Assessing vulnerability and species range shifts in Madagascar

July 19th, 2011
Context

• January 2008: workshop, Assessing the Impacts of Climate Change on Madagascar’s Biodiversity and Livelihoods, in Antananarivo, Madagascar

• Objectives:

- to examine the threats to livelihoods and marine and terrestrial biodiversity in Madagascar
- to generate recommendations for building resilience and adapting to the impacts of climate change for ECS and human livelihoods
Technical recommendations

- Ecological protection and restoration to build ecosystem resiliency in the face of climate change;
- Protection and sustainable management of forest corridors to maintain adequate habitat;
- Reinforcing terrestrial protected areas planning processes by integrating climate change impact;
- Recognition of the links between human well-being, biodiversity and access to natural resources;
Climate Change Adaptation for Conservation in M/car

• Conservation International received funding from Mac Arthur Foundation (2009-2011) and conducted research:

Goal A. Terrestrial Activities: To Develop an Action Plan to Achieve Forest Connectivity in Priority Areas

➢ Feasibility studies on restoring fragmented forest
✓ Modeling of plant and animal species’ range shifts
✓ Surveying and testing methods for natural forest regeneration in the many habitat types and social settings of Madagascar
✓ Costing of restoration for priority areas.
The Durban Vision:

Tripling Madagascar’s Protected Areas

“... our decision to increase the protected areas from 1.7 million hectares to 6 million hectares over the next five years ...”

Corresponds to CBD parties' commitment of 10% of the national territory by 2010.
Science informing policy: Priority setting at the National level

- Use of data on threatened species: Vertebrates, plants, invertebrates;
- Use of conservation planning tools (MARXAN and ZONATION).

- Consensus on Priority sites for the creation of new protected areas
- 7.2 millions hectares of terrestrial and marine protected areas identified
Modeling the effects of climate change on species distributions

METHODS
Environmental Niche Modelling with Maximum Entropy (Maxent)
3 types of input data available:

i. Distribution Data of 1071 Species belonging to 6 taxa

ii. Climate Data (current & future)

iii. Forest Cover Data
% Contracting Species

Unlimited Adaptation & Dispersal

Limited Adaptation & Dispersal

% Contracting Species

- Ants
- Lemurs
- Butterflies
- Plants
- Frogs
- Reptiles
- All Species

2000 to 2050
2000 to 2090
% Range Protected within SAPM (1071 Species)

Unlimited Adaptation & Dispersal

Year = 2000 2050 2090

Limited Adaptation & Dispersal

2000 2050 2090

% Species in category

10 to 25% 5 to 10% 0 to 5% 0%

% Species in category
Conservation Planning using future modelled species distributions

With Zonation software
Interactions between 2000<>2050<>2090

The best:
2 %
2 – 5 %
5-10 %
10-20 %
80-100 %
RECOMMENDATIONS: TECHNICAL ASPECT OF RESTORATION

• Understand the dynamic of the zone to restore: Identify factors which determine the evolution of the landscape and guarantee the success of restoration;

• Identify the objectives of the restoration with stakeholders

• Determine with the local population the activities to undertake

• Define the benefit offered by the restoration and the recipients

• Define the adequate techniques of restoration

• Develop a collaboration and synergy between various sectors
Priority zones of restoration in Madagascar
MISAOTRA TOMPOKO