LEVERAGING NATIONAL CONSERVATION ACTION THROUGH ECOREGIONAL PLANNING IN MEXICO

The Nature Conservancy, April, 2004

Document prepared by:
Juan Bezaury, Anne Gondor, Fernando Secaira, Ryan Smith, Cristina Lasch.
Comments incorporated from Raquel Leyva.

1 INTRODUCTION AND JUSTIFICATION

Multiple conservation priority setting exercises have been developed for Mexico over the last decades (Bezaury Creel *et al.* 2000), one the top world's megadiverse country. International, national and regional conservation organizations plan to continue, or are currently developing conservation portfolios, most of them based on expert consultation processes. In addition, international commitments adopted by the Government of Mexico (World Summit on Sustainable Development, Convention on Biological Diversity) requires the implementation of national terrestrial and marine protected area systems to protect the country's unique biodiversity, starting with a GAP analysis of the existing Protected Areas System and the ideal vision for the country. This requires a solid analysis to identify the areas that need to be conserved at national level in further details than previous exercises.. The Mexican institution that are likely to be in charge or involved in the GAP Analysis are SEMARNAT, CONANP, CONABIO and INE.

During February, 2004 over 180 of the world's governments gathered at the COP-7 meeting of the Biodiversity Convention in Kuala Lumpur, Malaysia to finalize a negotiated *Global Programme of Action on Protected Areas*. As a result of this meeting, a memorandum of understanding was adopted to build a Cooperative Partnership on Protected Areas, composed by the Ministry of Environment (SEMARNAP), the National Protected Areas Commission (CONANP) and major international NGOs such as CI, WWF and TNC. The purpose is to provide focused, strategic and coordinated support around key elements of the *Global Programme of Action*.

The Nature Conservancy and its partners are currently conducting an important number of ecoregional assessments (ERAs) in different parts of Mexico. TNC´s ecoregional planning standards, derived from Conservation by Design principles, provide scientific base for establishing such portfolios and allowing for transparency, consistency and comprehensiveness. TNC is committed to develop full portfolios for the entire country—the conservation blueprint--, therefores sees this opportunity to collaborate with the Government of Mexico, to develop the national portfolio, using the already identified portfolios and defining jointly the methodology to assess the rest of the country.

The Nature Conservancy approached the aforementioned Mexican Federal institutions (SEMARNAT, CONABIO, CONANP and INE) and all agreed to conduct one single GAP Assessment of the Protected Areas System in a collaborative manner.

2 INSTITUTIONAL ALLIANCES TO CONDUCT ERA

There will be several layers and mechanisms of coordination and organization:

1. SEMARNAT AND CONANP will lead the process and other Federal and civil sector institutions may facilitate it in close coordination
2. Formal agreements among Mexican Federal Government institutions in charge of leading conservation efforts in the country: SEMARNAT, CONANP, CONABIO and INE, with leading NGOs, such as TNC, WWF, CI and Pronatura. Other stakeholders could be Fondo Mexicano para la Conservación.
3. Alliances with different federal institutions who have nation-wide information: INEGI, UNAM (Instituto de Geografía, Instituto de Ecología) and 27 State Universities, research centers, etc.
4. Formation of approapiate committee and teams, which could be:

Committee or Team	Functions/relation	Institutional Members	Profile
Leading Team	Lead the process, political and institutional mechanism to pursue the A nalysis, fundraise, lobby	SEMARNAT, CONABIO INE	Senior Managers

	other sectors and institutions, promote its implementation. Public relations.	CONANP WWF TNC	
Planning Team	Design the methodology, plan the activities,	SEMARNAT, CONABIO INE CONANP WWF TNC	Science and planning staff
Operations Team	Collecting information, conducting the analysis, run GIS analysis.	To be defined, but at least: CONABIO TNC	Staff hired to conduct assessment: coordinators, experts, GIS specialists
Alliances	Provide relevant information, expertise, key personnel. participation in portfolio design	UNAM, State Universities, Research Institutions, etc.	
Relevant stakeholders	Institutions to kept well informed	Energy, Tourism, Forestry, Water, Agriculture, Public Works, State Governments, This should be SEMARNAT and CONANP´s responsibility.	Leading institutions from key economic sector that relates to the environment, who may adopt the results.

Therefore, in order to complete Mexico's nation-wide assessment the potential role of each leading institution varies according to each institutional mandate and priorities. The relevant activitities to be conducted by each one are: TO BE FILLED BY EACH ORGANIZATION.

2.1 SEMARNAT

Present the process to other Federal o national level institutions
Represent the Government of Mexico to Biodiversity Convention?

2.2 CONANP

Propose the new sites as protected areas

2.3 CONABIO

1. Define distributions of species based on GARP analysis, given the present climatic conditions and under new variables due to climate change. Selected species of birds. CONABIO is working collaboratively with UNAM (Victor Sanchez) and University of Texas (xxx)
2. Biotica and records of species:

2.4 INE

2.5 WWF

2.6 TNC:

The TNC approach to the GAP analysis is explained in detail in Annex 1.

1. Conduct ERAs where TNC and partners have not done them yet, in one single process.

2. Integrate results with finished ERAs into a nation-wide assessment that can provide necessary information for Mexico's COP-7 commitments in relation to the definition of a representative protected area system for Mexico. The ecoregional methodology designs a portfolio of conservation sites, which compared with the existing protected area system of Mexico allows to identify conservation gaps in the system, thereby fulfilling COP-7 commitments.
3. Propose the integration of conservation areas either into the Protected Area Systems or into other environmental policy structures that will allow for their protection.

3 ANNEX 1: ECOREGIONAL PLANNING.

3.1 PLANNING UNIT: AGREGGATIONS OF ECOREGIONS

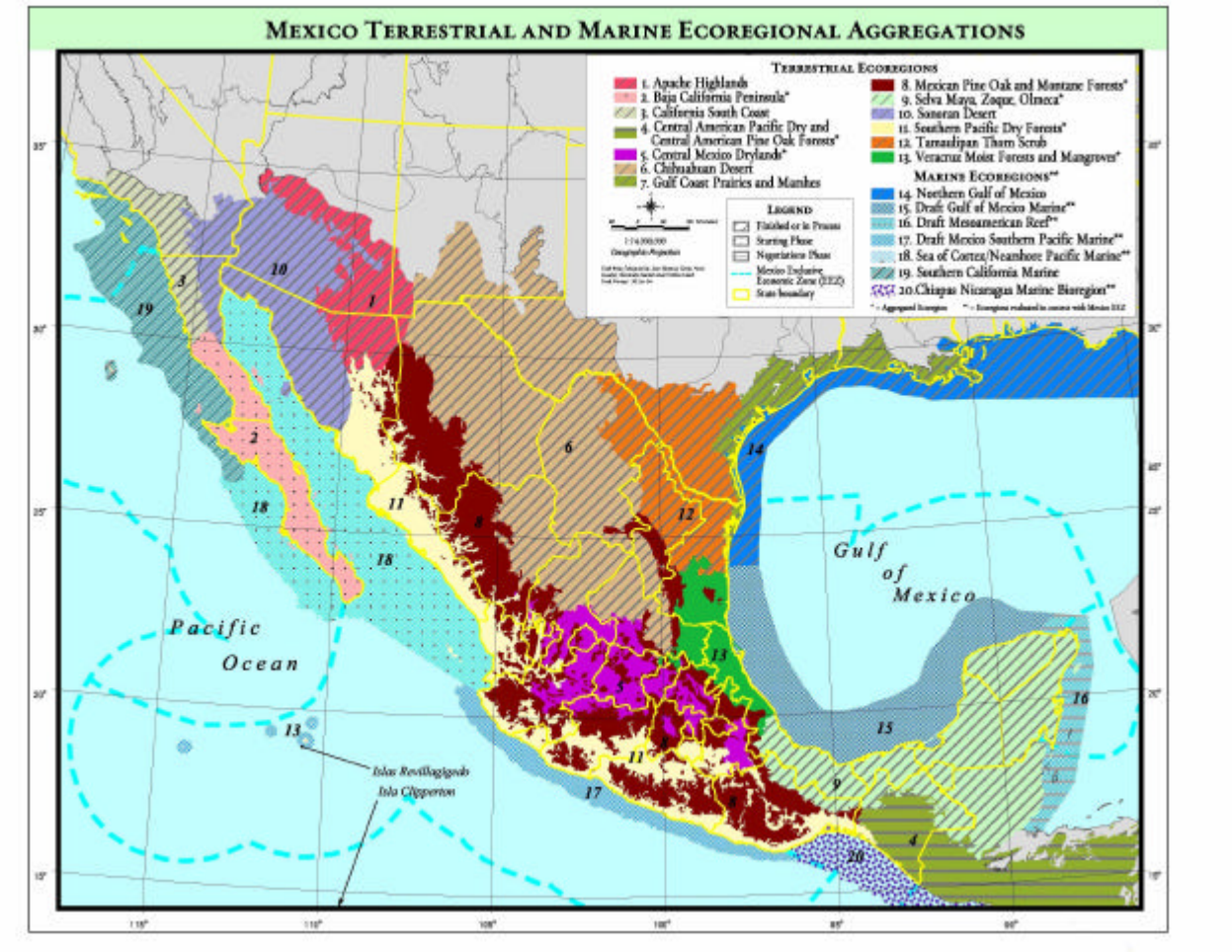
Previous ecoregional planning efforts in Mexico have shown several advantages of grouping ecoregions, rather than conducting individual ecoregional plans. The process outlined in this document pretends to assess ecoregions where ERAs have not been completed or are currently being conducted, in a set of aggregations. This planning process will group all remaining terrestrial ecoregions in 5 different terrestrial planning units (grouped by biomes or major habitat type). Each planning unit will have its own lead, a team of experts, and a distinct GIS analysis. The ecoregions forming each planning unit will constitute at least the stratification units, therefore the analysis can be done and the information can be presented by ecoregion, complying with TNC standards. The freshwater biodiversity will be assessed through Ecological Drainage Units (EDUs). In the case of marine diversity, this process intends to focus on nearshore systems only.

Note: WWF ecoregions (Dinerstein et al. 1995) were defined at a coarser scale than the required for this planning exercise (1:250,000) and the experience of previous assessments shows that the limits will require serious adjustments. One of the first steps of the process will propose these new limits which will be documents and supported adequately and presented to the CPG as indicated in the standars.

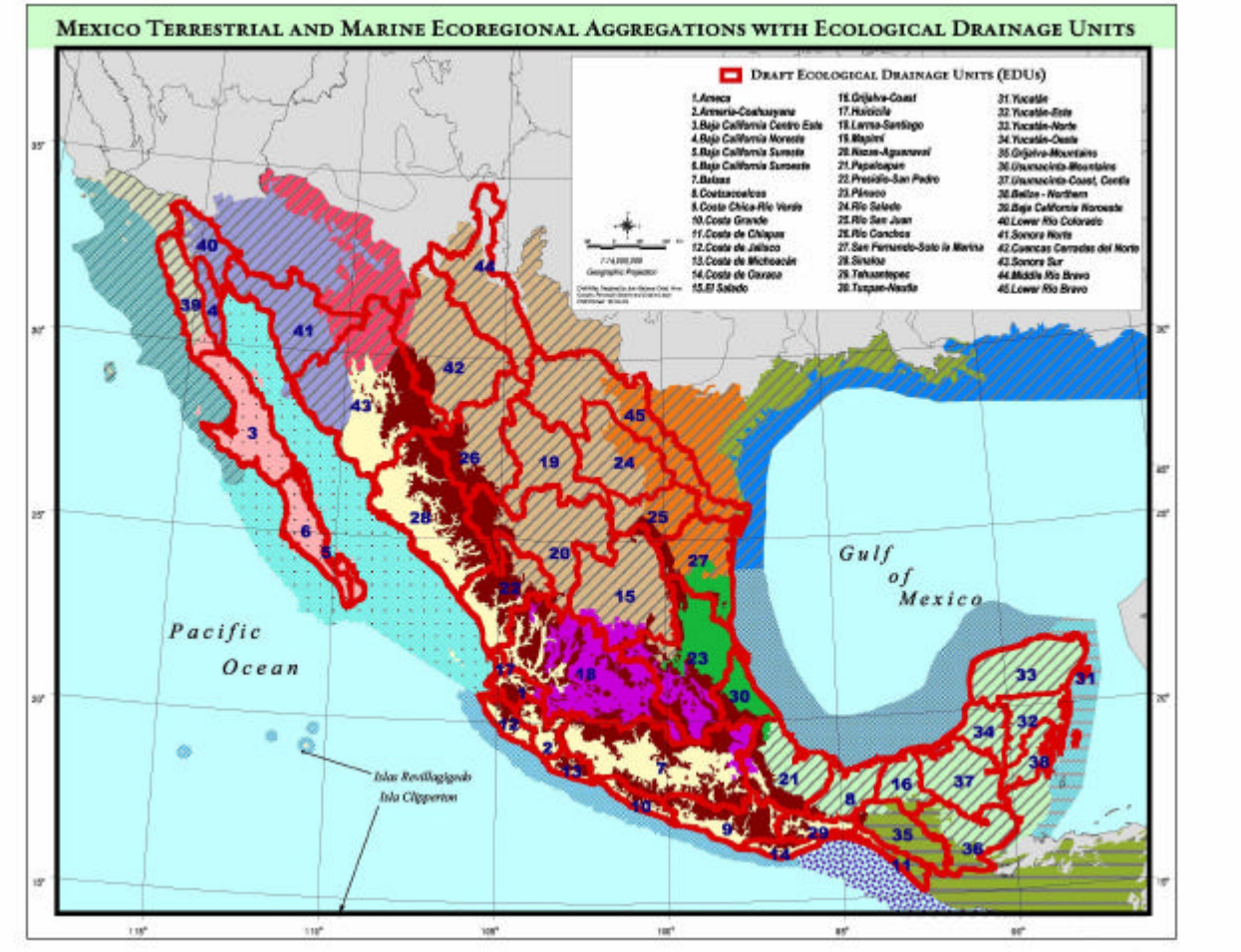
The ecoregions present in Mexico, currently without ERAs are representations of the following biomes:

1. Tropical Moist Forests
2. Tropical Dry Forests
3. Montane Forests (pine-oak, montane)
4. Deserts
5. Freshwater
6. Marine and Coastal

Map 1: Mexico Terrestrial and Marine Ecoregional Aggregations in Appendix A. Terrestrial aggregations in the map are based on a revised version of WWF ecoregions (Dinerstein et al. 1995). In the case of marine ecoregional aggregations the draft boundaries were derived from an averaged continental shelf depth (3000 meters) and the Mexican Marine Bioregions developed by WWF included in the Conservation of Biodiversity in Mexico document (Bezaury Creel *et al.* 2000). Dashed lines show the Mexican Exclusive Economic Zones, which could be the analysis area if pelagic and deep sea diversity is to be considered in the assessment.



Map 2: Mexico Terrestrial and Marine Ecoregional Aggregations with Draft Ecological Drainage Units in Appendix B. This map represents a rough draft of EDUs for Mexico. When EDUs have been drafted for all of Mexico, they will be assigned to each terrestrial ecoregional assessment unit and planning work for those EDUs will go along with that assessment unit. The delineation of EDUs in Mexico will take into account six main pieces of information: 1. CNA regions, 2. WWF freshwater ecoregions, 3. information on species composition and richness within watersheds, 4. other coarse drainage patterns and/or drainage breaks, 5. dominant geomorphic patterns, 6. any relevant climatic or geologic patterns. The current draft represents a complete assessment of pieces 1 and 2 and a partial analysis of pieces 4 and 5, but has not yet included 3 and 6. A plan is being devised to finish development of these EDUs in cooperation with WWF, who is undertaking a revision of freshwater ecoregions in MX. See Appendix A.



3.2 INTERNAL ORGANIZATION

3.2.1 Operations Teams:

Permanent staff that will be required to conduct the process

1. General Coordinator: institutional liaisons, project management, etc.
2. Science Lead
3. Six Biome-major habitat leaders
4. Information manager (database expert, not conducting GIS analysis)
5. Administrative Assistant

3.2.2 Experts

Formation of six teams grouped by biome or major habitat type. Each team would be formed by 10 recognized experts in flora (3), fauna (3) and ecology (3) and one leader, all of them from different leading institutions

1. Tropical Moist Forests
2. Tropical Dry Forests
3. Montane Forests (pine-oak, montane)
4. Marine and Coastal
5. Freshwater
6. Desert
7. Socio economic issues and strategies

3.2.3 GIS Contractor

The analysis may be conducted by teams or experts with expertise and experience doing ERAs. This would be more effective than training new experts in tools and methods that will rarely be used again. The analysis implies GIS work, analysis advised by geology, soil, weather and vegetation experts. This work will likely be carried out by a contractor Operations team

3.3 PROCESS

The process should be designed by the Planning Team and approved by the Leading Team. The design process will take place during the next two months. The process presented here is The Nature Conservancy approach, as an illustrative example only.

3.3.1 Collect and use the best available data and information

This effort will gather data based on CONABIO´s, CONAFOR´s, INEGI´s and National and State Universities and Reaserch Centres This approach will minimize data disparity by using national datasets and creating formal agreements with the Mexican institutions responsible for developing and disseminating the data normally used for such assessments Collecting information efforts are currently conducted by CONABIO on a regular basis. Even cartographic State-level information is generally provided by INEGI. *More detailed information available from States (such as Yucatan´s vegetation map or a Biosphere Reserve Ecosystems Map) can be used only as references to clarify doubts in some locations, but they cannot be incorporated fully into the process, because that would generate a disparity along the planning unit*. As noted above, expert teams will be established for filling data gaps in our knowledge of the ecoregions. Data used and developed will be well documented with data dictionaries, complete with an analysis of confidence levels.

3.3.2 Prepare Databases

A. Consistent Data Management and Reporting

We will need and use two types of information:

1. Databases of records of species. This information is compiled and owned by CONABIO.
2. Cartographic information (GIS Databases): geology, topography, vegetation, climate, soils, etc.

This information generally presents serious gaps, limitations and will most likely need to be fixed to run the analysis. This may be conducted by INEGI There is some information that the GIS-Contractor will need to process. If required, TNC will manage data independtly, to comply with with TNC conservation data recommendations. This may include managing tabular data within a database such as the TNC Conservation Planing Tool (CPT), documenting all spatial data within metadata standards, tracking all reports and documents. All data (spatial and tabular) will be evaluated and assigned a reliability rating such as described by the TNC Conservation Measures Group.

B. Public Availability of Assessment Products

A formal publication will be produced and distributed. All digital data (tabular, spatial, report) will be produced on CD-ROMs. The potential for posting data and reports to a partner website (such as CONABIO or CONANP) will be evaluated.

3.3.3 Assess ecoregional limits

Ecoregional boundaries will be assessed and defined by ecologically meaningful units of analysis.
There is much to debate about this, but there are two options:

1. Generate a new proposal of ecoregional limits based on experts´ criteria, such as vegetation, climate, geology, etc.
2. Subdivide the proposed aggregations of ecoregions (large biomes-major habitat types) in subdivisions (stratification units), which may, in the future, be proposed as new ecoregional boundaries.

The proposed ecoregional boundaries (see map 1 in Appendix A) were based on WWF ecoregional boundaries (Dinerstein, 1995) and the most current TNC spatial file for completed ecoregions. Aggregations were based at the biome level. Freshwater ecoregions will be attributed to the surrounding habitat level aggregation, but are based on a compilation of freshwater prioritization exercises produced by Romero and Lasch 2002 and a draft Ecological Drainage Units map developed by Ryan Smith, 2004 (see map 2 in Appendix B). The initial draft of Marine ecoregions will consider the Marine Initiative advice for selecting boundaries of continental shelf/slope or currents (Beck et al. 2003), ERAs such as the Southern California Marine and Northern Gulf of Mexico, biogeographic regions established by WWF and the Mexican Exclusive Economic Zones (EEZ) further described in Bezaury Creel et al, 2000. This aggregated approach to the ecoregional assessment process will potentially facilitate roll ups and analysis associated with the 10 year Habitat Goal: “By 2015, The Nature Conservancy will work with others to ensure the effective conservation of places that represent at least 10%* of every major habitat type on Earth.”

3.3.4 Portfolio or Conservation Areas Network Design

The Operations team will follow the TNC method (Geography of Hope, Groves et al 2000) along with its partners.

1. **Conservation targets represent the full array of biodiversity**
   Using the coarse/fine filter approach the full array of terrestrial, freshwater and marine conservation targets will be represented at multiple scales. Gaps in target data will be determined and evaluated for potential strategies to fill those gaps through biome expert teams. These strategies can then be applied at a later date in future ecoregional revisions. Ecological systems will be derived from national level vegetation data sets and cross-walked with finer resolution data sets when possible.
2. **Conservation Goals reflect quantity, quality and distribution**
   Numeric conservation goals for targets will be defined for each spatial stratification unit of the original ecoregions comprising the aggregations. These may be further refined where deemed necessary using topography, elevation and climatic data. A documented rationale will be developed to describe the target quantity, quality and distribution of each conservation target.
3. **Quality and Screening of Target Occurrences**
   Key ecological attributes will be defined for each target using the criteria of size, condition and landscape and natural ranges of variation contexts. The status of each attribute will be assessed for

each target and confidence levels will be defined. Assessing ecological integrity and the viability of targets will be the greatest challenge in this assessment. A surrogate analysis will be developed such as a suitability index to hypothesize measures of environmental condition on the landscape. This index will consider such parameters as level of fragmentation, road density, agricultural, industrial and urban development.

4. **Efficient and Effective Conservation Area network design**
   The first iteration will be designed to most effectively meet goals set for conservation targets, using the principles of representation, functionality, irreplaceability, and efficiency, using a site selection algorithm such as SPOT. This first iteration portfolio will help direct efforts towards the COP-7 goals and towards the Conservancy's 10% Habitat goal. The analysis will be run nationally including ecoregions previously completed, and then compared against previous assessment portfolios to determine differences. ¡

3.3.5 Integration of Mexico-wide information.

The portfolios and information generated by different ecoregional assessment throughout the country will be assembled into one single portfolio for the entire country, including the ecoregions bordering with other countries. This roll up of information will allow us to have a clear picture of the country, the complete portfolio of conservation areas, the aggregated list of targets and the databases of the information used and generated. Some additional maps may be assembled.

3.3.6 Protected Areas GAP Análisis

One of the byproducts of this ecoregional assessment process will be the Protected Area Gap Analysis that the Government of México has committed to develop by 2006 through the Program of Work adopted in the COP7 of the Convention for Biological Diversity. The process here described will provide the greater conservation portfolio using the precise targets and goals required to obtain the desired representativity, that will be compared against the current systems of protected areas, . The universe comprised by the portfolios identified by the ecoregional assessments, a subset of sites with potential to be nominated as protected areas to complete the Mexican Federal System of protected areas will be selected. The remaining areas will be covered by other conservation mechanisms or strategies. Results from previous gap analyses (such as CONABIO priority setting exercises and Cantu 2002) will also be evaluated and compared in this phase.

Since the General Agreement derived from the COP-7 CBD process is signed not only with the protected area authority CONANP, but with SEMARNAP, it provides an unique opportunity to incorporate sites identified by the portfolios, not considered for inclusion within the National Protected Area System, to be incorporated as "critical areas for ecosystem and biodiversity conservation" (*áreas críticas para la conservación de los ecosistemas y la biodiversidad*) as established in the Environmental Zonning Regulations (*Reglamento de la LGEEPA en Materia de Ordenamiento Ecológico*), within each Environmental Zoning Program. This negotiation would be greatly facilitated by having the National Institute of Ecology (INE) participating in all of our ecoregional planning efforts.

3.3.7 Contextual analysis:

Different analyses will provide the framework to assess where to work and what to do at different levels: nation-wide, ecoregion or aggregated-ecoregions wide, or at a site level. These analyses include, but are not limited to: Threats, opportunities and stakeholder analysis, considering both present and future trends. It will be necessary to build scenarios to predict future major changes and developments.

Opportunities assessments

The purpose of Conservation Areas is to maintain biodiversity and improve-maintain human welfare. Therefore it is important to identify the main opportunities which increase the potential to conserve, to address threats, as well as those which obtain benefits from biodiversity.

Threat Assessments

Mexico Ecoregional Assessment Approach

The COP-7 agreement (Activity 1.5) requires an assessment of key threats to protected areas with strategies to prevent or mitigate those threats. This ERA will provide a threat assessment at several levels. Threats to the proposed conservation area network in relation to targets affected and threat patterns across the ecoregions to assess the dynamics of threat change. Each threat will be evaluated as to severity and scope and reflect the standardized guidelines established by TNC. Examples of potential threats that may be analyzed will be human population growth and socioeconomics, altered fire regimes, altered hydrologic function, climate change and over-fishing.

3.3.8 Selecting action sites

Conservation areas will be selected based on their relative ecological importance vis-à-vis other sites, the degree to which they are threatened (urgency of action), their conservation feasibility (opportunities of success) and their potential to affect other sites or actions (leverage).

A. To measure the importance of a site, certain criteria must be employed such as: irreplaceability (based on the conservation targets it may contain), complementarity (its contribution to conserving existing targets in other areas), its uniqueness (no other similar area exists or it contains conservation targets found only there) and efficiency (the degree to which it contributes to conservation targets), marine examples may focus on connectivity (fish dispersal and oceanographic currents), and resilience.
B. To measure the urgency of action it will be necessary to undertake the above-mentioned analysis where threats are identified and provided with a score for each site.
C. To determine the likelihood of success, social and political context, institutional capacity and other opportunities will be assessed.

3.3.9 Conservation strategies

The planning team should decide upon suitable strategies with a wider group of stakeholders based on priority threats (pressures and sources of pressure), the most important opportunities, trends and scenarios and priority areas. The process is as follows:

A. Identify multiple strategies for each of these aspects
B. Integration of strategies (many may either be repetitive or complementary)
C. Analyze effectiveness, viability and the cost of each strategy
    - Effectiveness is measured by determining the contribution made to threat reduction and/or achieving conservation in priority areas.
    - Viability is determined by taking into account the social and political support for the initiative, the existing institutional capacity for its implementation and the likelihood of obtaining funds.
    - Its cost is estimated in a general way and determines the efficiency (greater performance from invested resources based on the ensuing conservation impact).

3.3.10 Ecoregional Measures Developed

It is necessary to track progress toward our goals set for each conservation target to recognize our conservation success. The COP-7 agreement (Activity 4.1.2) recommends developing a long-term monitoring system to measure biodiversity status, status of conservation targets, ecological integrity, threat abatement and effective management capacity. This ERA will establish appropriate indicators established by the TNC Conservation Measures Group to accomplish this activity. These may include progress towards meeting numeric goals for targets, changes in conservation management designation for target occurrences and the proposed conservation areas network, management effectiveness ratings for protected areas, threats assessment and changes to land cover status.

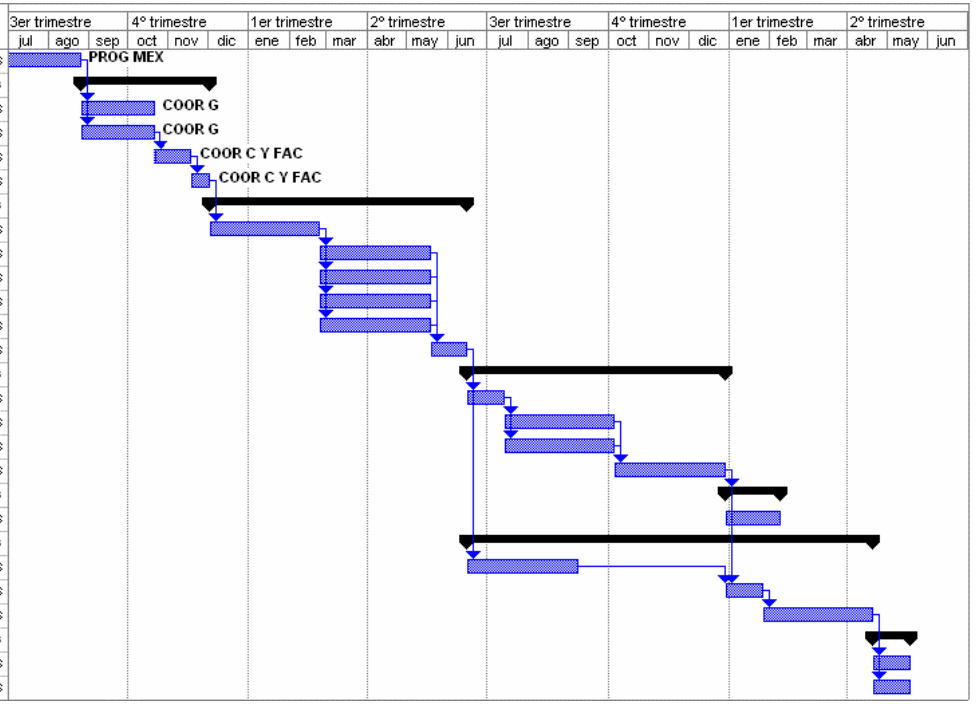
3.3.11 Peer Review Throughout Process

Participation in the TNC ecoregional peer review process is key to the success of this effort. We feel that this innovative approach can serve as a model for other countries with limited resources and funds to accomplish ecoregional assessments efficiently and in a timely manner, while maintaining scientific integrity.

3.4 ACTIVITY TIMELINE

Estimated time 24 months.
Hiring the operations team coordinator can take 2 to 3 months before starting the process.

Id	Task Name	Duración
1	FORMACION EQUIPO OPERATIVO (COORDINADOR Y ASISTENTE)	40 días
2	**ARRANQUE**	**70 días**
3	CONSTRUIR ALIANZAS Y FORMAR GRUPO DE COLABORADORES	40 días
4	COMPLETAR EQUIPO: LIDERES DE BIOMA Y CONTRATOS GIS	40 días
5	ESTABLECER EQUIPO POR BIOMA	20 días
6	CAPACITACION EQUIPOS DE BIOMA	10 días
7	**RECOLECTAR Y EVALUAR LA INFORMACIÓN**	**140 días**
8	COLECTA DE INFORMACION Y ARREGLOS INSTITUCIONALES	60 días
9	CONSOLIDAR INFORMACIÓN ECOLÓGICA CARTOGRÁFICA	60 días
10	CONSTRUIR LISTADOS DE ESPECIES	60 días
11	EVALUAR INFORMACIÓN SOCIOECO CARTOGRÁFICA Y ESTADÍSTICA	60 días
12	COLECTAR INFORMACIÓN INICIATIVAS Y PROCESOS RELEVANTES	60 días
13	CONSOLIDACION DE INFO Y MANEJO DE DATOS	20 días
14	**CONSTRUCCIÓN DE LA RED DE AREAS DE INTERES PARA CONSERVACION**	**140 días**
15	TALLERES DE DEFINICION DE ELEMENTOS DE CONSERVACION	20 días
16	REVISION Y DEFINICION ELECTRONICA DE METAS DE CONSERVACION	60 días
17	ANALISIS GIS DE OCURRENCIAS PARA DETERMINAR DISTRIB. ACTUAL	60 días
18	GENERAR PROPUESTAS USANDO SPOT Y BASADOS EN INFO TALLERES	60 días
19	**INTEGRACION DE INFORMACION CON OTROS PLANES ECOREGIONALES**	**30 días**
20	INTEGRACION DE GIS Y BASES DE DATOS	30 días
21	**PLAN DE TRABAJO**	**220 días**
22	ANALISIS DE OPORTUNIDADES, AMENAZAS Y ACTORES	60 días
23	ANALISIS DE SITIOS DE ACCION	20 días
24	DESARROLLO DE ESTRATEGIAS	60 días
25	**FINALIZACION DE DOCUMENTO E INTEGRACION DE INFORMACION**	**20 días**
26	EDICION DE DOCUMENTO ESCRITO	20 días
27	AFINACION DE BASES DE DATOS	20 días



3.5 References

Abell R., D. Olson, E. Dinerstein, P. Hurley, J. Diggs, W. Eichbaum, S. Waters, W. Wettengel, T. Allnutt, C. Loucks, P. Hedao, 2000, Freshwater Ecoregions of North America a Conservation Assesment, World Wildlife Fund - Island Press, Washington D.C., 321 pp.

Arriaga, L., J.M. Espinoza, C. Aguilar, E. Martínez, L. Gómez y E. Loa (coordinadores). 2000. *Regiones terrestres prioritarias de México*. Comisión Nacional para el Conocimiento y uso de la Biodiversidad. México.

Arriaga Cabrera, L., E. Vázquez Domínguez, J. González Cano, R. Jiménez Rosenberg, E. Muñoz López, V. Aguilar Sierra (coordinadores). 1998. *Regiones marinas prioritarias de México*. Comisión Nacional para el Conocimiento y uso de la Biodiversidad. México.

Arriaga, L., V. Aguilar, J. Alcocer. 2002. "Aguas continentales y diversidad biológica de México".Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. México.

Beck et al. 2003. Marine Ecoregional Planning Advine. The Nature Conservancy Marine Initiative internal report. September 2003. pp. 9.

Bezaury Creel et al. 2000. Conservation of Biodiversity in Mexico: Ecoregions, Sites and Conservation Targets: Synthesis of Identification and Priority Setting Exercises. The Nature Conservancy internal report. September 2000. pp 117.

Cantú et al. 2003. The gap análisis program on the assessment of nature reserves of Mexico. USGS Gap Analysis Bulletin No. 10. (http://www.gap.uidaho.edu/Bulletins/10/Mexico.htm)

Cantú, C., J.M. Scott, R.G. Wright, and E. Strand. 2002a. An approach to conservation status of current and proposed nature reserves of Mexico.*Journal of Biological Conservation* (in revision).

Dinerstein E., D. Olson, D. Graham, A. Webster, S. Primm, M. Bookbinder, G. Ledec. 1995. A Conservation Assessment of the Terrestrial Ecoregions of Latin America and the Caribbean, The World Bank – World Wildlife Fund, The International Bank for Reconstruction and Development – The World Bank, Washington, D.C., pp. 129 + 9 maps.

Espinosa Romero, M.J., and C. Lasch Thaler. 2002. Compilación de ejercicios de priorirazción de sitios para la conservación del agua dulce y su biodiversidad asociada - Borrador. The Nature Conservancy, Mérida, México.

Groves, C.R., L. Valutis, D. Vosick, B. Neely, K. wheaton, J. Touval, and B. Runnels. 2000. Designing a geography of hope: a practitioner's handbook for ecoregional conservation planning. The Nature Conservancy,. Arlington, VA.

Joint NGO Statement. 2004. Recommendations to COP-7 on a programme of work on protected areas Ander the Convention on Biological Diversity. Birdlife International, Conservation International, Fauna and Flora International, Greenpeace, The Nature Conservancy, Wildlife Conservation Society, World Wildlife Fund, World Resources Institute. pp 6.

APPENDIX A

Table 1: List of Aggregations of Ecoregions

The following table shows the status of ecoregional assessments in Mexico, including those ecoregions which this process will assess. Note: Proposed Ecoregions and Aggregations (Terrestrial, Marine and Freshwater) revised from CONABIO`s and WWF ecoregions (Dinerstein et al. 1995)

ECOREGIONAL ASSESSMENTS FINISHED OR CLOSE TO BEING FINISHED

Sonoran Desert Ecoregional Plan Mex/USA
162-Sonoran Desert
185-Northwest Mexican Coast Mangroves

Northern Gulf of México Ecoregional Plan Mex/USA
Northern Gulf of Mexico Biogeographic Region (partial only coastal lagoons)

Gulf Coast Prairies and Marshes
126-Tamaulipan Pastizal

Chihuahuan Desert Ecoregional Plan Mex/USA
164-Chihuahuan Desert (partial)
167-Meseta Central Matorral
115- Sierra Madre Oriental Pine Oak Forests (partial)

Apache Highlands Ecoregional Plan Mex/USA
164-Chihuahuan Desert (partial)
114-Sierra Madre Occidental Pine Oak Forests (partial)

ECOREGIONAL ASSESSMENTS IN PROGRESS

Tamaulipan Thornscrub Ecoregional Plan Mex/USA
169-Tamaulipan Matorral
165-Tamaulipan Mezquital

California South Coast Ecoregional Plan Mex/USA
113-Sierra Juaréz & San Pedro Martir Pine Oak Forests*
159-California Coastal Sage Scrub

Southern California Marine
Mexican Temperate Pacific Biogeographic Region (partial) to Punta Abre Ojos

Selva Maya, Zoque, Olmeca Ecoregional Plan Mex/Central America
04-Peten-Veracruz Moist Forests
05-Sierra de los Tuxtlas
06-Pantanos de Centla
07-Yucatan Moist Forests
81-Veracruz Dry Forests
82-Yucatan Dry Forests
212-Belizean Coast mangroves
121-Belizean Pine Forests
119- Sierra Madre de Oaxaca Pine Oak Forests (partial – two very small polygons)
214-Mayan Corridor Mangroves
215-Rio Lagartos Mangroves
216-Petenes Mangroves
217-Usumacinta Mangroves
218-Alvarado Mangroves – (partial)

ECOREGIONAL ASSESSMENTS AT A STARTING PHASE

Sea of Cortéz / Nearshore Pacific (Marine) Ecoregional Assessment
Mexican Temperate Pacific Biogeographic Region (partial)
Magdalena Transition Biogeographic Region
Cortesian Biogeographic Region

Baja California Península (Terrestrial) Ecoregional Assessment
161-Baja California Desert
163-Gulf of California Xeric Scrub
166-San Lucan Xeric Scrub
75-Sierra de la Laguna Dry Forests *
113-Sierra Juaréz & San Pedro Martir Pine Oak Forests*
185-Northwest Mexican Coast Mangroves

ECOREGIONAL ASSESSMENTS AT A NEGOTIATIONS PHASE

Central American Pine Oak Forests Ecoregional Assessment Mex/Central America
120-Central American Pine Oak Forests

Mesoamerican Reef Ecoregional Assessment Mex/Central America
Central Caribbean Biogeographic Region (partial)

NEW ECOREGIONAL PLANS

Central American Pacific Dry Forests Ecoregional Assessment Mex/Central America
84-Central American Pacific Dry Forests
188-Tehuantepec/El Manchón Mangroves

Veracruz Moist Forests Ecoregional Assessment
01-Veracruz Moist Forests
218-Alvarado Mangroves – partial

Mexican Pine Oak and Montane Forests Ecoregional Assessment
02-Veracruz Montane Forests
03-Oaxacan Montane Forests
09-Chiapas Montane Forests
10-Sierra Madre de Chiapas Moist Forests
113-Sierra Juaréz & San Pedro Martir Pine Oak Forests*
114-Sierra Madre Occidental Pine Oak Forests (partial)
115- Sierra Madre Oriental Pine Oak Forests (partial)
117-Trans-Mexican Volcanic Belt Pine Oak Forests
118- Sierra Madre del Sur Pine Oak Forests
119- Sierra Madre de Oaxaca Pine Oak Forests
121-Belizean Pine Forests
142-Central Mexican Wetlands
150-Zacatonal
164-Chihuahuan Desert (partial/ small polygons not included in the completed assessment)
08-Chimalapas Montane Forests

Central Mexico Drylands Ecoregional Assessment
78- Bajio Dry Forests
168-Central Mexican Matorral
170-Tehuacán Valley Matorral
167-Meseta Central matorral (small portion not picked up by Chihuahuan desert)

Southern Pacific Dry Forests Ecoregional Assessment
223-Sonora/Sinaloan Transition Dry Forests
75-Sierra de la Laguna Dry Forests *
76-Sinaloan Dry Forest

77-Jalisco Dry Forests
79-Balsas Dry Forests
80-Southern Pacific Dry Forests
83-Chiapas Depression Dry Forests
99-Islas Revillagigedo Dry Forests
185-Northwest Mexican Coast Mangroves
186-Marismas Nacionales/San Blas Mangroves
Mexican South Pacific Coast mangroves
Tehuantepec-El Manchon mangroves

Gulf of Mexico Marine Ecoregional Assessment Mex/USA
Refinement of filters used in the ongoing Caribbean Ecoregional Assesment
Northern Gulf of Mexico Biogeographic Region (partial)
Gulf of Mexico Biogeographic Region

Mexican Pacific Transition Marine Ecoregional Assessment
Mexican Tropical Pacific Biogeographic Region
Clipperton and Revillagigedo Islands Biog. Region (budget does not include Clipperton)

Chiapas Nicaragua Marine Ecoregional Assessment Mexico/ Central America
Pine and Oak Forest of Mesoamerica: Chiapas Nicaragua Biogeographic Region

ADDITIONAL CONSIDERATIONS

Marine Ecoregions
A decision still needs to be made about including deep sea and pelagic biodiversity, which would represent a more complex analysis requiring different capacities.

Freshwater Ecoregions
Ecological Drainage Units of Mexico

Mangrove Ecoregions
Mangroves – although analyized with the adjacent terrestrial ecoregions, additional analysis will be conducted more broadly to prioritize mangroves overall based on irreplaceability, vulnerability and representativity.

Baja Forests (attributed with *)
Although these forests will be analyzed in context with the Baja terrestrial ecoregions, they will also be analyzed in context with all Mexican Dry, Pine Oak and Montane Forests.

DESIGN
Initially executed as Ecoregional Assessments, will become full Ecoregional Plans when specific action plans for functionally coherent sections are finalized.

Table 2. Draft Ecological Drainage Units for Mexico and corresponding WWF Freshwater Ecoregions

Draft EDU Number	EDU Name	WWF 2000 Freswater Ecoregion Number	WWF 2000 Freshwater Ecoregion Name	Number of subwatersheds*
1	Ameca	63	Santiago	1
1	Ameca	64	Manantlan-Ameca	23
2	Armeria-Coahuayana	64	Manantlan-Ameca	26
3	Baja California Centro Este	7	South Pacific Coast	80
4	Baja California Noreste	7	South Pacific Coast	9
4	Baja California Noreste	12	Colorado	1
5	Baja California Noroeste	7	South Pacific Coast	41
6	Baja California Sureste	7	South Pacific Coast	10
7	Baja California Suroeste	7	South Pacific Coast	37
8	Balsas	69	Lerma	14
8	Balsas	70	Balsas	275
9	Belize - Northern	75	Grijalva-Usumacinta	90
10	Coatzacoalcos	73	Coatzacoalcos	14
11	Costa Chica-Río Verde	70	Balsas	1
11	Costa Chica-Río Verde	74	Tehuantepec	35
12	Costa de Chiapas	74	Tehuantepec	68
13	Costa de Jalisco	64	Manantlan-Ameca	42
14	Costa de Michoacán	64	Manantlan-Ameca	4
14	Costa de Michoacán	70	Balsas	9
15	Costa de Oaxaca	74	Tehuantepec	4
16	Costa Grande	74	Tehuantepec	23
17	Cuencas Cerradas del Norte	16	Guzman	19
17	Cuencas Cerradas del Norte	17	Rio Conchos	1
18	El Salado	19	Mapimi	25
18	El Salado	66	Llanos El Salado	38
18	El Salado	68	Tamaulipas-Veracruz	2
19	Grijalva-Coast	75	Grijalva-Usumacinta	20
20	Grijalva-Mountains	75	Grijalva-Usumacinta	32
21	Huicicila	63	Santiago	8
21	Huicicila	64	Manantlan-Ameca	1
22	Lerma-Santiago	63	Santiago	60
22	Lerma-Santiago	64	Manantlan-Ameca	1
22	Lerma-Santiago	65	Chapala	12
22	Lerma-Santiago	66	Llanos El Salado	2
22	Lerma-Santiago	69	Lerma	72
22	Lerma-Santiago	70	Balsas	2
23	Lower Río Bravo	20	Lower Rio Grande/Bravo	21
25	Lower Río Bravo	21	Rio Salado	1
24	Lower Río Colorado	12	Colorado	2
26	Mapimí	19	Mapimi	5
26	Mapimí	20	Lower Rio Grande/Bravo	1
27	Middle Río Bravo	16	Guzman	1
28	Nazas-Aguanaval	19	Mapimi	22
29	Papaloapan	71	Papaloapan	36

Draft EDU Number	EDU Name	WWF 2000 Freswater Ecoregion Number	WWF 2000 Freshwater Ecoregion Name	Number of subwatersheds*
30	Presidio-San Pedro	19	Mapimi	2
30	Presidio-San Pedro	62	Sinaloan Coastal	6
30	Presidio-San Pedro	63	Santiago	13
31	Pánuco	67	Rio Verde Headwaters	3
31	Pánuco	68	Tamaulipas-Veracruz	67
31	Pánuco	69	Lerma	2
32	Río Salado	21	Rio Salado	5
33	Río San Juan	19	Mapimi	2
33	Río San Juan	23	Rio San Juan	78
34	Río Conchos	17	Rio Conchos	5
35	San Fernando-Soto la Marina	20	Lower Rio Grande/Bravo	43
35	San Fernando-Soto la Marina	68	Tamaulipas-Veracruz	77
36	Sinaloa	61	Sonoran	2
36	Sinaloa	62	Sinaloan Coastal	60
37	Sonora Norte	61	Sonoran	15
38	Sonora Sur	16	Guzman	4
38	Sonora Sur	61	Sonoran	37
38	Sonora Sur	62	Sinaloan Coastal	6
39	Tehuantepec	74	Tehuantepec	19
40	Tuxpan-Nautla	68	Tamaulipas-Veracruz	28
40	Tuxpan-Nautla	71	Papaloapan	4
41	Usumacinta-Coast, Centla	75	Grijalva-Usumacinta	69
42	Usumacinta-Mountains	75	Grijalva-Usumacinta	25
43	Yucatán	75	Grijalva-Usumacinta	62
43	Yucatán	76	Yucatán	55
44	Yucatán-Este	75	Grijalva-Usumacinta	4
44	Yucatán-Este	76	Yucatán	1
45	Yucatán-Norte	76	Yucatán	1
46	Yucatán-Oeste	75	Grijalva-Usumacinta	3

* EDUs are composed of sub-watersheds. This column shows the number of the component sub-watersheds in each EDU that falls into the noted WWF freshwater ecoregion.