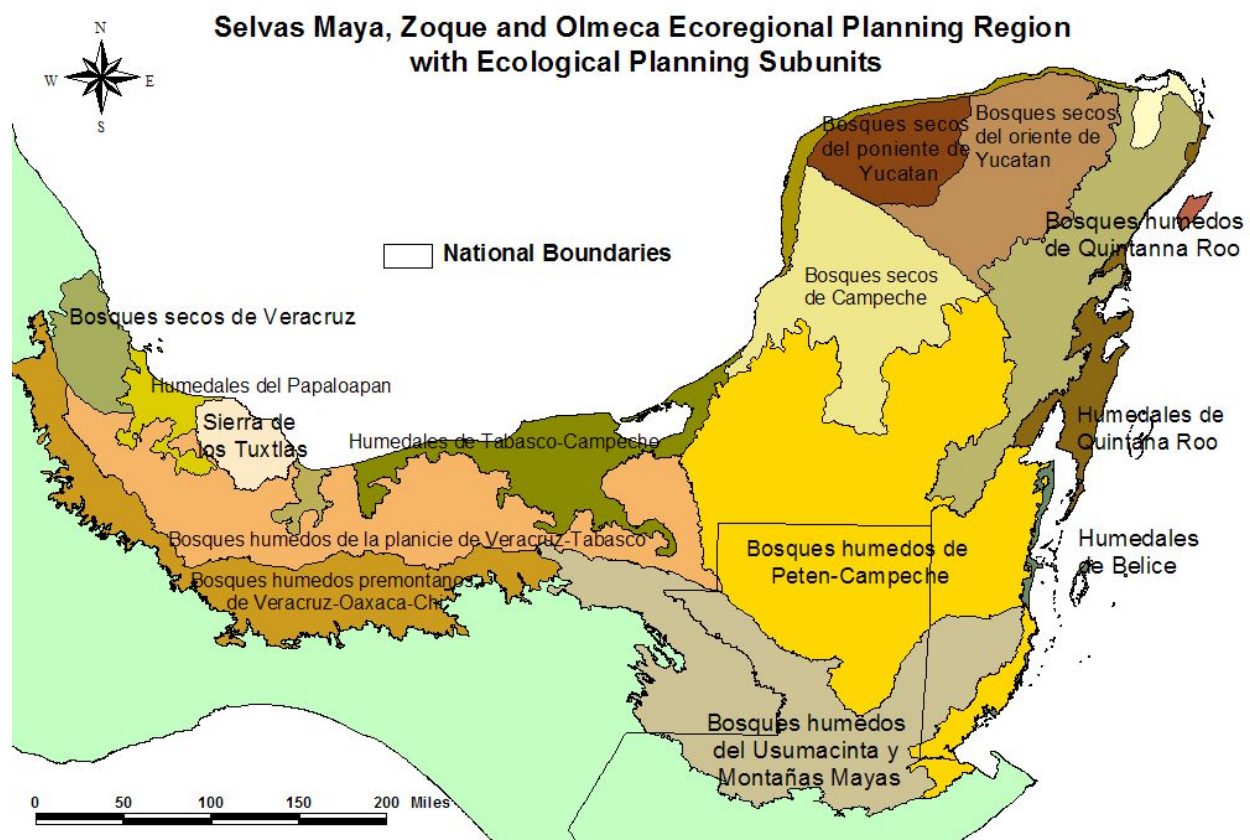


# Belize Protected Areas Policy and System Plan:

## RESULT 2: Protected Area System Assessment & Analysis

### Regional Perspective

Previous to the NPAPSP result 2 analyses, a tri-national Ecoregional planning effort for “Las Selvas Maya, Zoque and Olmeca” was started. The effort is being implemented as a joint project by Pronatura-Península de Yucatán (Mexico), Ecosur (Mexico), Defensores de la Naturaleza (Guatemala), TNC (Mexico, Guatemala, Belize), WCS (Mexico, Guatemala, Belize) and Programme for Belize.



The Ecoregional plan proposes a network or portfolio of strategic sites which will permit the conservation of natural communities, ecological processes and species that best represent and guarantee the biodiversity of the Selva Maya Ecoregion. The sites are selected through a rigorous analysis of existing information on biodiversity within the ecoregion. The Plan also develops strategies for the conservation

of the sites identified. The strategies are based on the socio-economic situation and culture of the Ecoregion, existing opportunities and threats and institutional capacity.

An Ecoregional classification system has been developed to group the ecoregions into management and planning units at a macro scale. The objective is to develop ecoregional plans for each planning unit. We recognize that only portions of certain ecosystems will be conserved, however, considering current anthropogenic threats, it is important to identify the sites that are most representative of the biodiversity of the Ecoregion, and develop the actions necessary to conserve them. This will be realized through the Ecoregional planning process.

In brief: The ecoregional plan intends to identify conservation targets on a regional rather than national basis. The underlying philosophy being that species do not recognize political boundaries but follow ecological boundaries.

The process followed by the Ecoregional Planning Process, had so many overlaps with the NPAPSP result 2 efforts that efforts were coordinated from the very beginning of the study. Both sides gathered and shared data. The principal difference between the two processes being the scale on which each worked. Because of the large size of the Ecoregional Planning Unit, data input was on a relatively coarse scale. The Belize effort could work on a finer scale and thus could access additional data for fine-tuning of the process. Also note that the Ecoregional Planning Process did not address marine conservation efforts (Both the World Resource Institute - WRI and TNC had complementing marine data for the entire Caribbean region)!

### **Methodology:**

The principal methodology exists using a GIS system and combine various layers that indicate ecological (and social!) variability. The principal layers developed were:

- ❖ Climate
- ❖ Potential Vegetation Cover
- ❖ Actual Vegetation Cover
- ❖ Geology
- ❖ Soils
- ❖ Geo-morphology
- ❖ Protected Areas

In the case of the actual vegetation cover, it is worth to note the high diversity of habitats/vegetation types in Belize when compared to the rest of the Ecoregional Planning Area. This high diversity will have consequences in the choice of strategic conservation sites.

Fundamental in the analysis were the various “human needs and human impact” layers such as:

- ❖ Roads
- ❖ Communities
- ❖ Poverty assessment
- ❖ Urban development
- ❖ Agriculture
- ❖ Aquaculture
- ❖ Mining
- ❖ Tourism
- ❖ Fires

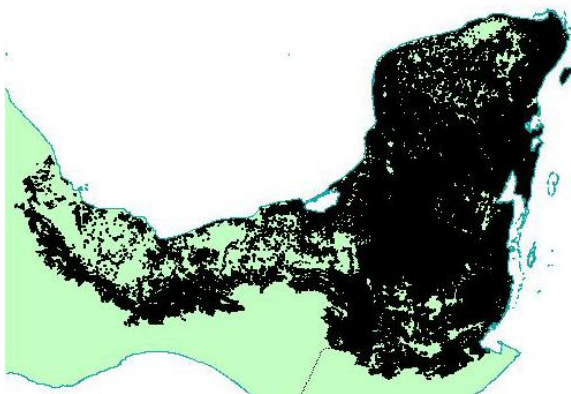
These latter inputs were translated into a “cost” layer. The cost does not indicate a numerical value, but rather the amount of effort needed to conserve a particular area.

Notice on this “cost” layer the large human influence in vast areas of the Mexican planning unit and in part of the Guatemalan planning unit. Belize as a whole has a much more moderate cost attached.

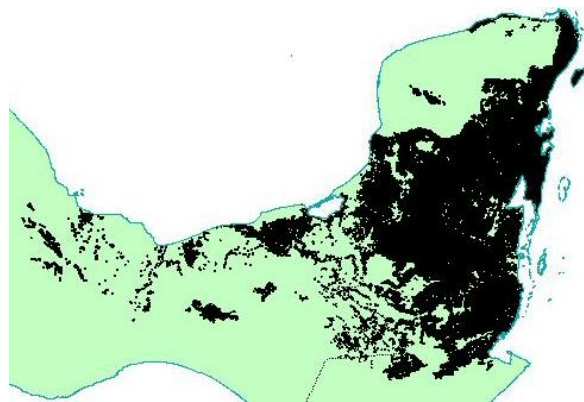
Furthermore the Ecoregional Planning Effort incorporated the results of a “Domain” analysis. Domain” is a software package that calculates potential distribution of species. This is particularly useful when insufficient data exist as will typically be the case with species distribution data. The Domain analysis helps answering the question: “Does our protected area system cover the distribution of species of conservation concern?” It uses various layers as inputs such as:

- Climate
- Geology
- Soil types
- Vegetation cover
- Altitude
- Known distribution data

The Domain analysis was carried out for a large number of species which were considered of conservation interest. These included species of actual conservation concern (such as the Jaguar) but also charismatic species (such as the Blue Morpho Butterfly)

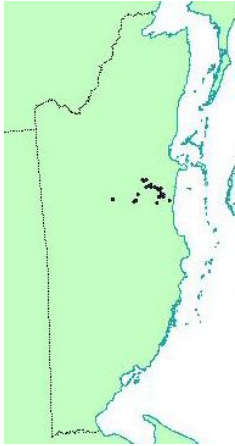


Potential Distribution of the Jaguar



Potential Distribution of the Blue Morpho Butterfly.

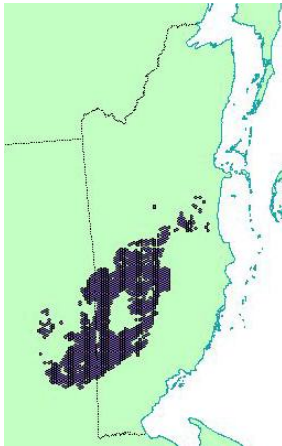
Other species of conservation concern include endemic species. A few of such endemic species are listed below together with their potential distribution map based on the Domain analysis.



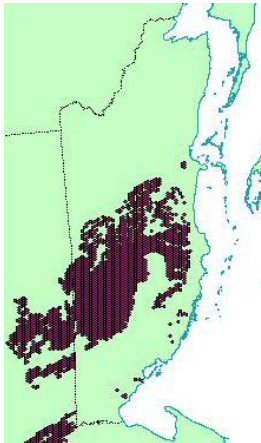
*Louteridium chartaceum*: Shrub endemic to the Peccary Hills near Belize City.



*Passiflora urbaniana*: Which is a small vine endemic to the savannas of Belize



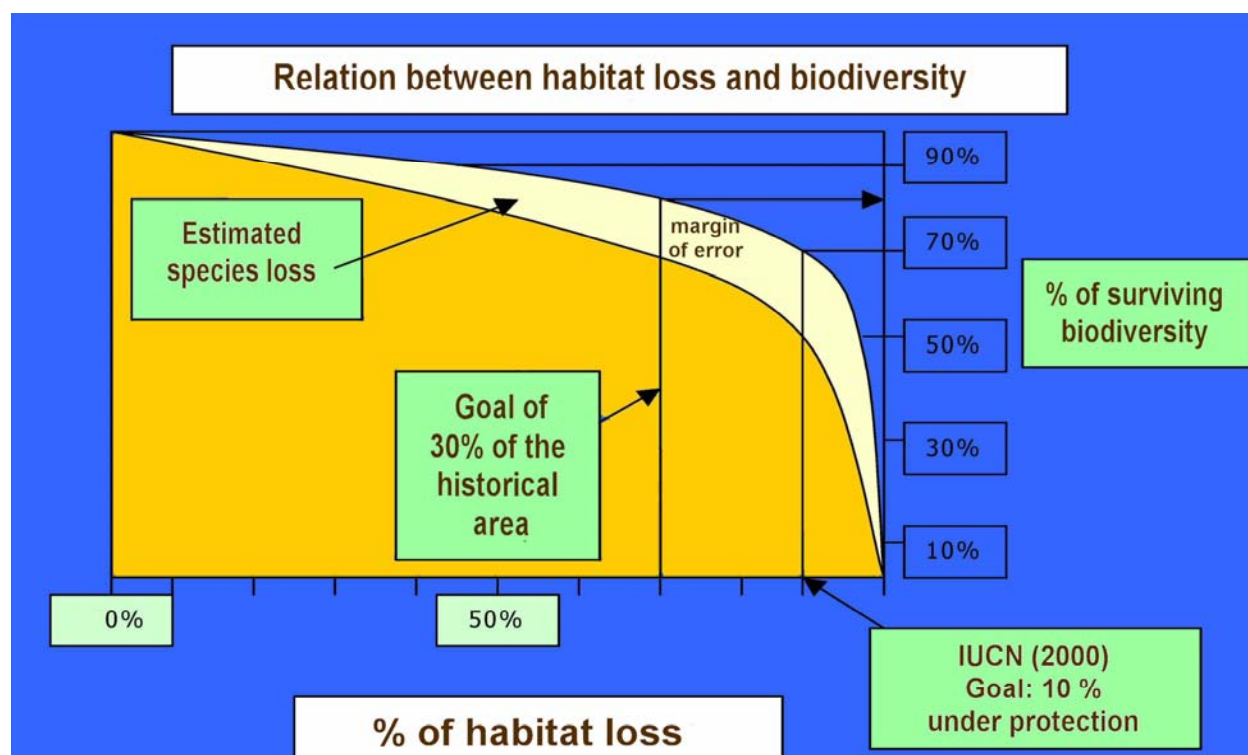
*Rana juliani*: Is a frog endemic to the Maya Mountains. Has not been confirmed from Guatemala but based on this potential distribution map should be expected here.



*Citharacanthus meermani* this is a Tarantula thought to be endemic to the Belizean Maya Mountains. While it has not been confirmed from the Guatemala part of the Maya Mountains but based in this potential distribution analysis it should be expected there.

All these data were analyzed using SPOT software. SPOT is a conservation planning optimization tool (software) that delivers decision support for reserve system design. SPOT finds reasonably efficient solutions to the problem of selecting a system of spatially cohesive sites that meet a suite of biodiversity targets. Given reasonably uniform data on species, habitats and/or other relevant biodiversity features and surrogates for a number of planning units SPOT minimizes the “cost” while meeting user-defined biodiversity targets. In many aspects SPOT is very similar to MARXAN, the tool that was used for the NPAPSP result 2 analysis.

Fundamental in this analysis was the underlying thought that a minimum area will be required for each habitat/ecosystem. The IUCN recommends a minimum of 10% under protection for each habitat. Theoretically, this would theoretically enable the survival of 50 - 70% of the extant species. The ecoregional planning initiative used a minimum of 30% which would allow the survival of 65 - 85% of the species.



The draft results of the Ecoregional Planning Analysis are depicted in the figures on the following pages. The dark hexagons indicate conservation priorities. Notice the large resemblance to existing PA system in Belize. But also note substantial gaps in the coastal region and in Central Belize. Some (parts of) existing PA's were not identified based on large “cost” (threats), and/or on the fact that similar goals could be met elsewhere in the planning region.

Final results will be available mid-2005 and published on the website <http://www.selvamaya.org>



