



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.

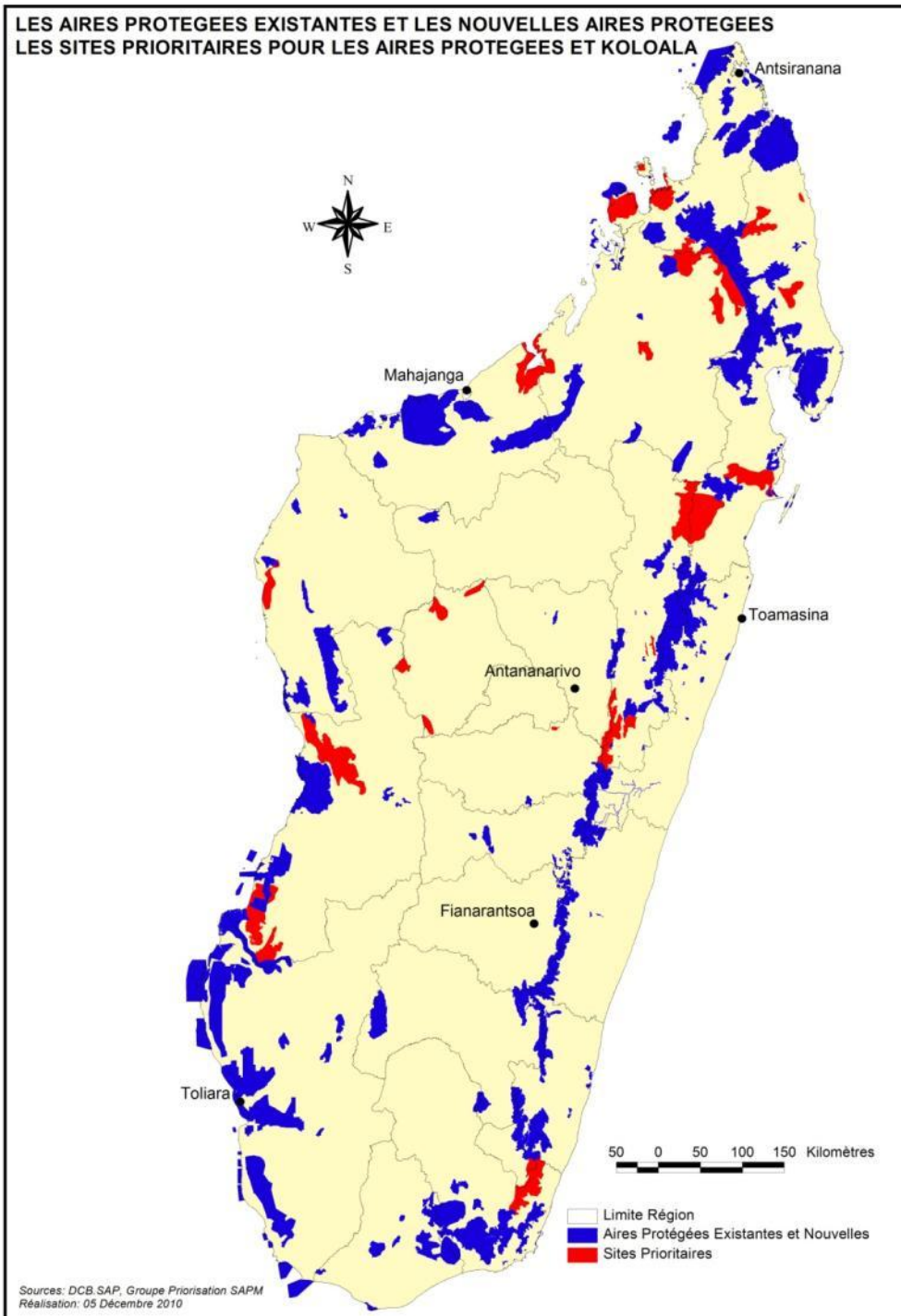


Science informing policy: Priority setting at the National level

- 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:

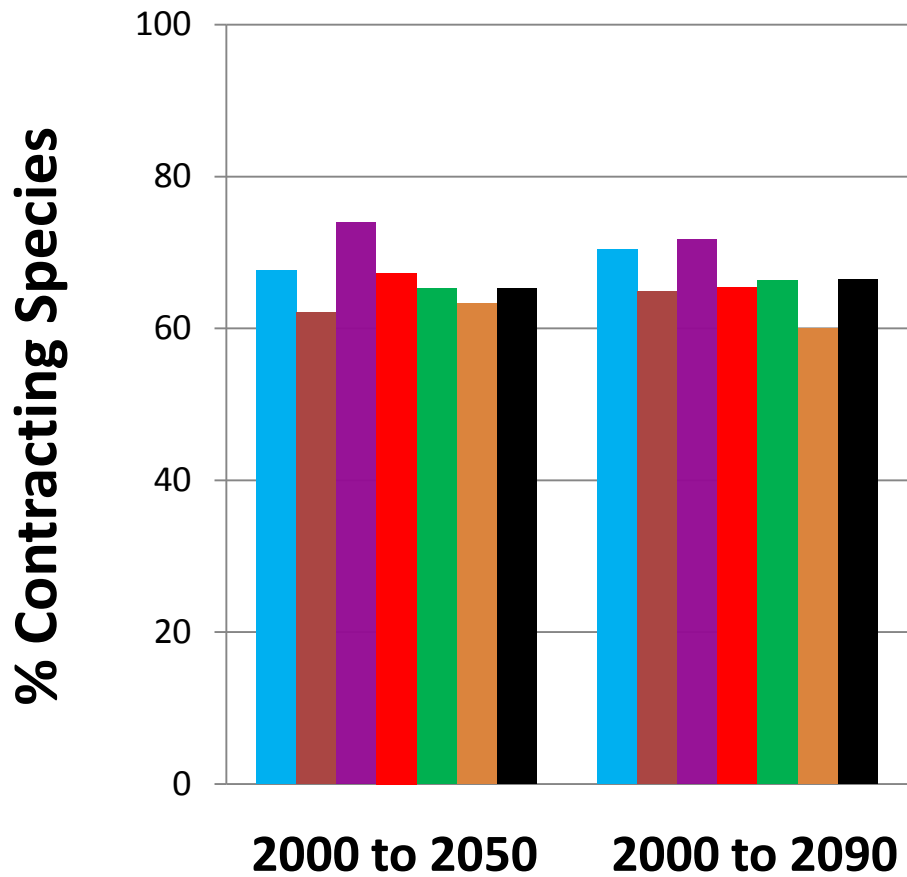
- i. Distribution Data of 1071 Species belonging to 6 taxa**
- ii. Climate Data (current & future)**
- iii. Forest Cover Data**

% Contracting Species

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

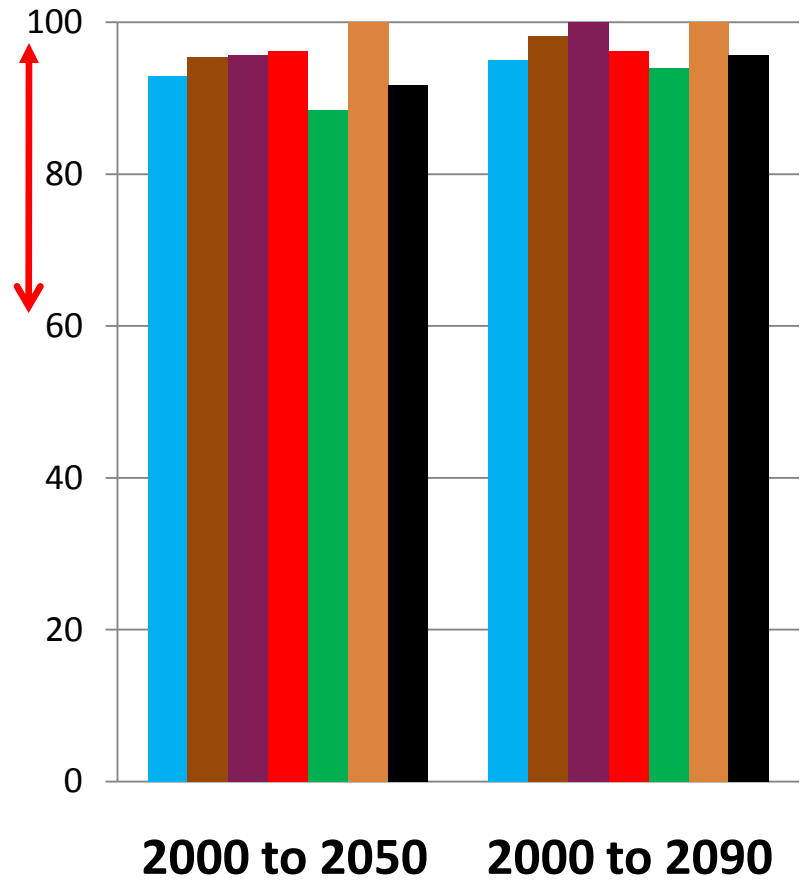
Unlimited

Adaptation & Dispersal

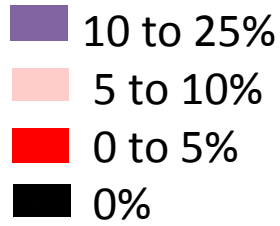


Limited

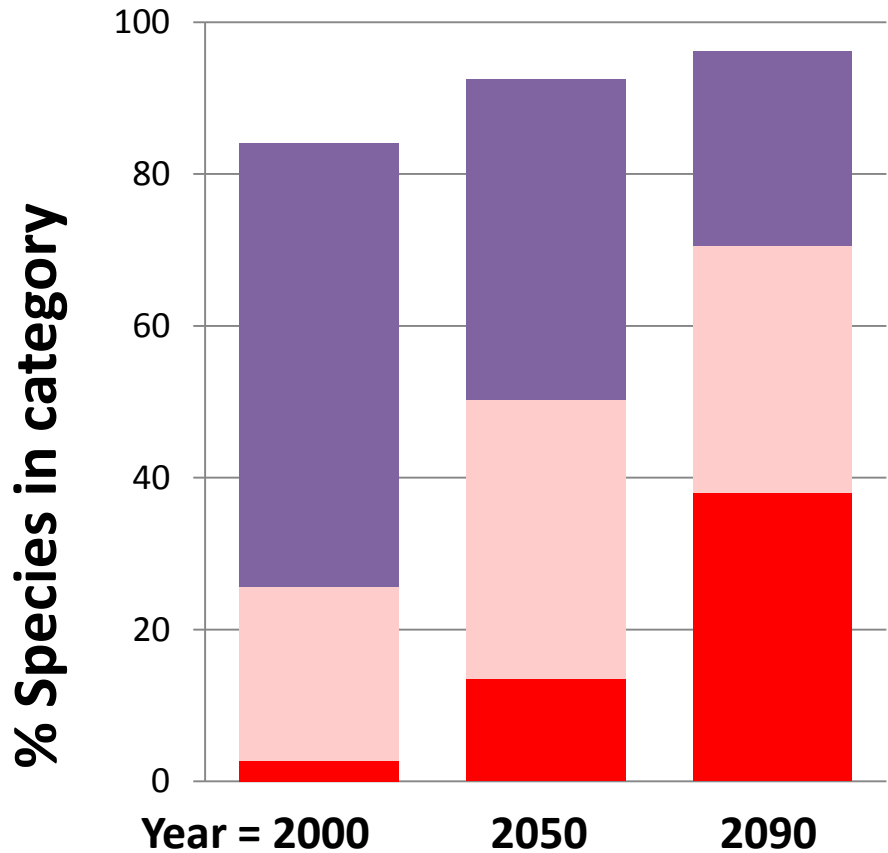
Adaptation & Dispersal



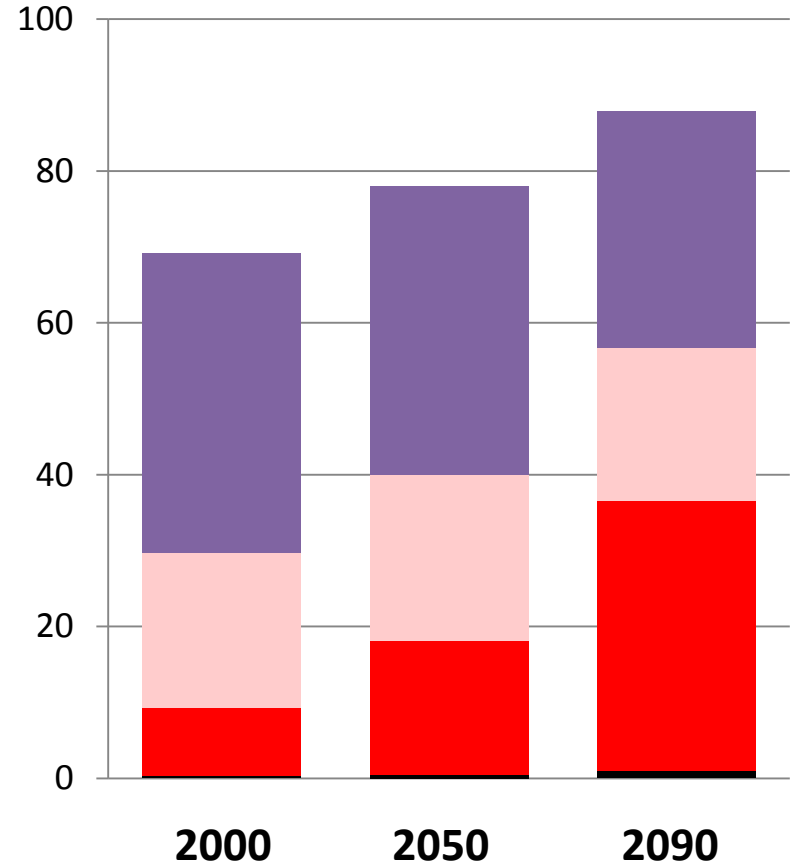
% Range Protected within SAPM (1071 Species)



Unlimited Adaptation & Dispersal



Limited Adaptation & Dispersal



**Conservation Planning using
future modelled species
distributions**

With Zonation software

NoAdapt

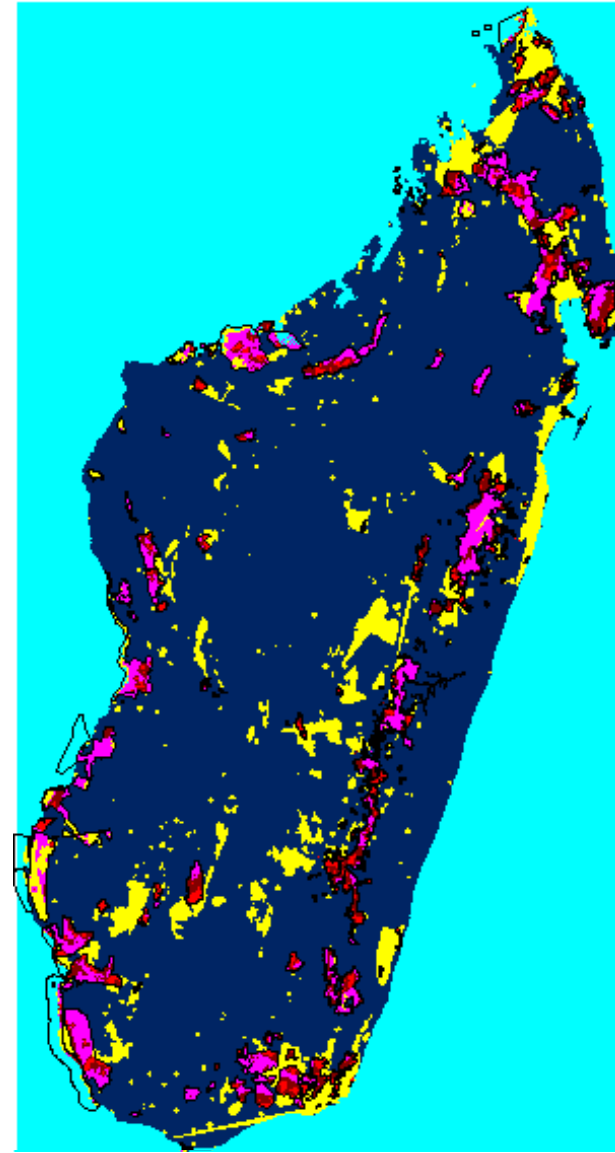
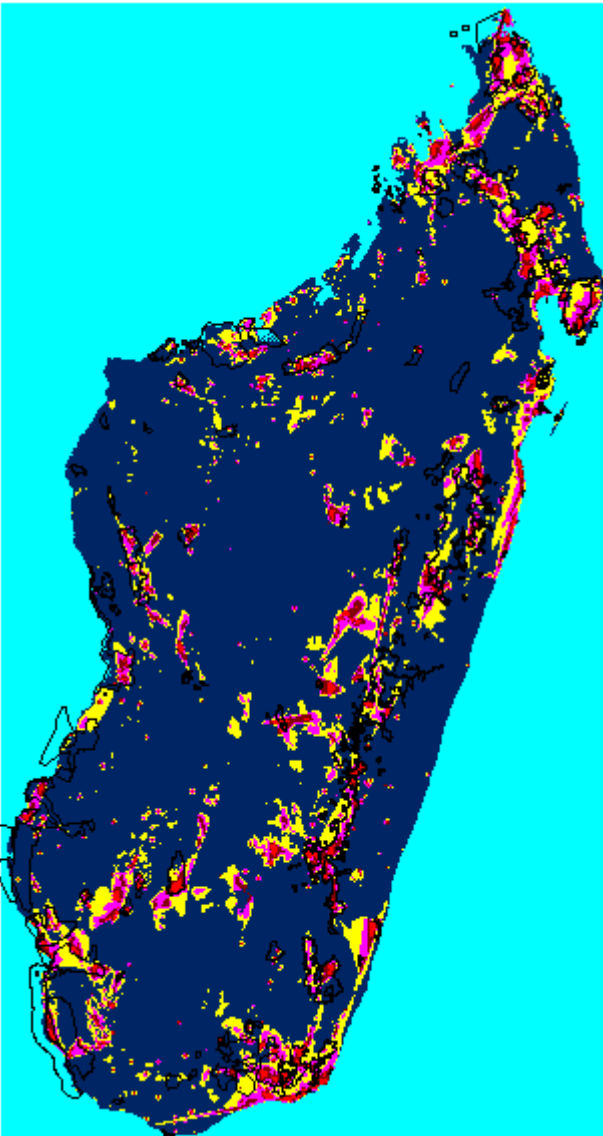
LimitedDispersal

Smooth

Interactions between 2000<>2050<>2090

NoSAPM

SAPM



The best:

2 %

2 – 5 %

5-10 %

10-20 %

80-100 %

IPCC A2
Scenario

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



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