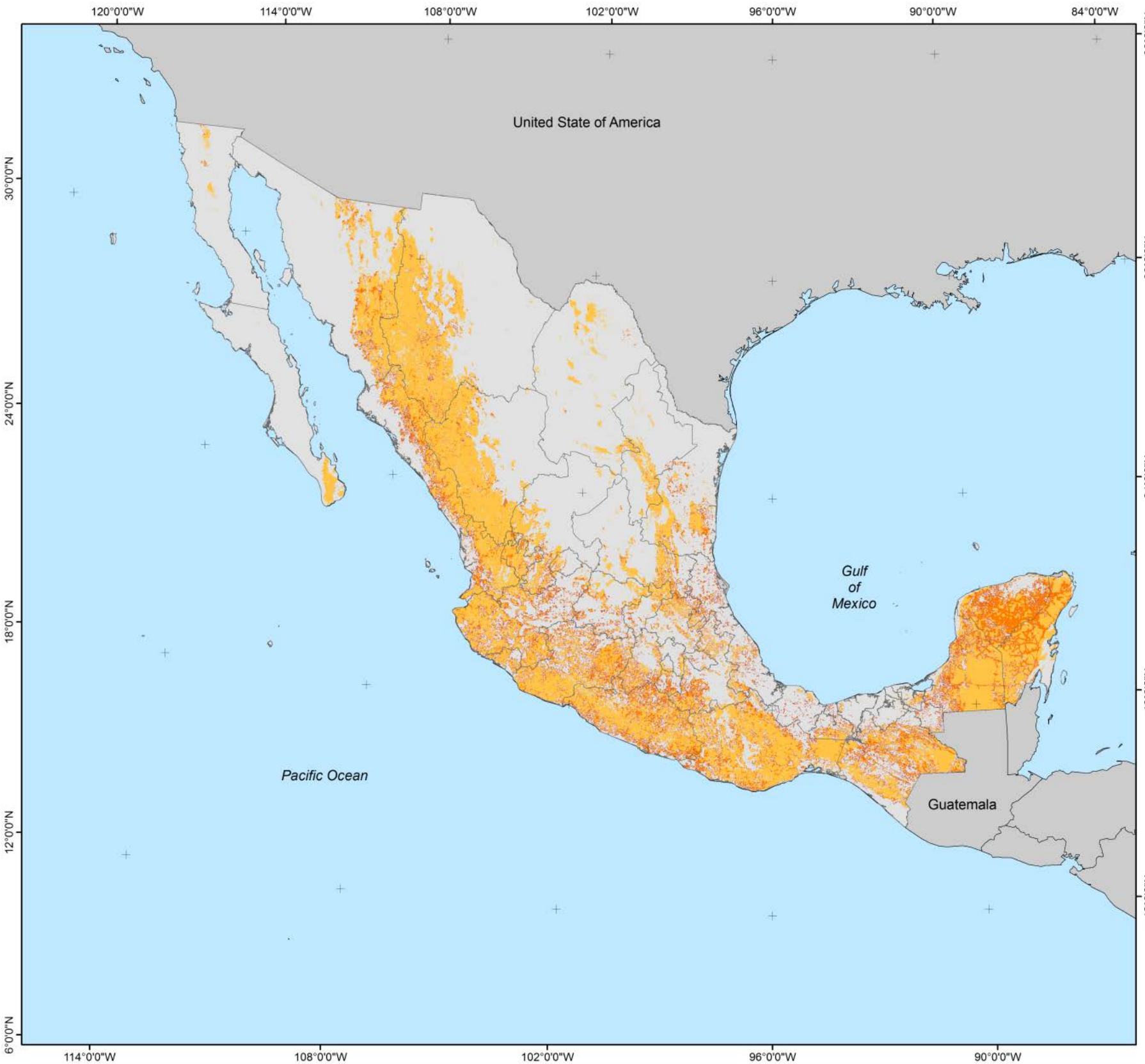
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Economic pressure to deforestation index



LEGEND

- Low
- Medium
- High
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: INECC. 2018. índice de Presión Económica a la Deforestación en México

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
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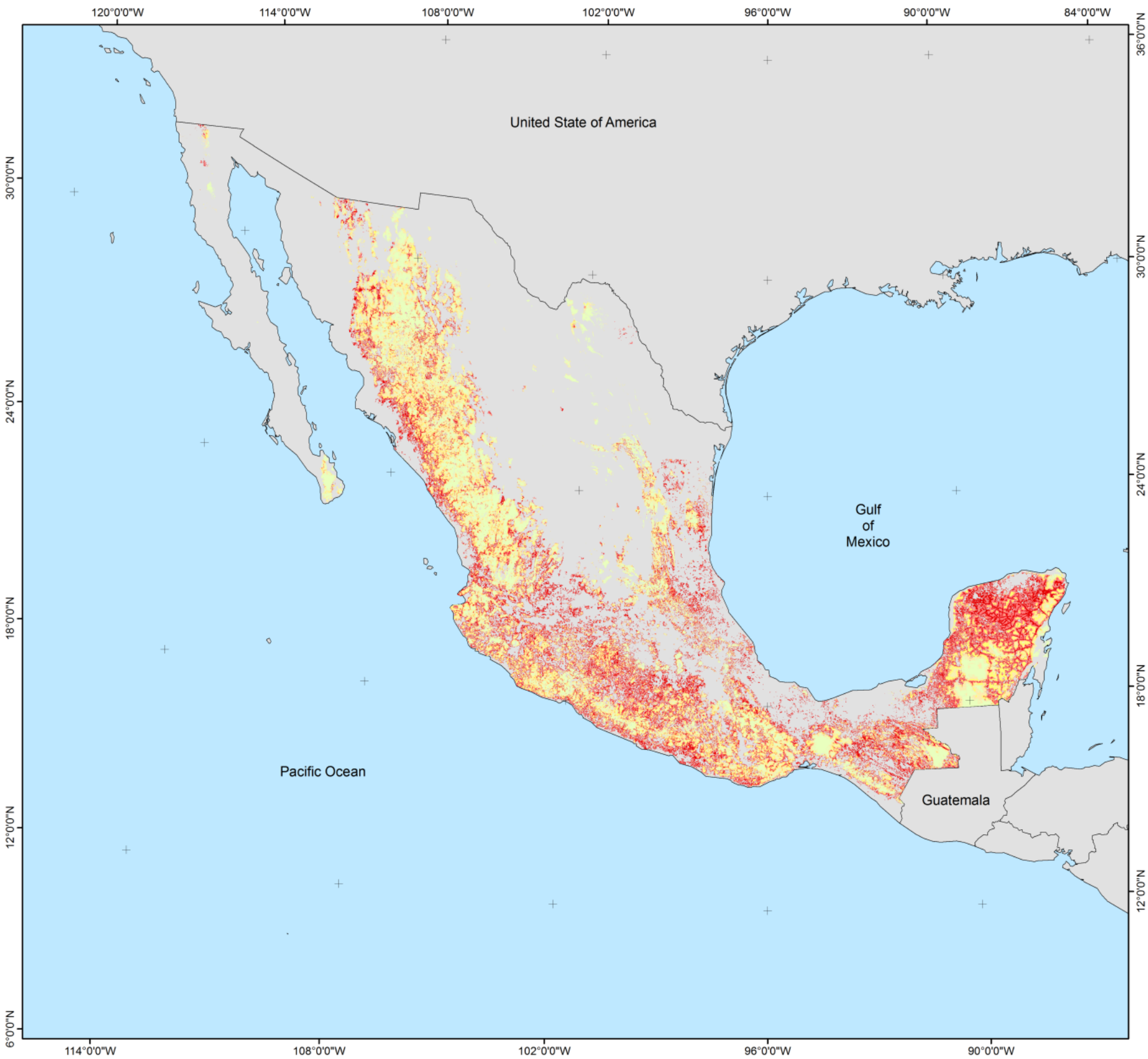
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Deforestation Risk index



LEGEND

Level.

- Very high
- High
- Medium
- Low
- Very Low
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: (Instituto Nacional de Ecología) 2011. índice de Riesgo o de Probabilibad de Deforestación

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
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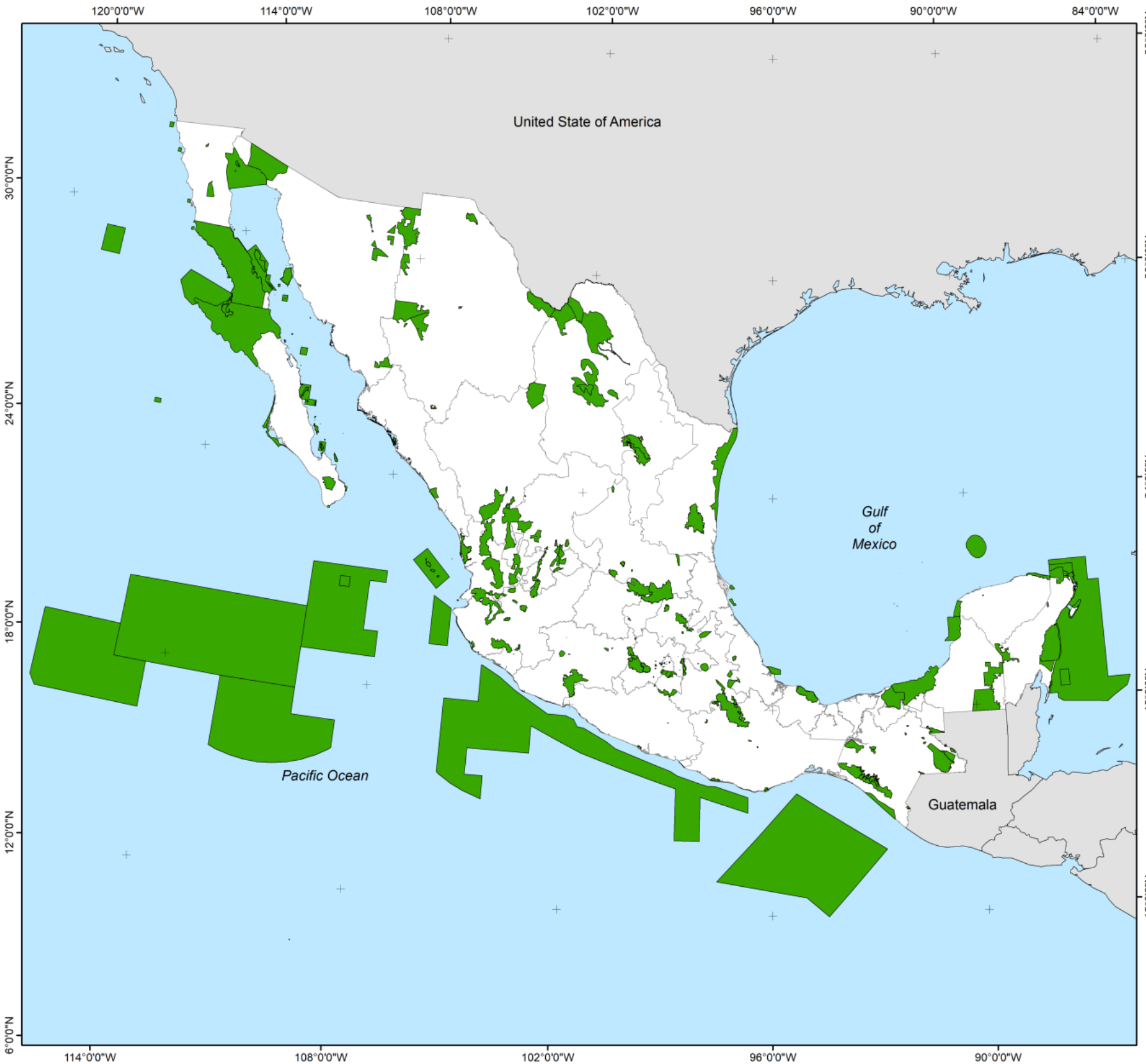
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Natural Protected Areas (NPA) – Federal 2019



LEGEND

- Protected Areas
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

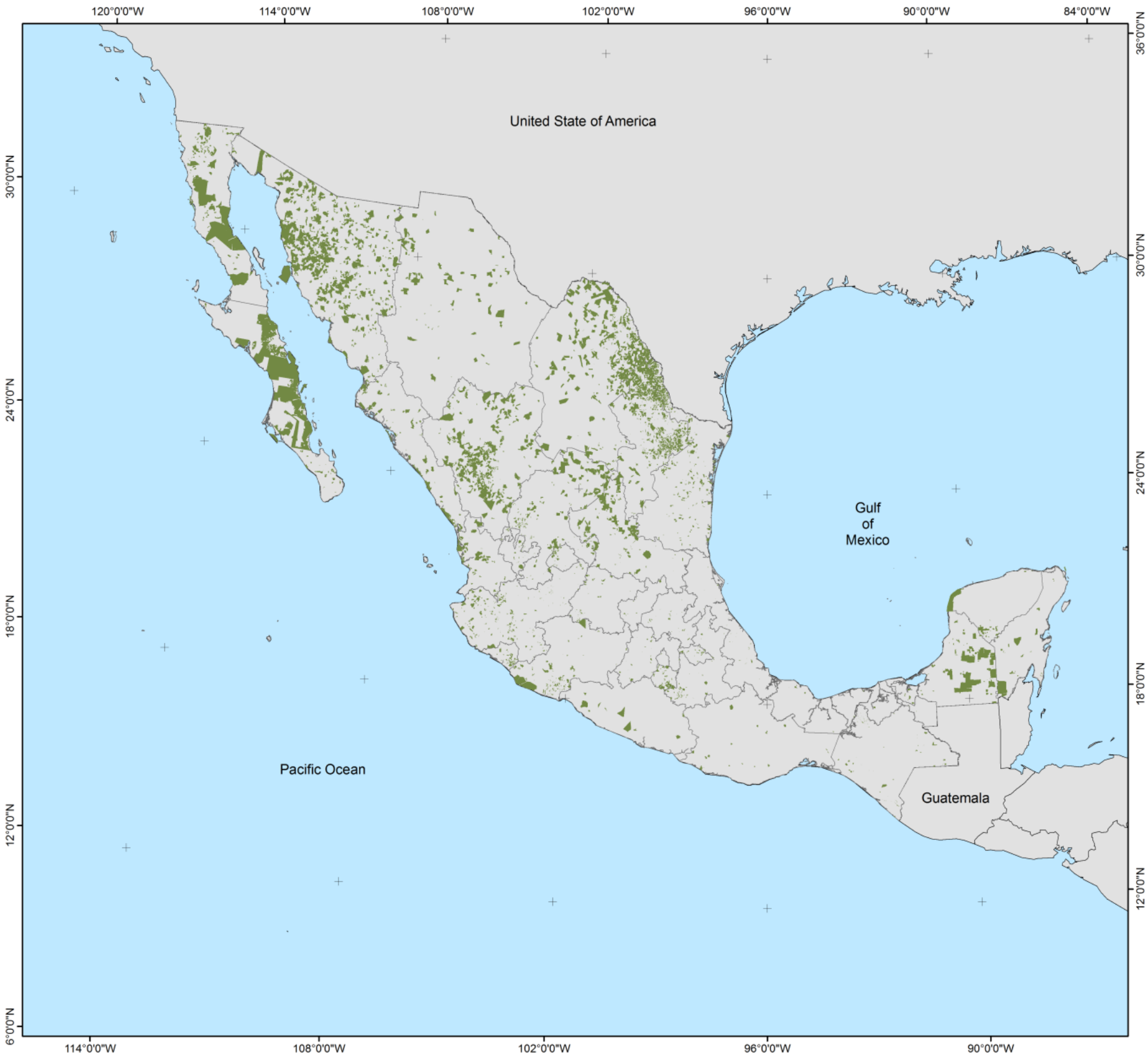
CONANP (Comisión Nacional de Áreas Naturales Protegidas) 2019. Áreas Naturales Protegidas. Ciudad de México, México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Management Unit for Sustainable Use of Wildlife (U M A)



LEGEND

- Management Unit for Sustainable Use of Wildlife
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: SEMARNAT, (15/03/2015). 'Unidades de Manejo para el Aprovechamiento Sustentable de la Vida Silvestre 2014', escala: 1:0. edición: 1a. Secretaría de Medio Ambiente y Recursos Naturales. Michoacán de Ocampo Morelia

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

RAMSAR Sites 2016 (Wetlands of international importance)

LEGEND

- RAMSAR Sites
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

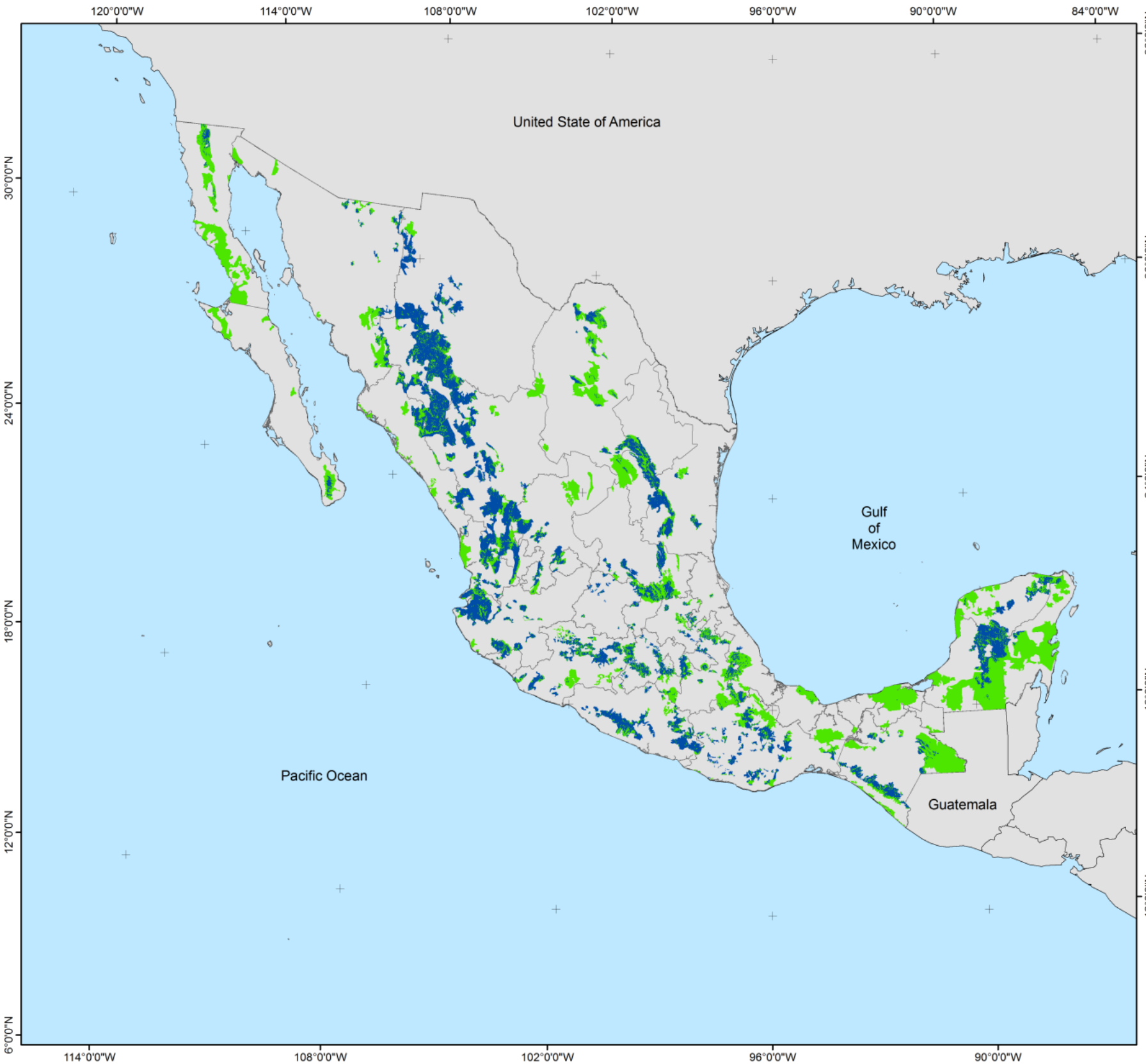
Source: Conanp. 2019. Sitios RAMSAR de México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Hidrological and biodiversity services



LEGEND

Environmental services

- biodiversity conservation
- hidrological services
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: CONABIO, (2014). 'Áreas elegibles para la conservación en México, 2014', escala: 1:250000. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. México, D. F.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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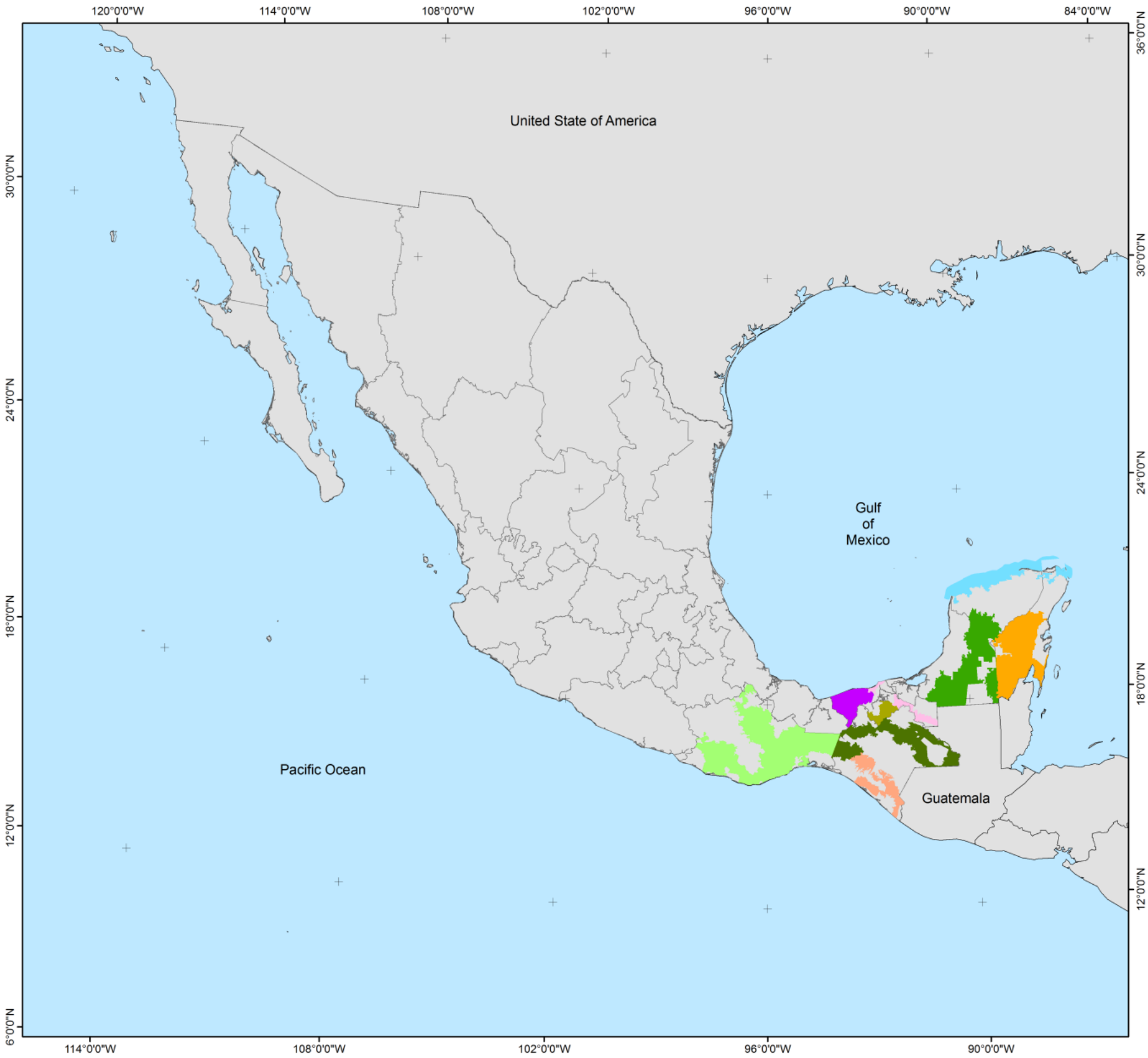
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Biological Corridors of Southeast Mexico



LEGEND

Biological Corridors

- Calakmul – Bala'an K'aax
- Costa de Yucatán
- Humedales Costeros – Sierra de Huimanguillo
- Oaxaca
- Pantanos de Centla – Cañón de Usumacinta
- Selva Maya Zoque
- Sian Ka'an – Bala'an K'aax
- Sierra Madre del Sur
- Sierra de Tabasco
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: CONABIO, (17/09/2018). 'División política municipal de los corredores biológicos del sureste de México', escala: 1:250000. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. División política Municipal de los corredores biológicos del sureste de México. México, Distrito Federal, Tlalpan.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Biogeographical Provinces

LEGEND

PROVINCES

- Altiplano Norte (Chihuahuense)
- Altiplano Sur (Zacatecano-Potosino
- Baja California
- California
- Costa del Pacifico
- Del Cabo
- Depresion del Balsas
- Eje Volcanico
- Golfo de Mexico
- Los Altos de Chiapas
- Oaxaca
- Peten
- Sierra Madre Occidental
- Sierra Madre Oriental
- Sierra Madre del Sur
- Soconusco
- Sonorense
- Tamaulipeca
- Yucatan
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO), (1997). 'Provincias biogeográficas De México'. Escala 1:4 000 000. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D. F.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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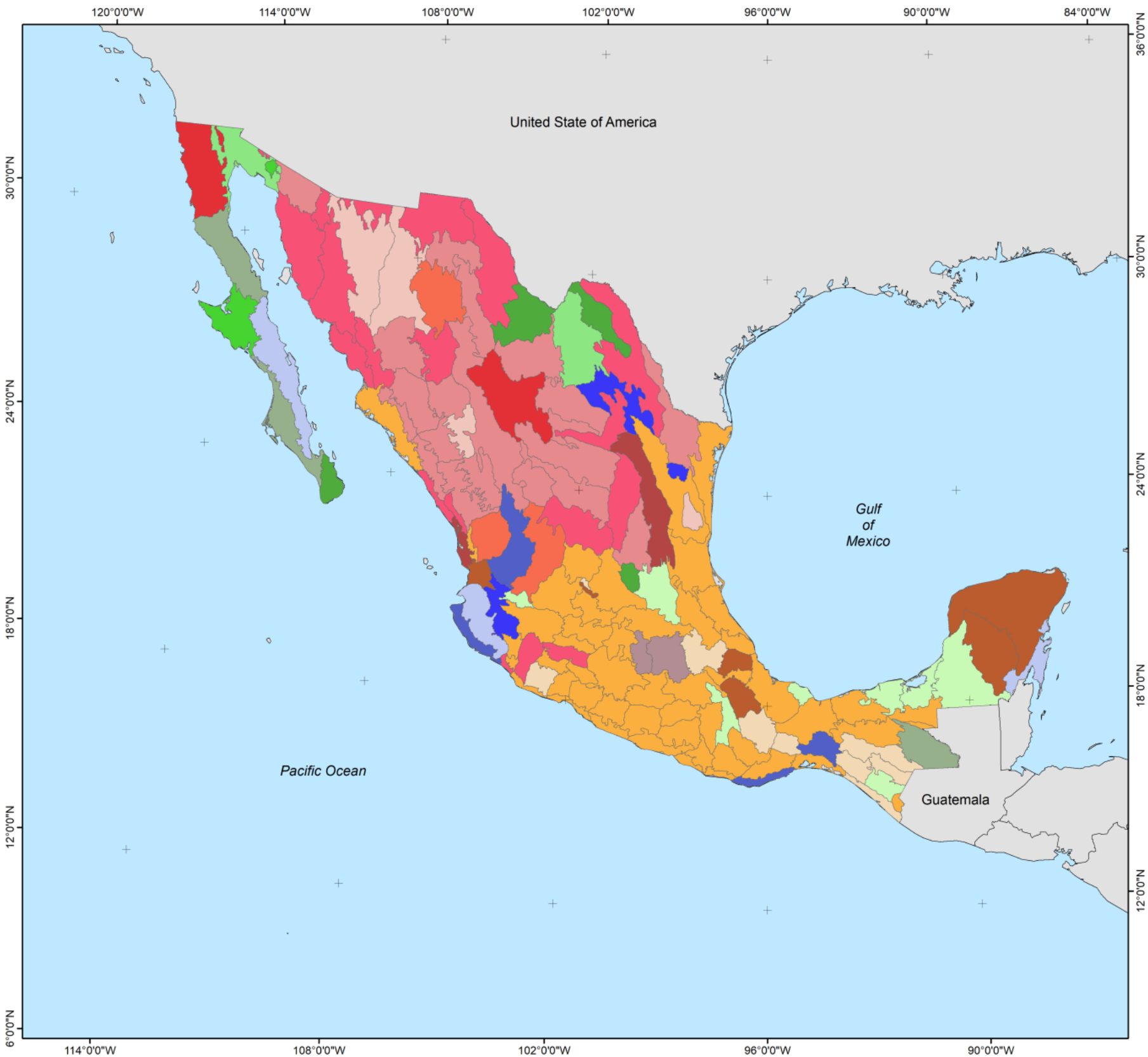
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

General Ecological Planning of the Territory 2012



LEGEND

Environmental Policy

- Preservation
- Preservation and Protection
- Preservation, Protection and Use
- Preservation and Sustainable Use
- Preservation, Sustainable Use and Restoration
- Sustainable Use
- Sustainable Use and Preservation
- Protection, Sustainable Use and Restoration
- Sustainable Use
- Sustainable Use and Preservation
- Sustainable Use, Preservation and Restoration
- Sustainable Use, Protection and Restoration
- Sustainable and Protection
- Sustainable Use and Restoration
- Sustainable Use, Protection, Restoration and Preservation
- Restauration, Preservation and Sustainable Use
- Restauration, Protection and Sustainable Use
- Restauration and Sustainable Use
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: SEMARNAT 2012. Programa de Ordenamiento Ecologico General del Territorio. Secretaría de Medio Ambiente Recursos Naturales. México, D.F.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
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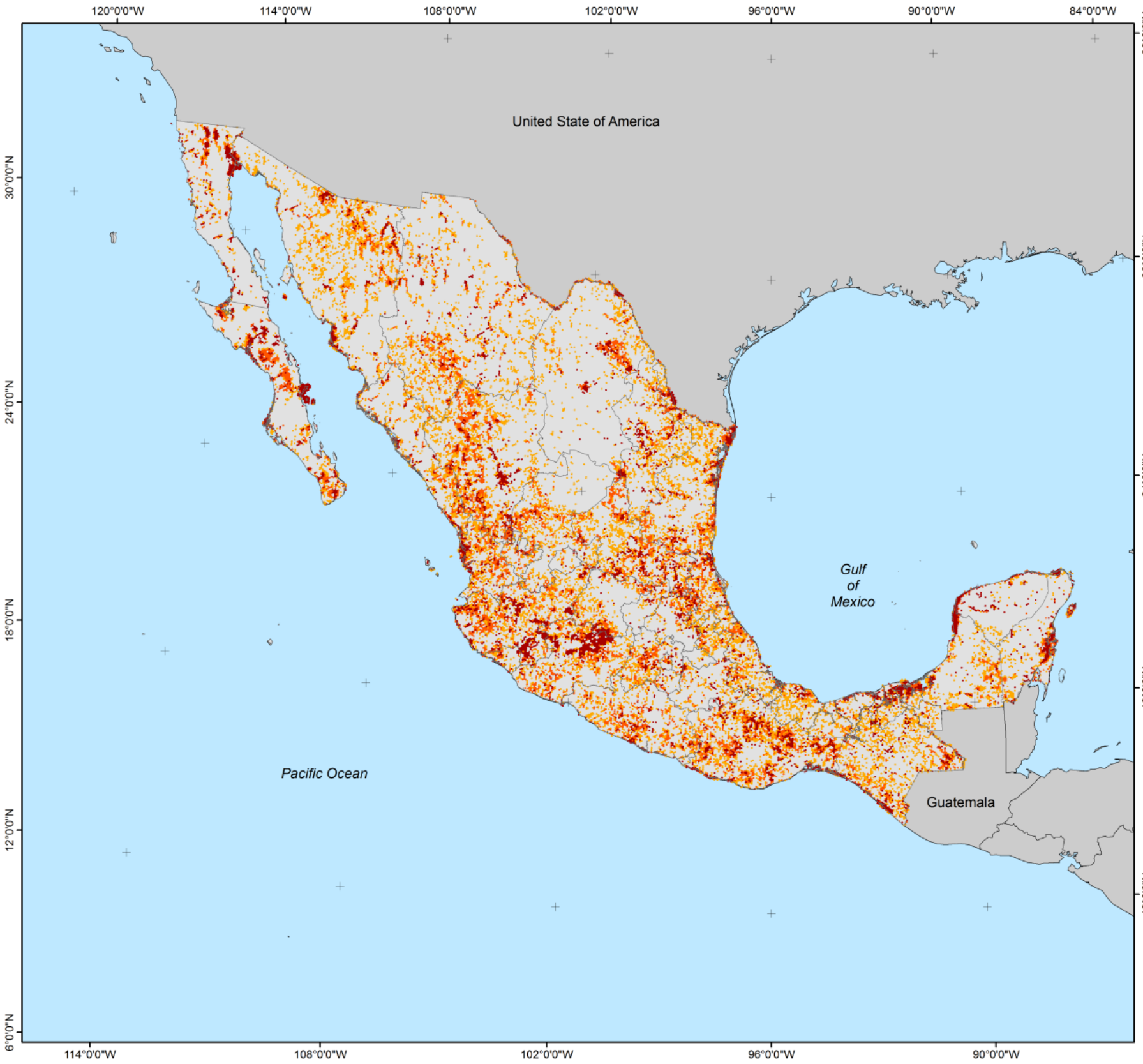
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Priority aquatic biodiversity continental conservation sites



LEGEND

PRIORITY

- Extreme
- High
- Medium
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Conabio-Conanp. 2010. Sitios prioritarios acuáticos epicontinentales para la conservación de la biodiversidad.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Physiographic Regions

LEGEND

- Regions
- State boundaries
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

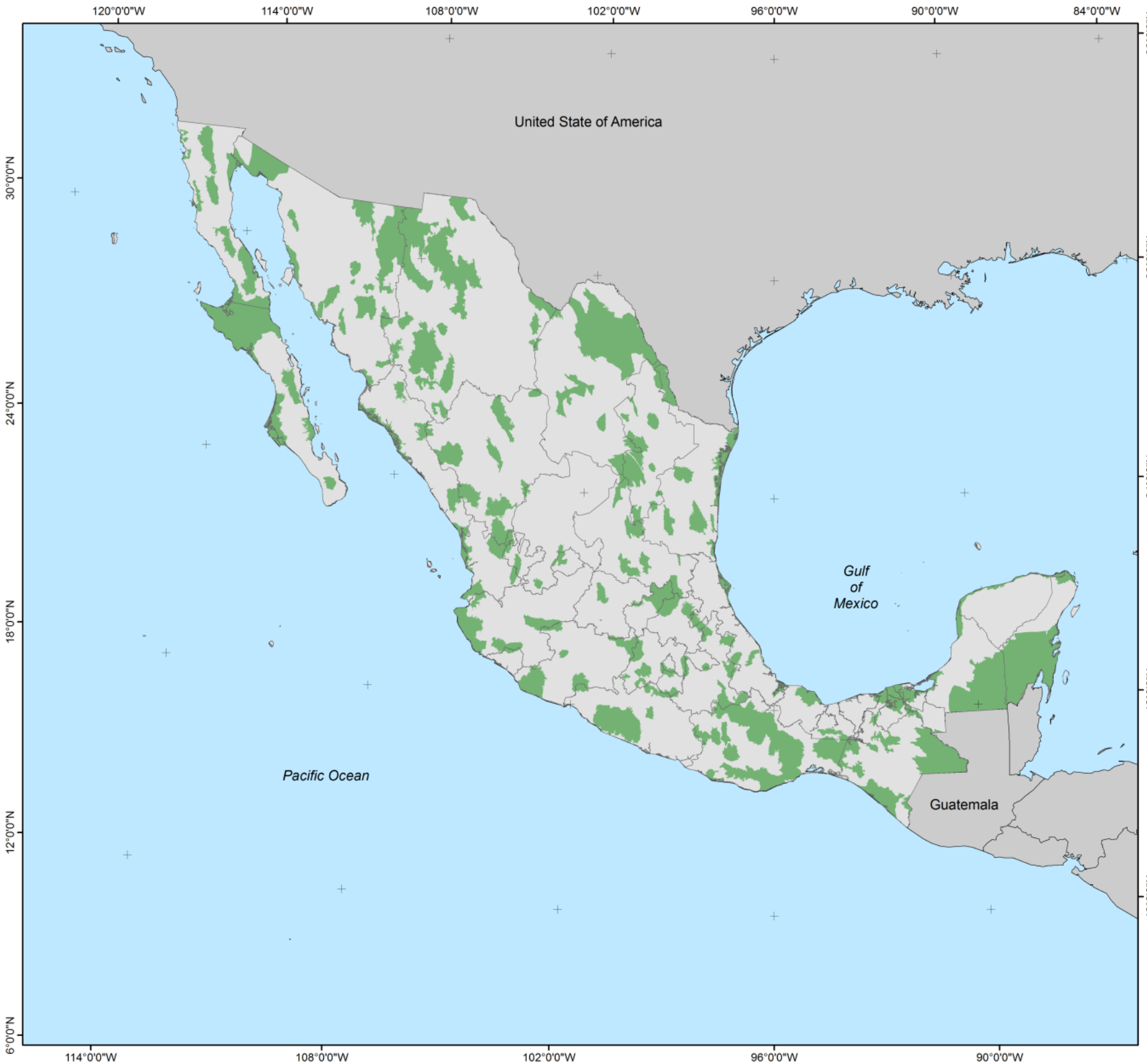
Cervantes-Zamora, Y., Cornejo-Olgín, S. L., Lucero-Márquez, R., Espinoza-Rodríguez, J.M., Miranda-Viquez, E. y Pineda-Velázques, A, (1990). 'Provoncias Fisiográficas de México'. Extraído de Clasificación de Regiones Naturales de México II, IV. 10.2. Atlas Nacional de México. Vol. II. Escala 1:4000000. Instituto de Geografía, UNAM. México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Priority regions for land conservation



LEGEND

- Priority regions for land conservation
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

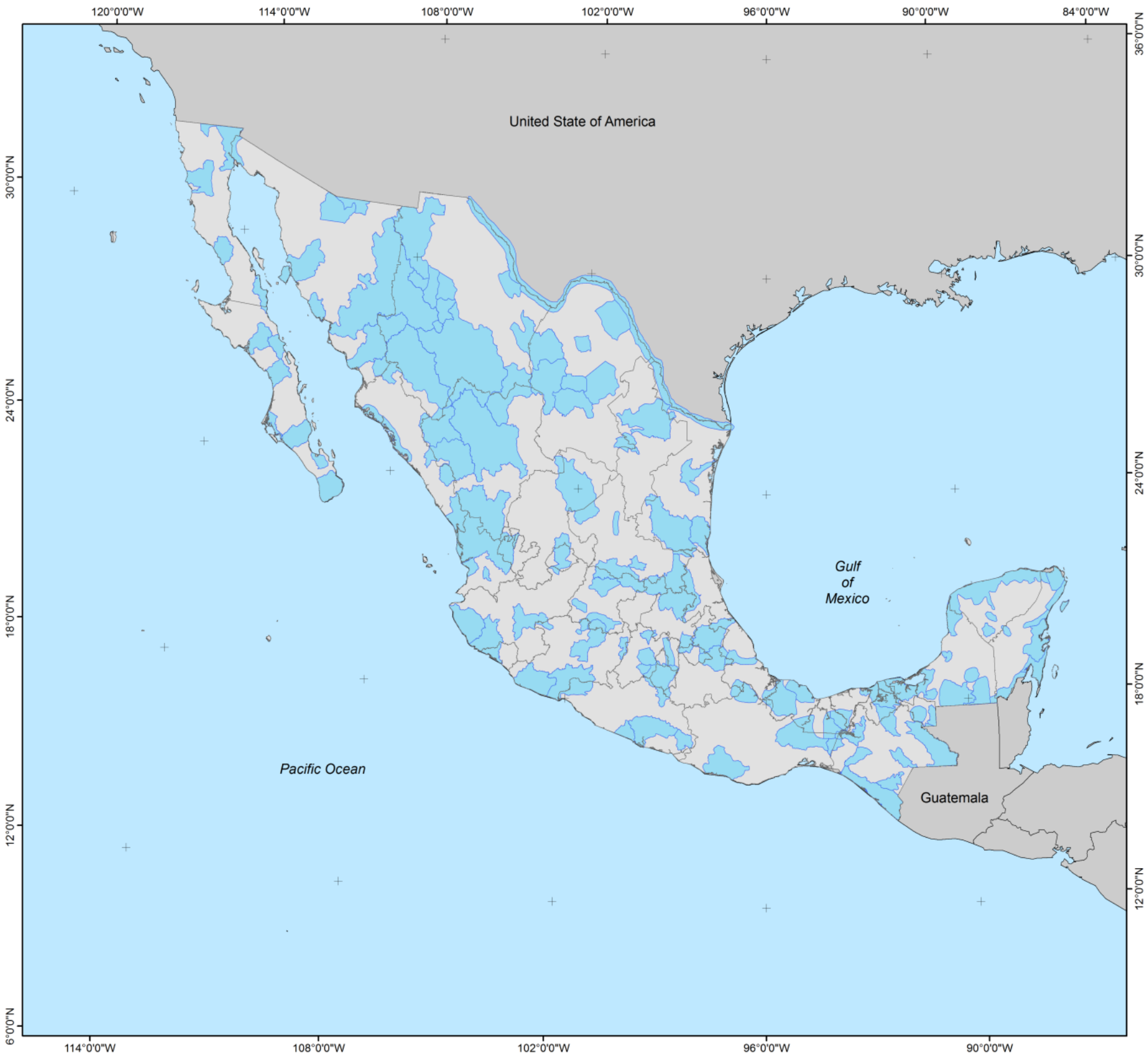
Source: Conabio. 2004. Regiones Terrestres Prioritarias.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Priority regions due to hydrological importance



LEGEND

- Priority regions due to hydrological importance
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Arriaga, L., V. Aguilar y J. Alcocer. 2002. Regiones Hidrológicas Prioritarias. Aguas Continentales y diversidad biológica de México. Conabio.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Priority Marine Regions

LEGEND

- Priority Marine Regions
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Conabio. 1998. Regiones Marinas Prioritarias de México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic
Projection: Albers
False_Easting: 0.00000000
False_Northing: 0.00000000
Central_Meridian: -96.00000000
Standard_Parallel_1: 20.00000000
Standard_Parallel_2: 60.00000000
Latitude_Of_Origin: 40.00000000
Linear Unit: Meter

Priority Marine Sites

LEGEND

- Priority Marine Sites
- State border
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

Source: Conabio, Conanp, TNC y Pronatura. 2007. Sitios prioritarios marinos para la conservación de la biodiversidad.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Regions

LEGEND

REGION

- North
- Center
- Southeast
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

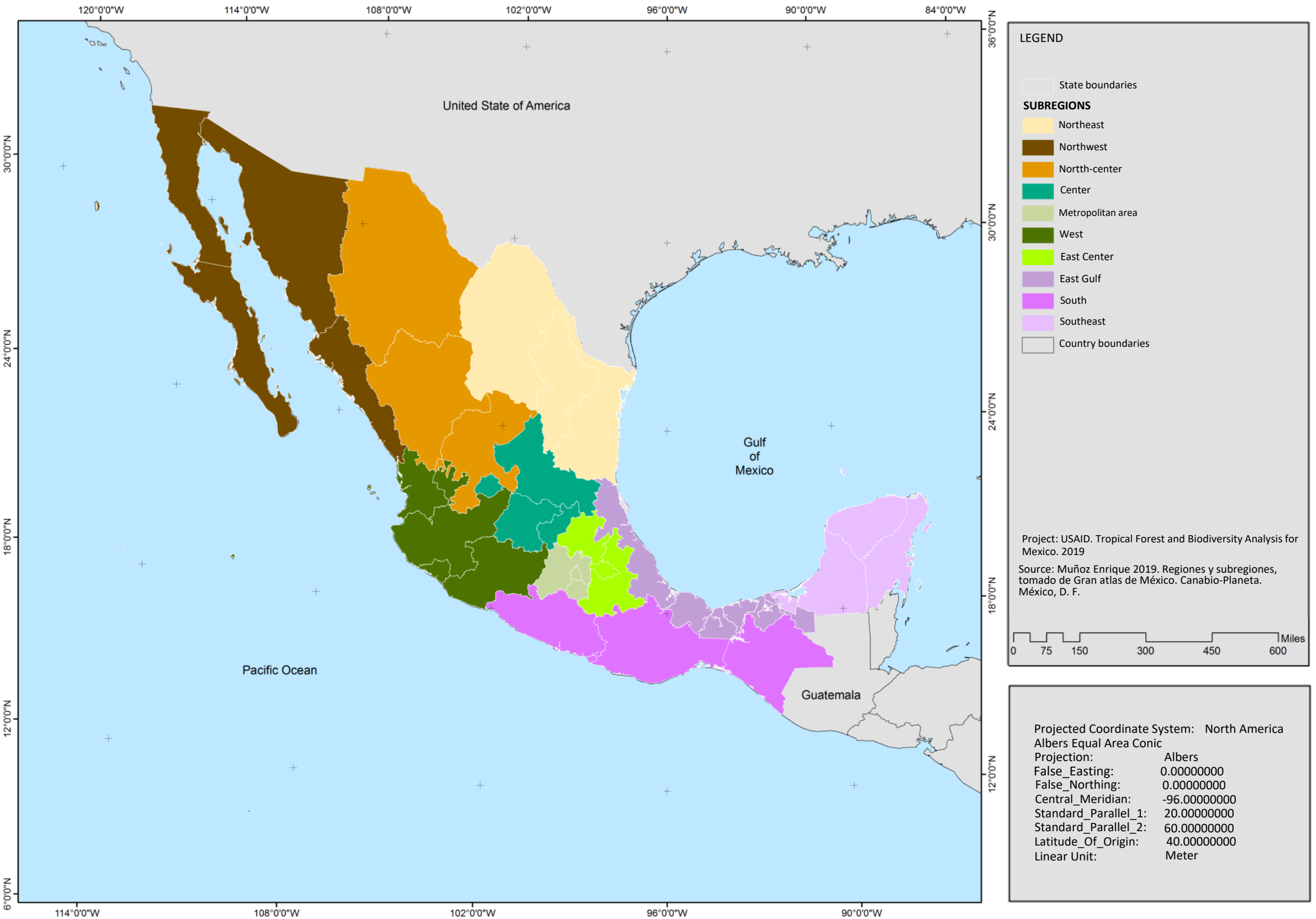
Source: Enrique Muñoz López 2019. Regiones de México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Geographical reference to integrate the analyzes



State Division 2018

LEGEND

State boundaries

Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

INEGI 2018. Áreas Geoestadísticas Estatales 1:250000 2018, escala: 1:250000. Edición: 1. Instituto Nacional de Estadística y Geografía. Aguascalientes, México.

Miles

0 75 150 300 450 600

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Municipal Division 2018

LEGEND

Municipal boundaries

Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

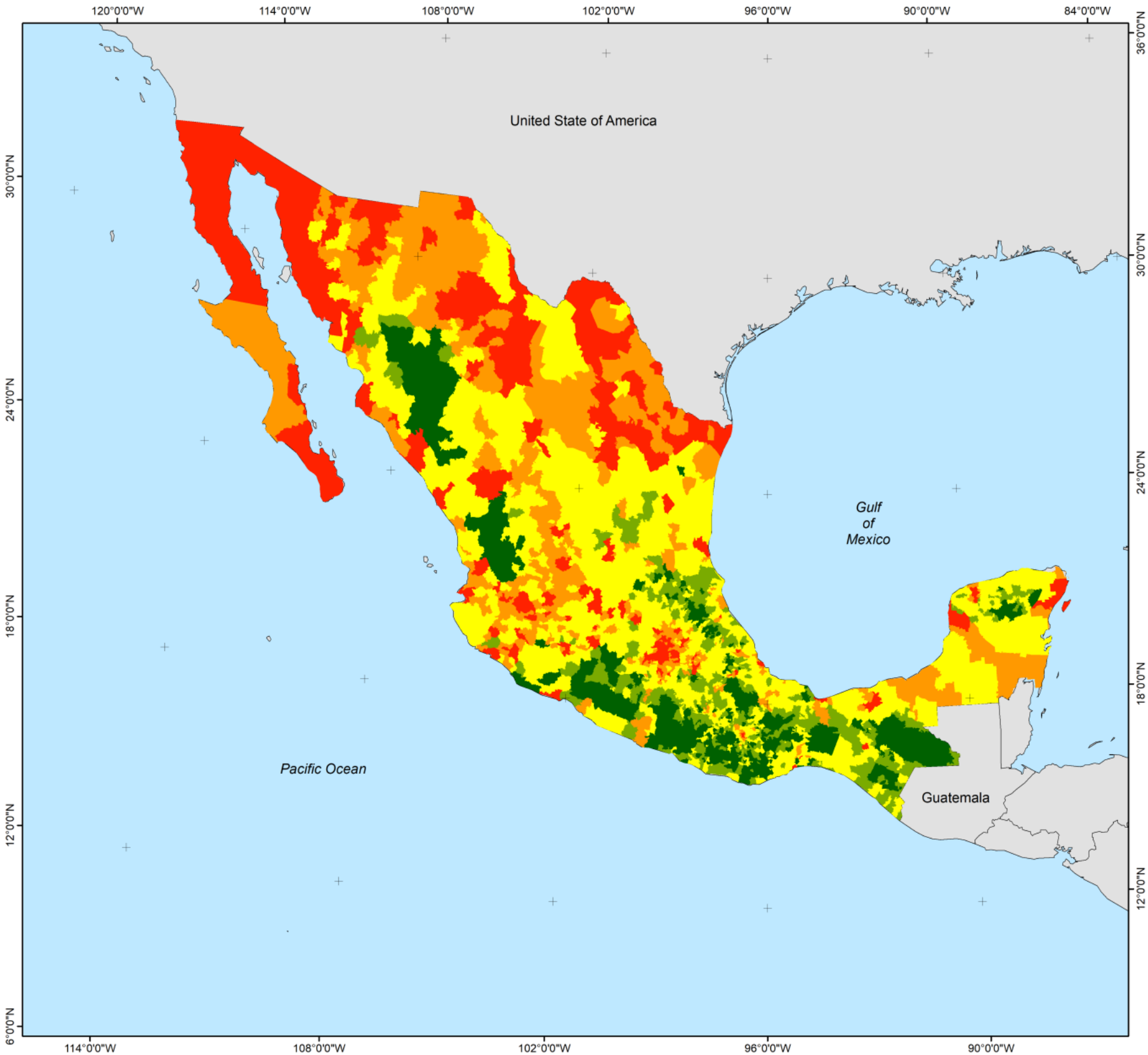
INEGI 2018. Áreas Geoestadísticas Municipales, Junio 2018, escala: 1:250000. edición: 1. Instituto Nacional de Estadística y Geografía. Aguascalientes, México.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
False_Easting:	0.00000000
False_Northing:	0.00000000
Central_Meridian:	-96.00000000
Standard_Parallel_1:	20.00000000
Standard_Parallel_2:	60.00000000
Latitude_Of_Origin:	40.00000000
Linear Unit:	Meter

Marginalization by municipality 2010



LEGEND

Grade of marginalization

- Very high
- High
- Medium
- Low
- Very low
- Country boundaries

Project: USAID. Tropical Forest and Biodiversity Analysis for Mexico. 2019

CONABIO 2010. 'Grados de marginación municipal, 2010', escala: 1:250000. México, D.F.

0 75 150 300 450 600 Miles

Projected Coordinate System: North America Albers Equal Area Conic

Projection:	Albers
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