A CONSERVATION PLANNING UNIT FOR THAILAND

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Thailand Quick Facts

- Situated in Southeast Asia
- Occupies 513 120 km² of land
- It is the 50th largest country worldwide
- Its largest city and capital is Bangkok
THREATS TO BIODIVERSITY

- Poaching
- Deforestation
- Illegal Timber Harvesting
- Destructive Fishing Practices
- Pollution
- Infrastructure Development
THAILAND’S 18 ECOREGIONS
CURRENT PROTECTED AREAS

- National Parks in the Thai Highlands: 60
- Wildlife Sanctuaries: 39
  - Forest Parks: 35
- National Parks in Isan and Adjacent Areas: 28
- National Parks in Western, Central and Eastern Thailand: 24
  - National Parks in Southern Thailand: 19
  - Marine National Parks: 20
  - Other Protected Areas: 17
CONSERVATION TARGETS (PERCENTAGE AND SPECIES PENALTY FACTORS)

Conservation Target: 20%
Penalty Factor: 10
Area (km²): 2932
Area (km$^2$): 8672

Conservation Target: 15%
Penalty Factor: 10
Area (km²): 1614

Conservation Target: 25%
Penalty Factor: 10
Area (km²): 6201

Conservation Target: 12%
Penalty Factor: 10
Area (km²): 514 151

Conservation Target: 10%
Penalty Factor: 10
Area (km²): 5528

Conservation Target: 15%
Penalty Factor: 10
Peninsular Malaysian Montane Forests

Area (km²): 2598

Conservation Target: 35%
Penalty Factor: 10
Conservation Target: 10%
Penalty Factor: 10

Area (km²): 44 186
Peninsular Malaysian Rain Forests

Area (km²): 23,918

Conservation Target: 10%
Penalty Factor: 10
Area (km²): 97 170

Conservation Target: 10%
Penalty Factor: 10
CONSERVATION planning units (ecological)

Methods:

• Open ArcView
• Add Admin layer, Ecoregions and Waterbasins layers
• Waterbasins downloadable from http://waterbase.org/download_data.html
• Go to View > Geoprocessing> Clip
• Input 1 is the waterbasin, input 2 in the admin 0. Do the same with ecoregions.
• Once both is completed, Union the two. Done under View> Geoprocessing > Union
CONSERVATION planning units (Systematic)

**Methods:**

- Open ArcView
- Add Admin 0 layer
- Click on Hexagons > with respect to selected features in a theme > Admin 0 > Use all records > Hexagons > Pick parameters.

I have 1053 Hexagons which act as corridors for my conservation plan.
This map shows the current protected areas in Thailand. From this map we can deduce that although Thailand has many protected areas, the conservation targets I have chosen will not all be conserved under these protected areas. This can be assessed by doing a Marxan run.
This is an overlay of the current protected area in Thailand with the artificial land-uses.

This map will be used when doing the final Marxan run to assess the current protected area network and setting up new areas which will need to be conserved under the chosen penalty factor and conservation targets I chose, which was stated earlier.
Marxan Core Concepts: CARE Principles

**Connectivity**
- Fragmentation
- As little fragmentation as possible needed

**Adequacy**
- Larger species = Larger Areas
- Smaller species = Smaller Areas

**Representation**
- Hexagons which are the corridors

**Efficiency**
- Least area possible, conserving most species
Marxan Parameters Needed for Planning Unit:

- Boundary Length Modifier: 2
- Repeat Runs: 1000
- Species Mining if Proportion of Target Lower than: 0.95
- Run Mode: Simulated Annealing followed by Iterative
**MARXAN PARAMETERS NEEDED FOR PLANNING UNIT CONT.:**

<table>
<thead>
<tr>
<th>Annealing Controls:</th>
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<tbody>
<tr>
<td>• Number of Iterations: 10000</td>
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<td>• Temperature Decreases: 1000</td>
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<td>• Iterative Improvement Type: Normal Iterative Improvement</td>
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<tr>
<th>Cost Threshold: Enabled:</th>
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<tr>
<td>• Threshold: 1600</td>
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<tr>
<td>• Penalty Factor A: 9</td>
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<td>• Penalty Factor B: 2</td>
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<td>• Starting Proportion: 0</td>
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Systematic CONSERVATION planning

**Marxan Results**

- For current conservation targets, not all my targets will be conserved and there will need to be at least 50 km² of area added to existing protected areas to conserve all my conservation features.

- For future conservation targets, I believe that all my conservation features will be conserved.
**SOURCES OF DATA, ATTRIBUTION AND ACKNOWLEDGEMENTS**

<table>
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<th>Sites:</th>
<th>Programmes:</th>
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<tbody>
<tr>
<td>• Gbif.org</td>
<td>• Idrisi Selva</td>
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<tr>
<td>• Protectedplanet.net</td>
<td>• DIVA-GIS</td>
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<td>• Creativecommons.org</td>
<td>• ArcView</td>
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