

Spatial planning for multiple benefits from REDD+

¿Qué información se puede desprender
de la MRV?

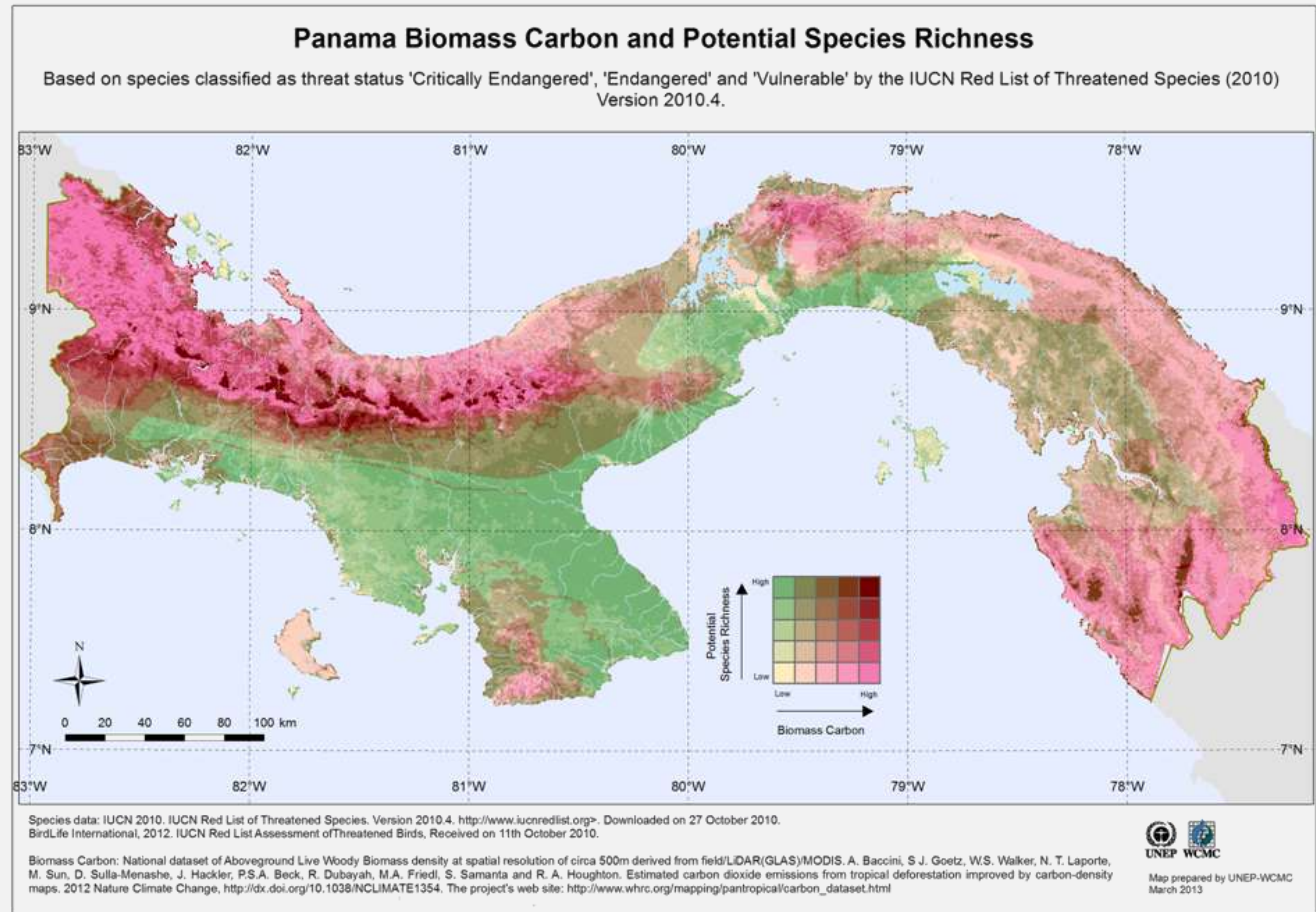
Lucy Goodman



- Spatial planning for enhancing multiple benefits from REDD+
- Información MRV
- Focus in on Marxan - how can Marxan be applied for REDD+, and what are its drawbacks



Multiple benefits are unevenly distributed in space

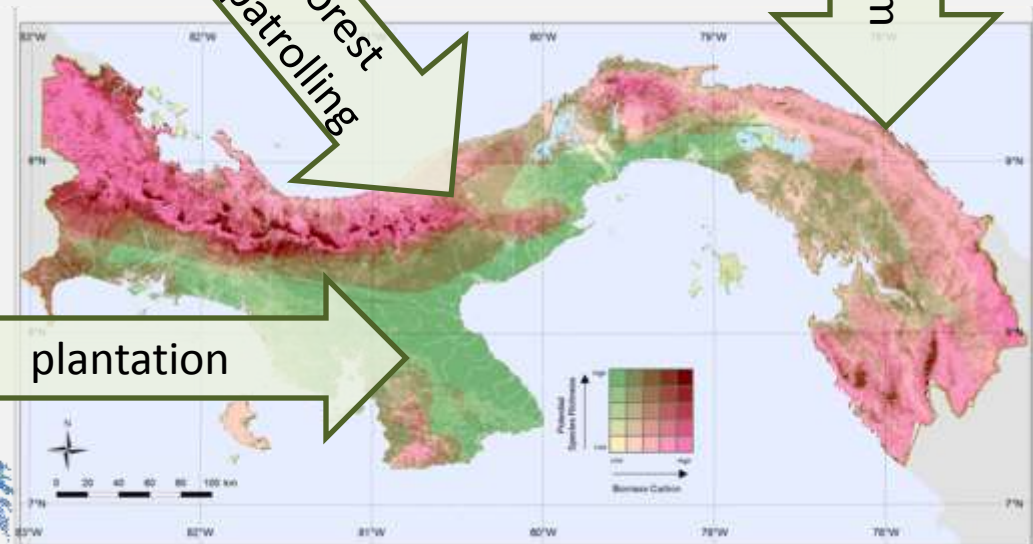


Different REDD+ interventions may be implemented in different regions

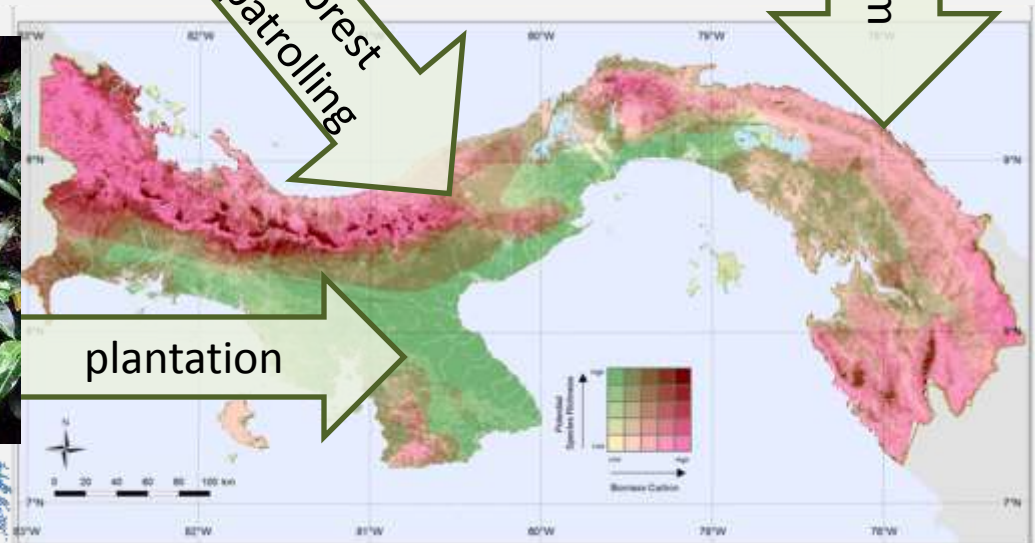


Forest
patrolling

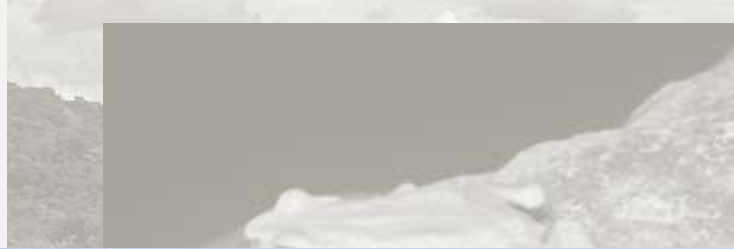
Ecotourism



Where you
implement different
REDD+ interventions
will have variable
impacts on multiple
benefits



Where you
implement different
REDD+ interventions
will also impact on
the **potential risks**



MRV information that could be used for spatial planning

- Natural forest cover
- Degraded forest cover
- Biodiversity indicator species ranges



Información MRV que podría utilizarse en la planificación espacial

- cubierta de bosque natural
- cubierta de bosque degradado
- áreas de distribución de especies indicadores de biodiversidad

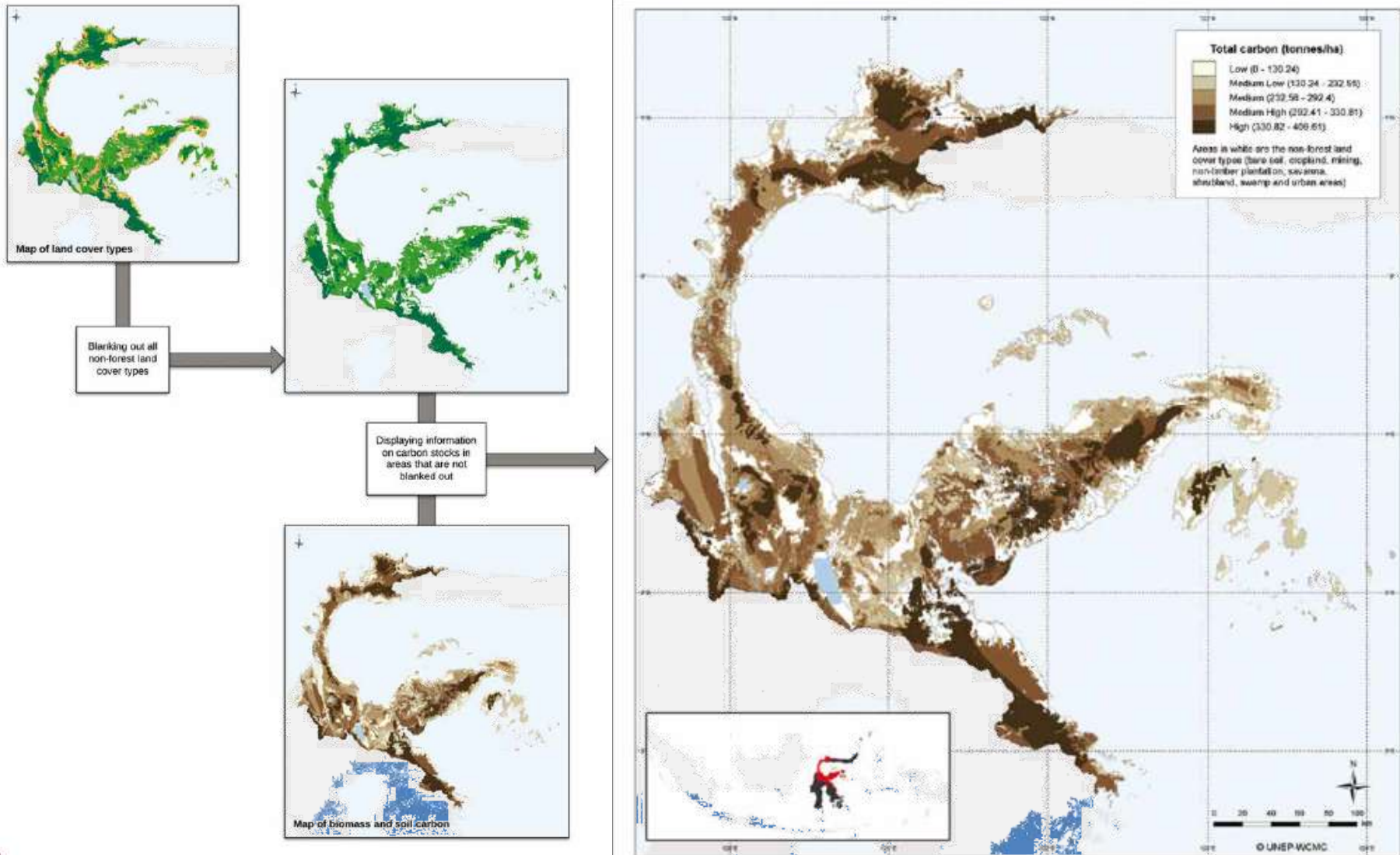


What tools are available to help countries address the complex spatial planning challenges that REDD+ creates?

- **Spatial overlays**
- **Marxan**
- Marxan with zones
- Zonation
- INVEST



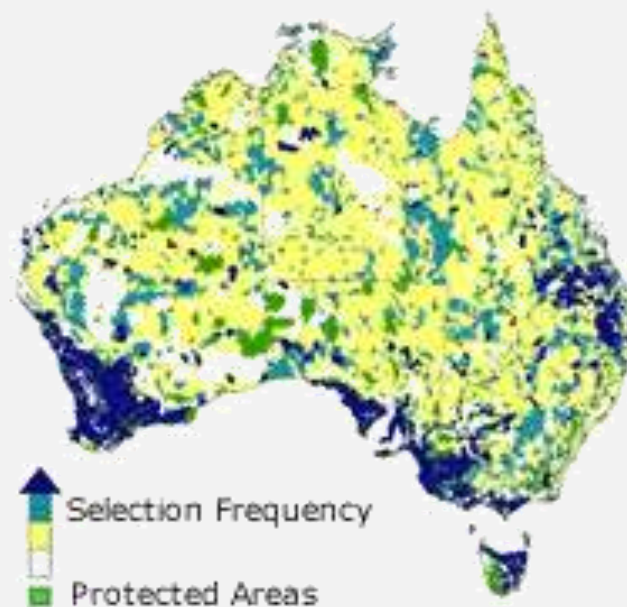
Spatial overlay to highlight - Potential areas for REDD+ actions to maintain forest in Central Sulawesi



Marxan

Informing Conservation Decisions Globally

- Marxan is a type of spatial decision-support software used for conservation planning
- It can consider multiple spatial targets set by decision makers

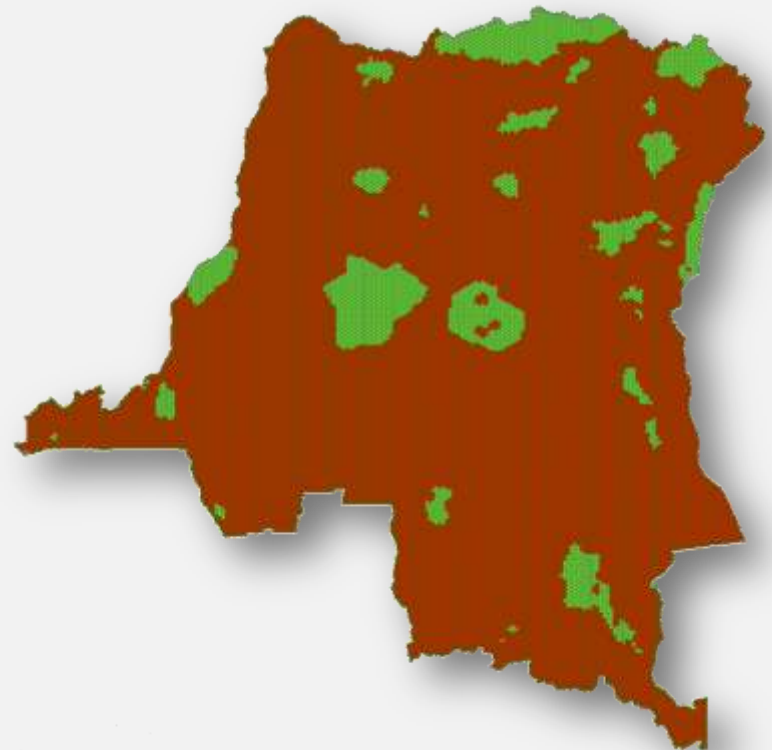


<http://www.uq.edu.au/marxan/>

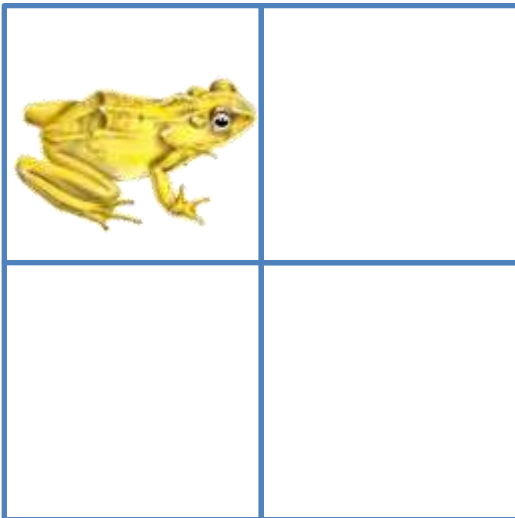
Marxan

Informing Conservation Decisions Globally

- Marxan selects areas which meet the user defined targets, while minimising a constraint of interest (implementation cost, area)
- Output - a REDD+ priority map and the “cost” (\$, km²) associated with this priority map



How Marxan works for conservation planning

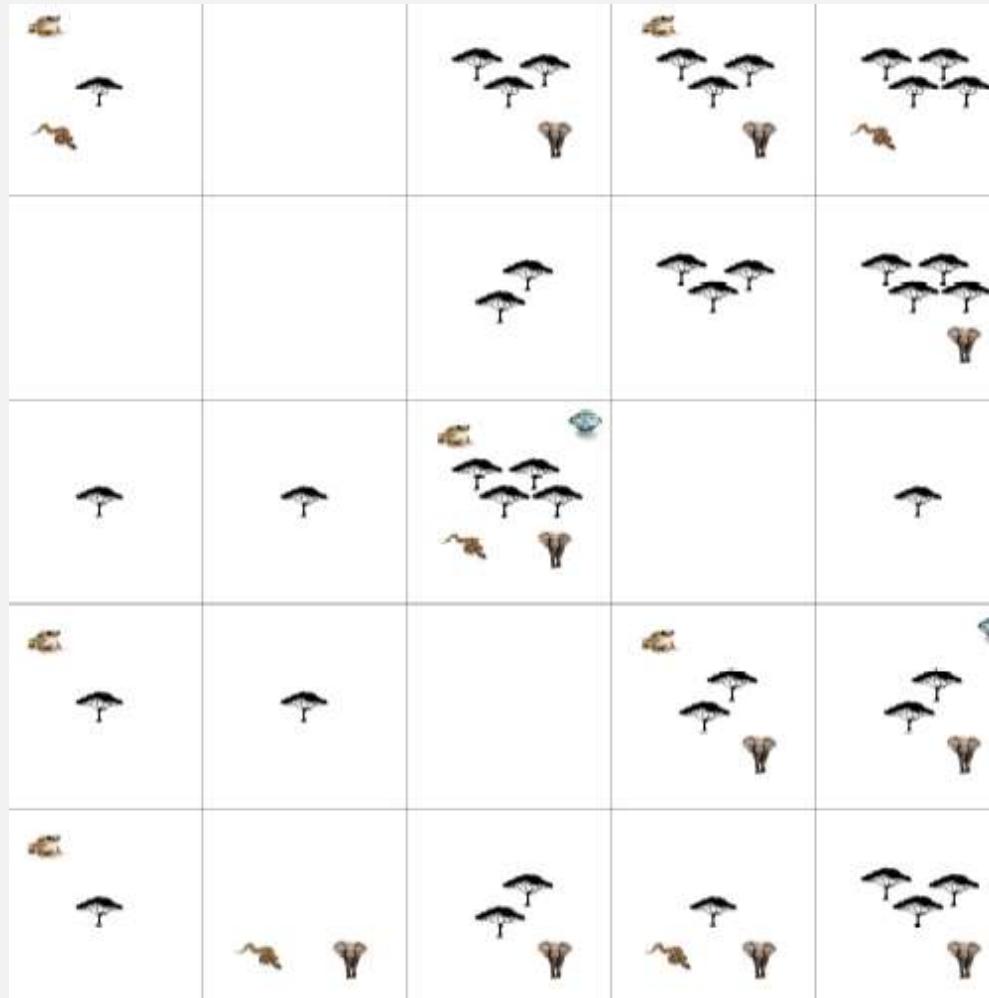


- Which unit should a decision maker pick?
- Country target is to preserve at least 50% of rana arlequin
- Limited resources

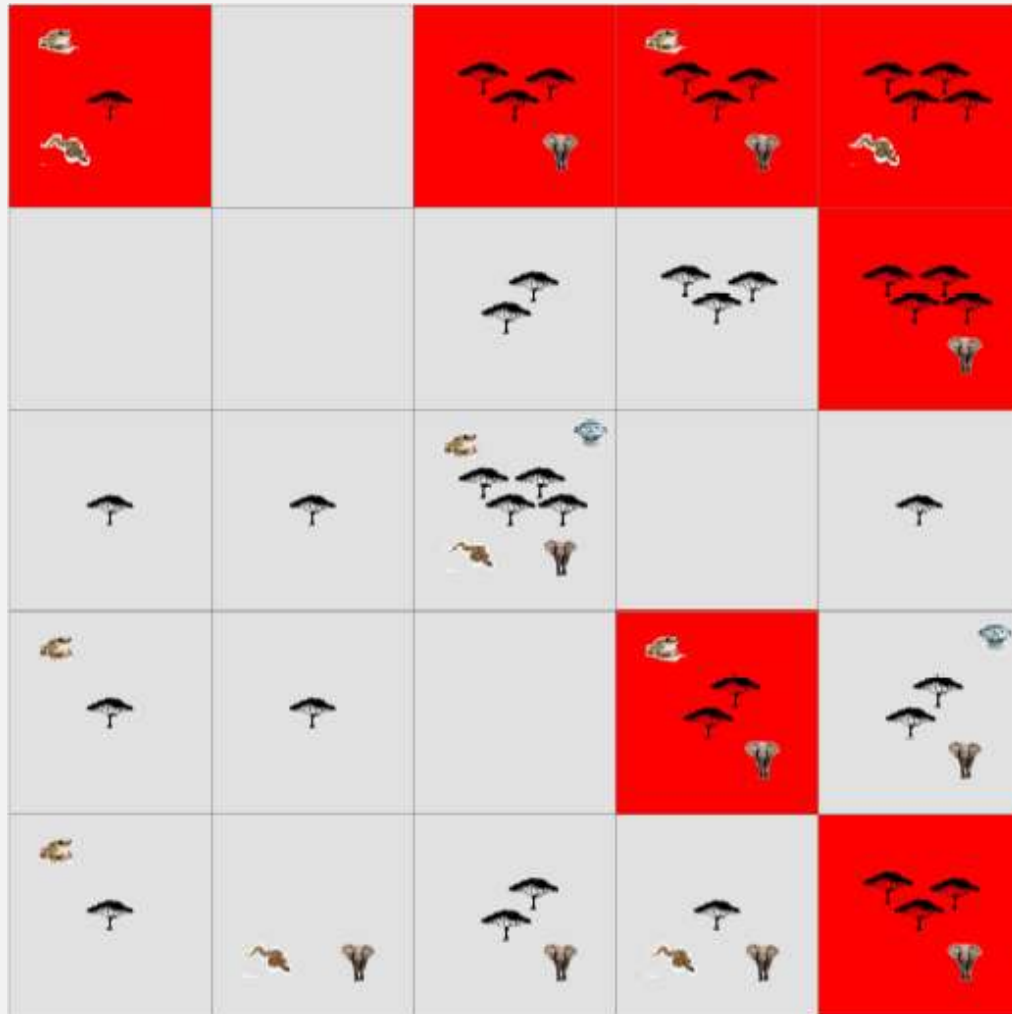
How Marxan works for conservation planning

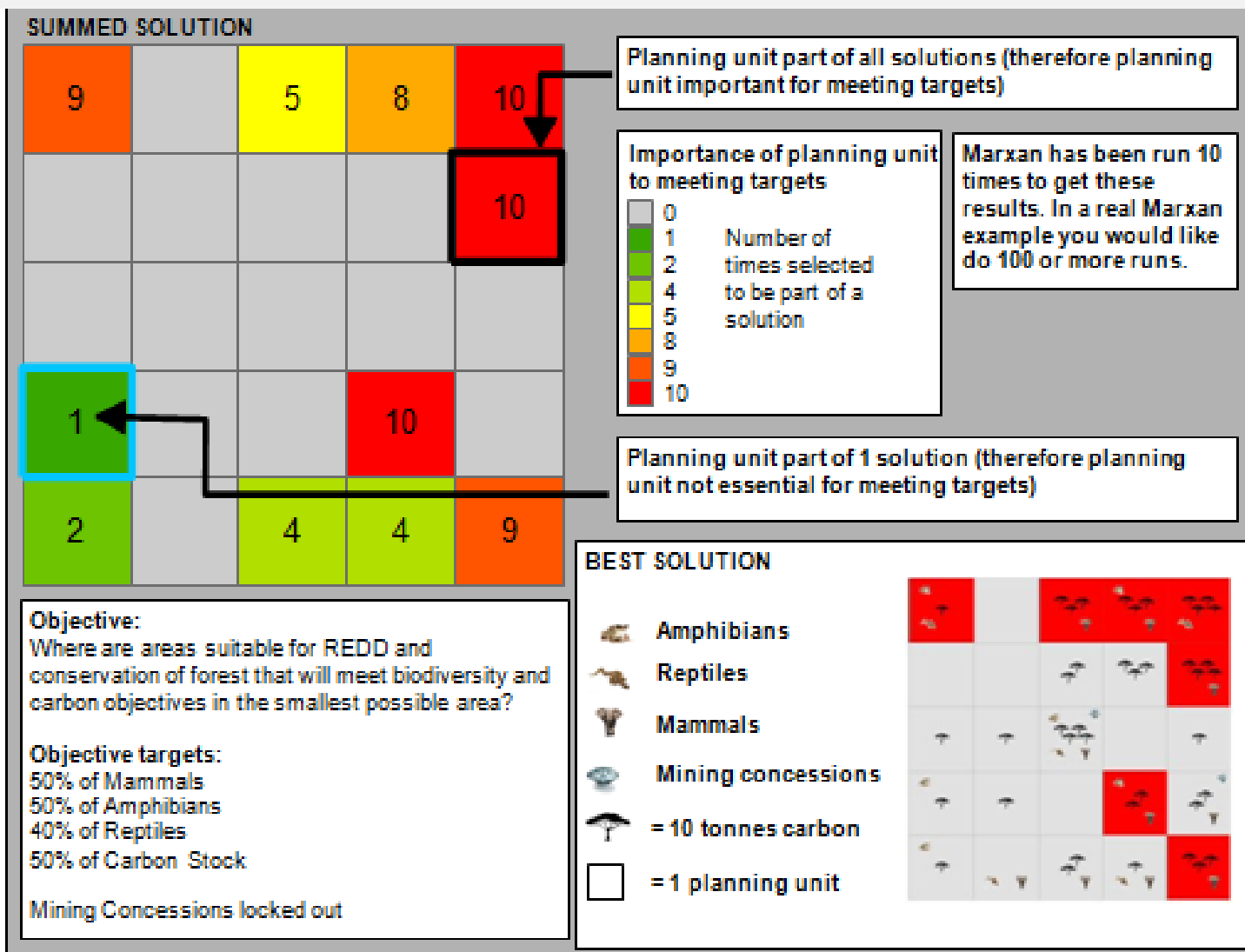


How does Marxan work?

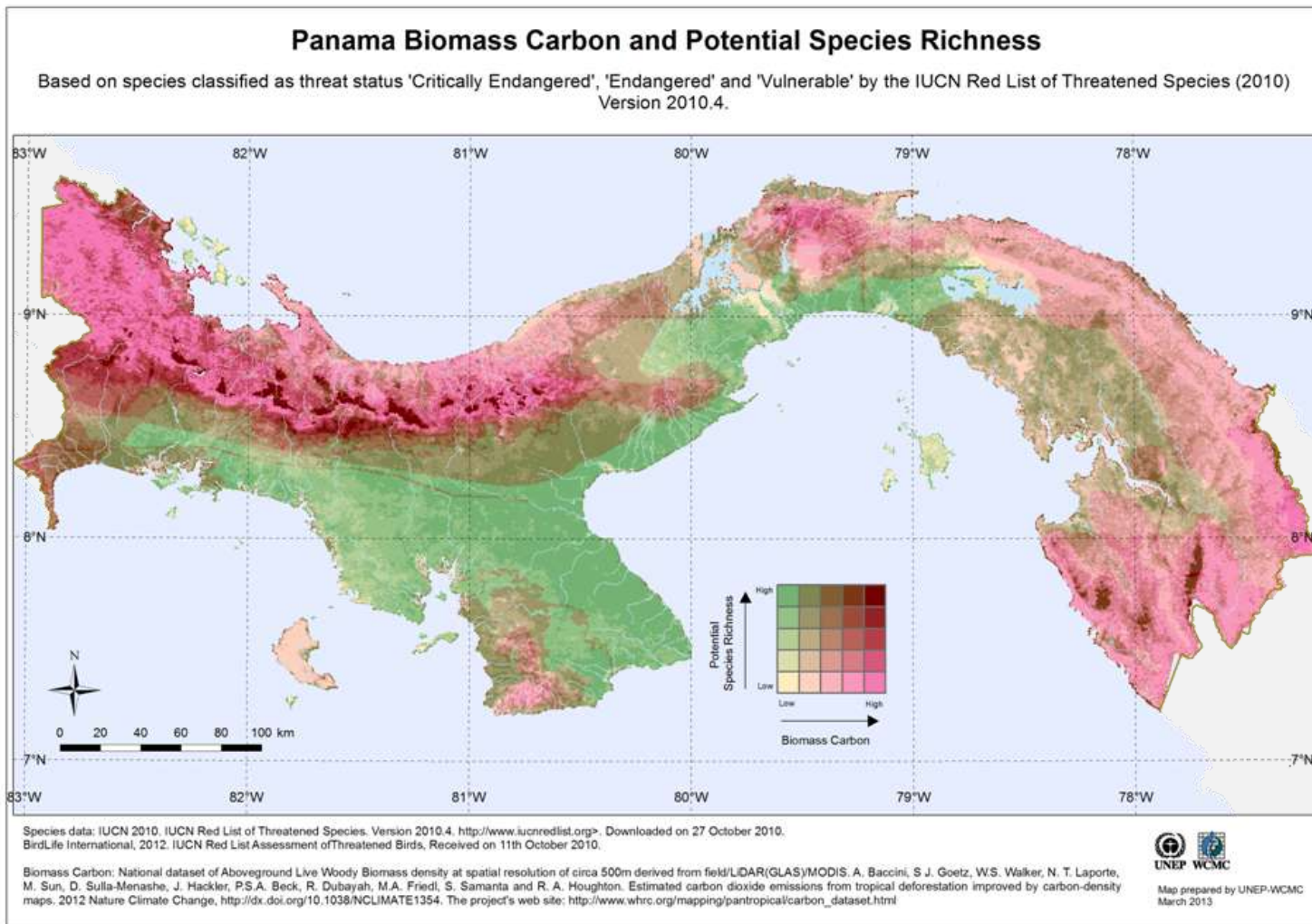


How does Marxan work?





How does Marxan work?



Considerations when running Marxan

However - Marxan and other land-use planning exercises require:

- Multiple quantitative targets that may cover:
 - Carbon
 - Biodiversity
 - Ecosystem services



Considerations when running Marxan

However - Marxan and other land-use planning exercises require:

- Multiple quantitative targets
- A multi-stakeholder group to be consulted



Considerations when running Marxan

However - Marxan and other land-use planning exercises require:

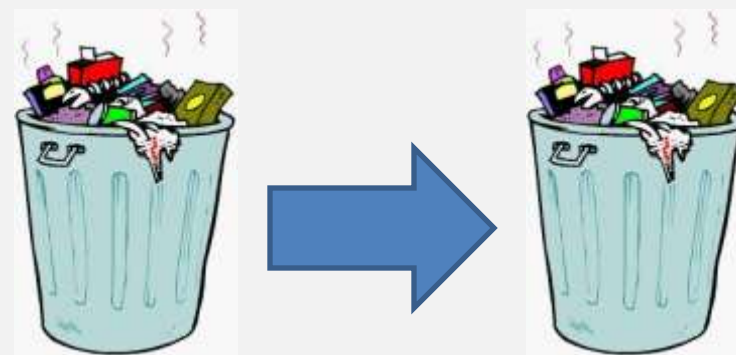
- Multiple quantitative targets
- A multi-stakeholder group to be consulted
- Time and resources

January	February	March
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4	1 2 3 4 5 6 7 8 9
8 9 10 11 12 13 14	5 6 7 8 9 10 11	10 11 12 13 14 15 16
15 16 17 18 19 20 21	12 13 14 15 16 17 18	17 18 19 20 21 22 23
22 23 24 25 26 27 28	19 20 21 22 23 24 25	24 25 26 27 28 29 30
29 30 31	26 27 28 29 30	
April	May	June
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4	1 2 3 4 5 6 7 8 9
8 9 10 11 12 13 14	5 6 7 8 9 10 11	10 11 12 13 14 15 16
15 16 17 18 19 20 21	12 13 14 15 16 17 18	17 18 19 20 21 22 23
22 23 24 25 26 27 28	19 20 21 22 23 24 25	24 25 26 27 28 29 30
29 30 31	26 27 28 29 30	
July	August	September
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4	1 2 3 4 5 6 7 8 9
8 9 10 11 12 13 14	5 6 7 8 9 10 11	10 11 12 13 14 15 16
15 16 17 18 19 20 21	12 13 14 15 16 17 18	17 18 19 20 21 22 23
22 23 24 25 26 27 28	19 20 21 22 23 24 25	24 25 26 27 28 29 30
29 30 31	26 27 28 29 30	
October	November	December
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4	1 2 3 4 5 6 7 8 9
8 9 10 11 12 13 14	5 6 7 8 9 10 11	10 11 12 13 14 15 16
15 16 17 18 19 20 21	12 13 14 15 16 17 18	17 18 19 20 21 22 23
22 23 24 25 26 27 28	19 20 21 22 23 24 25	24 25 26 27 28 29 30
29 30 31	26 27 28 29 30	



However - Marxan and other land-use planning exercises require:

- Multiple quantitative targets
- A multi-stakeholder group to be consulted
- Time and resources
- Good datasets



- Multiple benefits from REDD+ are unevenly distributed in space, spatial planning can support capturing multiple benefits
- Tools are available to support spatial planning for REDD+
- UNEP-WCMC is demonstrating how the Marxan tool can be used for REDD+
- Sometimes the best part of using the tool is getting the right people to engage at the right time in REDD+ planning



Find out more about Marxan:

<http://www.uq.edu.au/marxan/>

Find out more about UN-REDD:

<http://www.un-redd.org/>

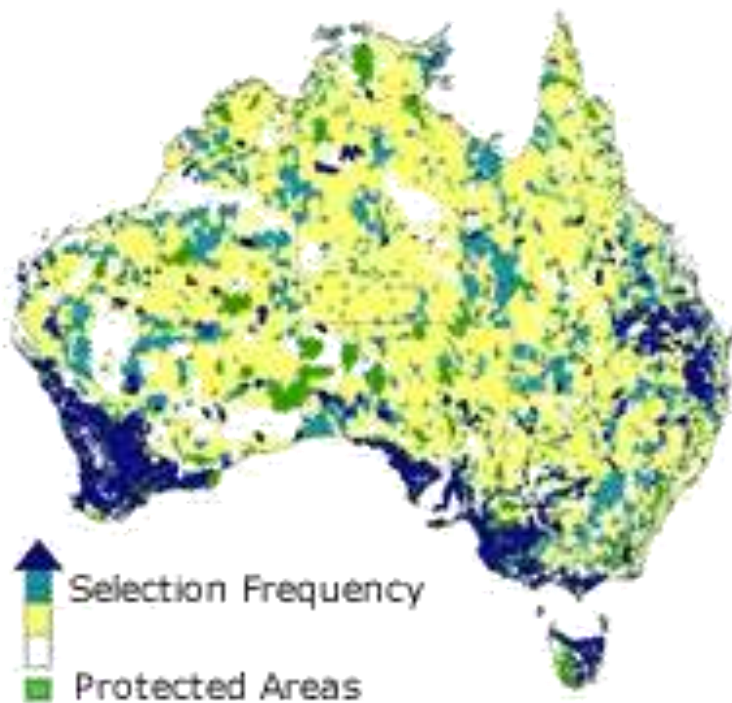
Find out more about UNEP-WCMC:

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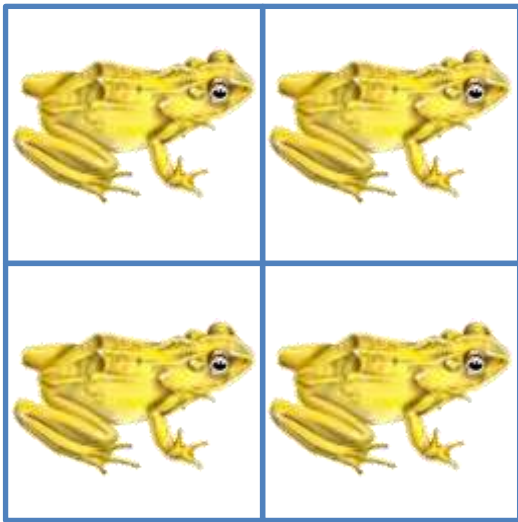


Decision support tools for conservation

<http://www.uq.edu.au/marxan>

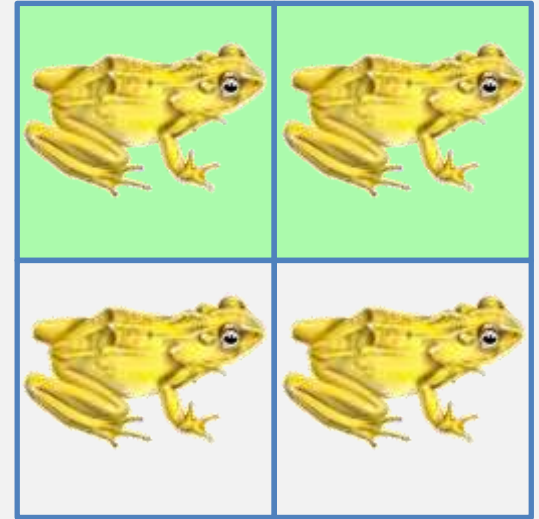
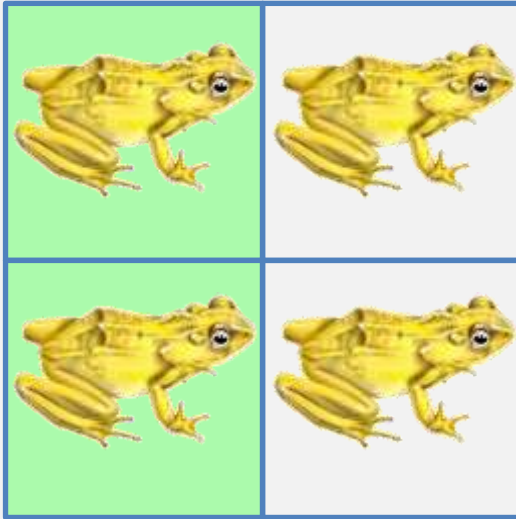


How Marxan works for conservation planning



- Here a policy maker may wish to preserve 50% of rana arlequín

Software will not add value here



How Marxan works for conservation planning











- Which area should a decision maker choose to protect

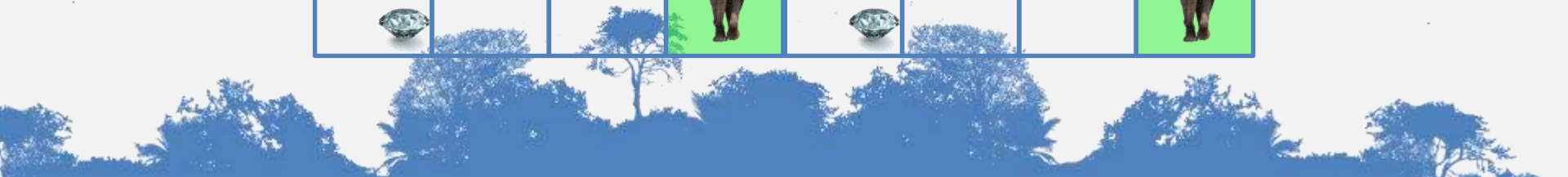
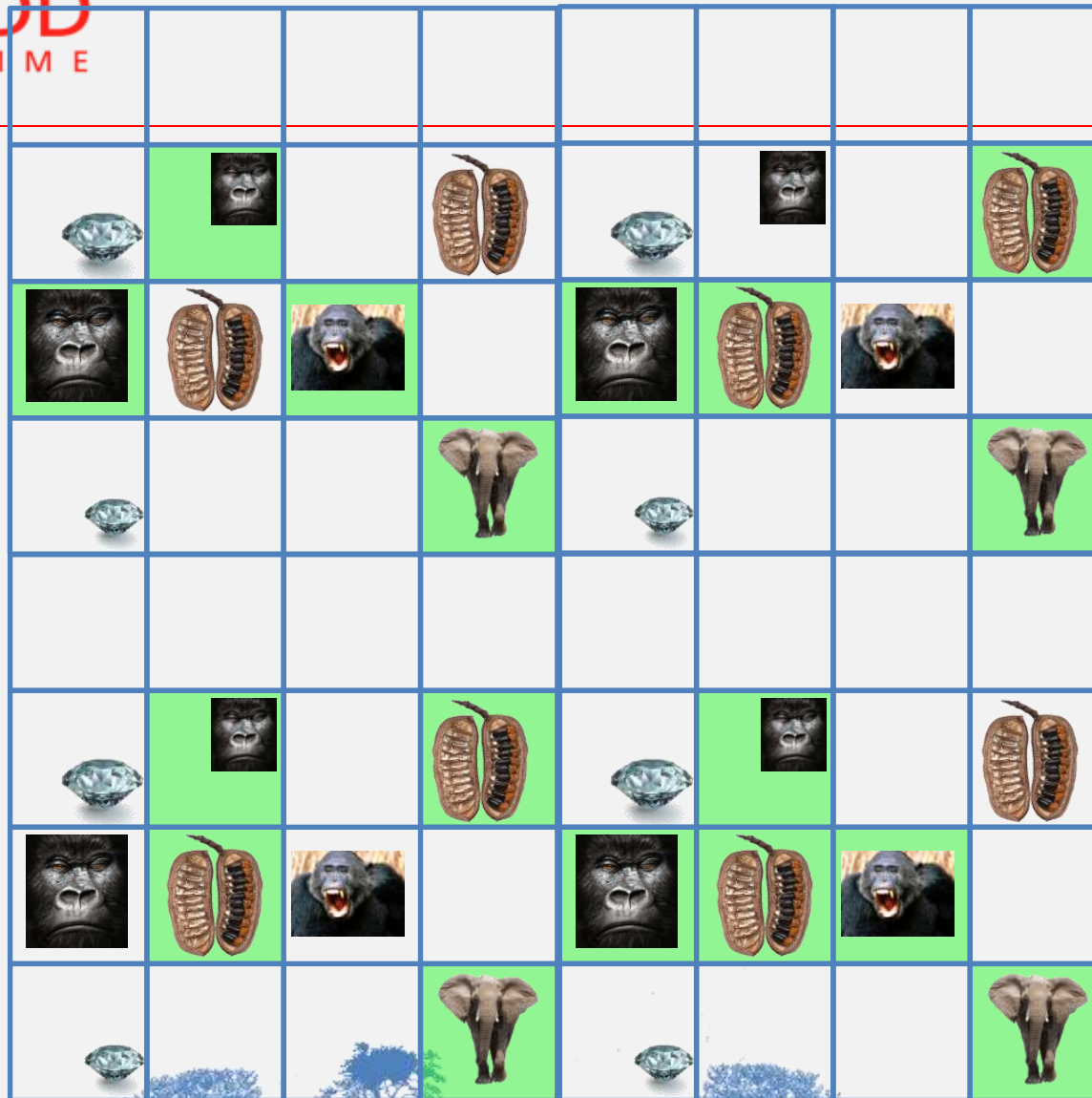
How Marxan works for conservation planning



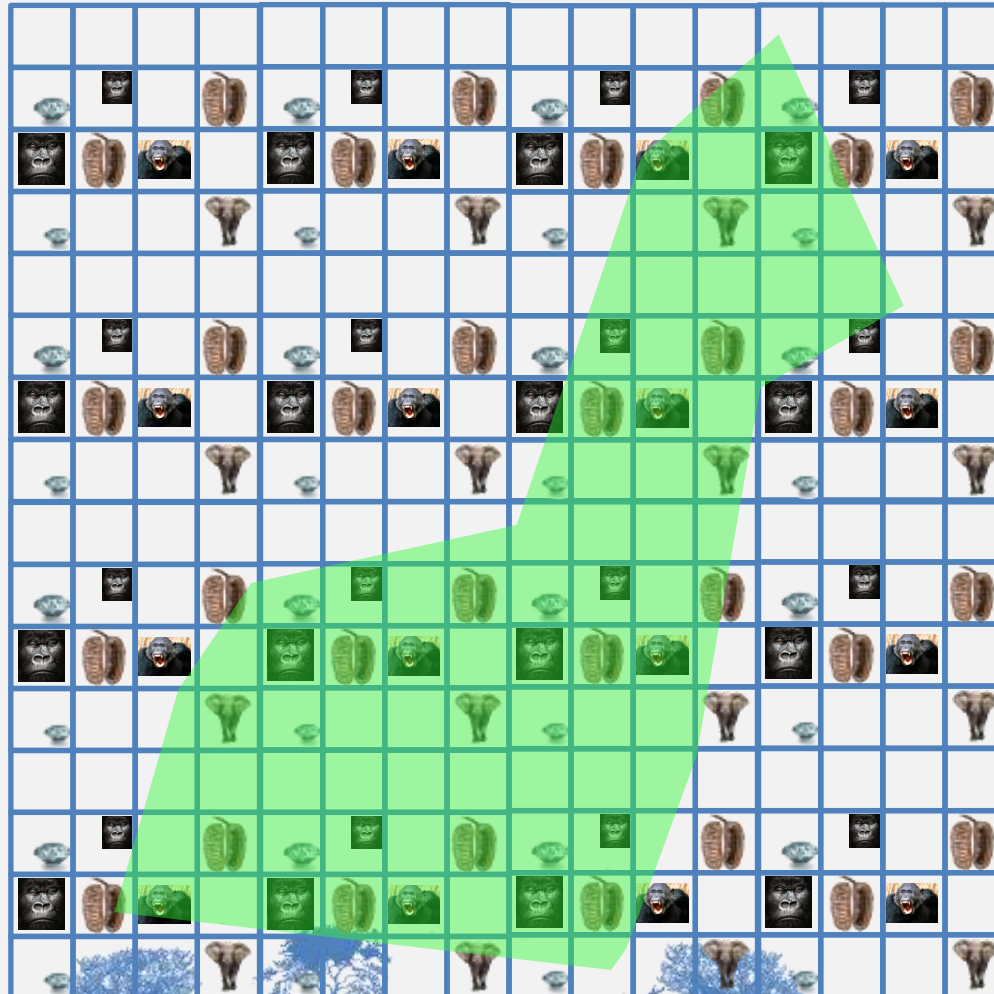


UN-REDD PROGRAMME



Software will add value here where
decision making is complex





How does Marxan choose?

- Produces hundreds of solutions
- Picks the best compromise answer at the lowest cost based on what your objectives are
- Stakeholder involvement is fundamental to setting appropriate objectives



Outline

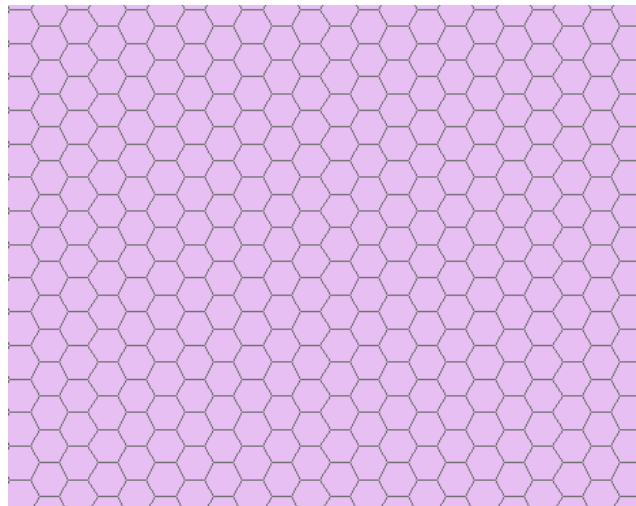
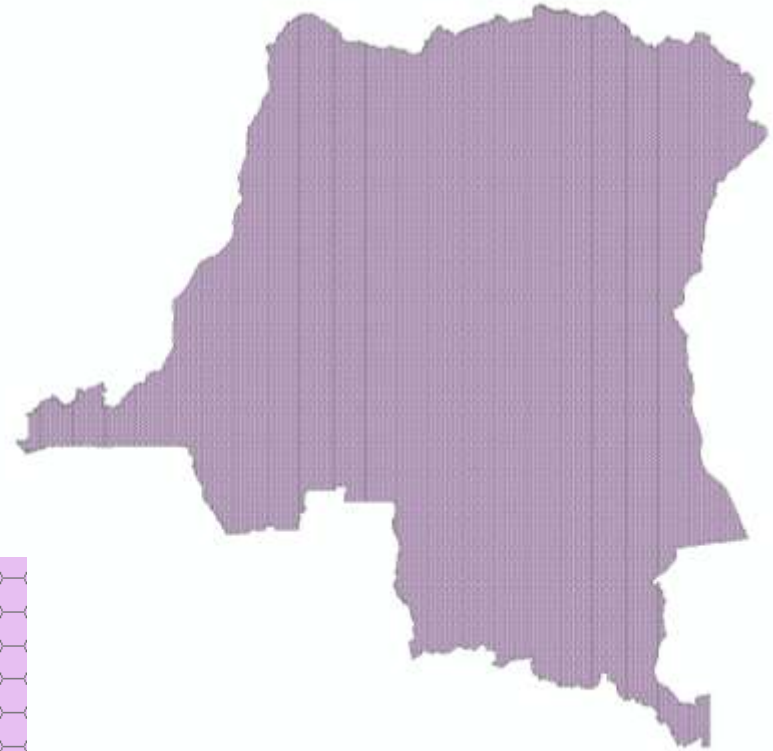
- The challenge faced by REDD+ countries
- Lessons learned from other disciplines
- Simplifying the challenge - Marxan for REDD+
- **Key Marxan concepts and limitations**
- Next steps



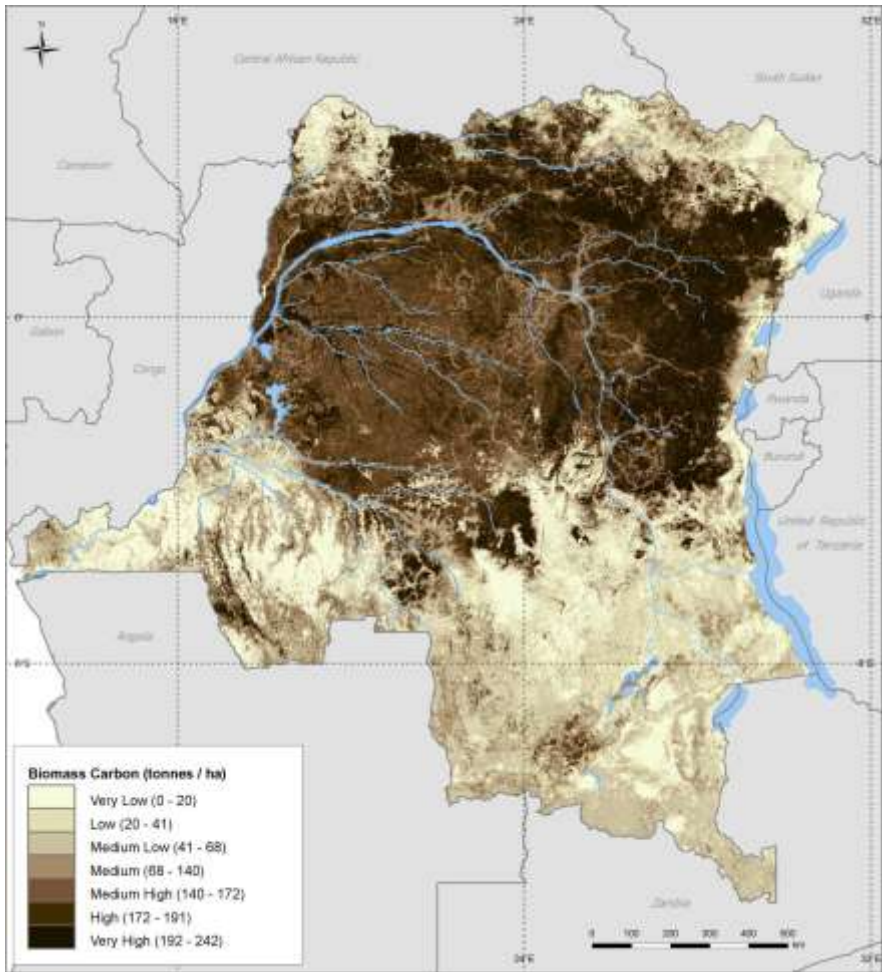
Key Marxan concepts

- Planning Units
- Targets
- Locking in and out
- Cost layer
- Best solution and summed solution
- Simulated annealing

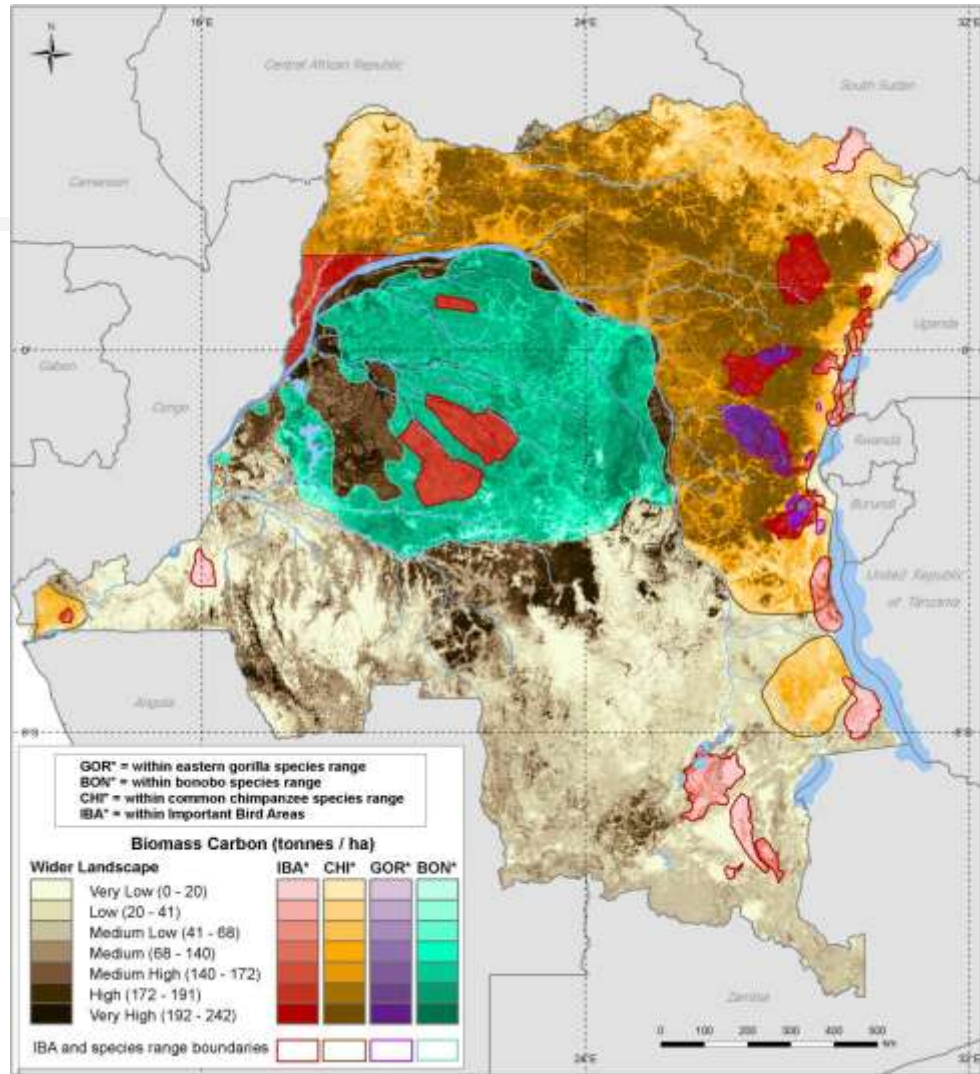
Planning units




Targets (objectives)



- Have to be proportions of user defined spatial data layers
- 20% carbon stocks (5Gt)
 - 50% great ape ranges





Example question and related objectives

- Identify all forest that could be retained under RED, meeting the multiple objectives set – based on national target figure for RED:

Objectives:

X% carbon from forest

X% classified forests (CODE FORESTIER)

X% representative habitat types

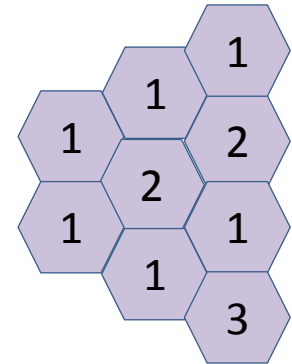
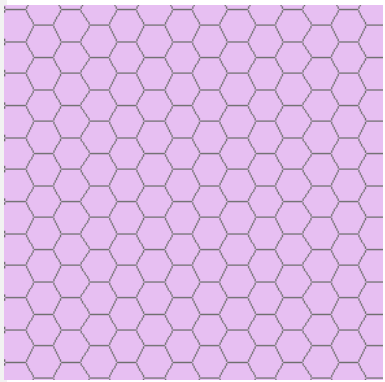
X% key species ranges

Locking in and out

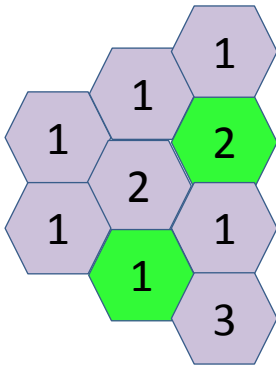


- Locking in protected areas to REDD priority zones
- Locking out mines from the REDD+ priority zones


Cost layer



Cost layer



- The cost of this solution would be 3



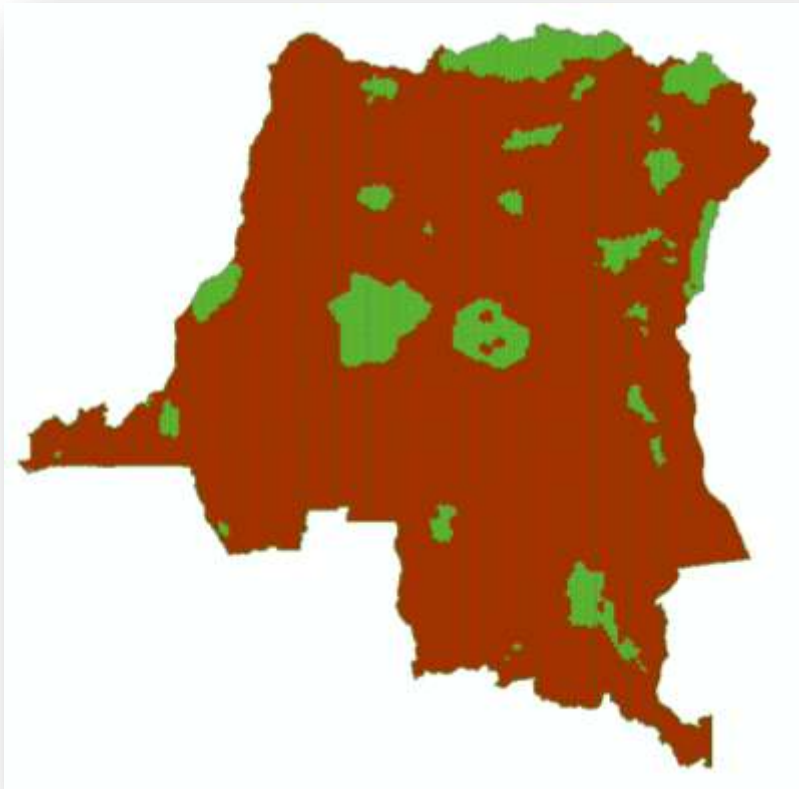
What number should you give a planning unit to represent cost?

- What do you want to minimise in your output?
 - Area
 - Opportunity cost
 - Implementation cost
 - Something else?

How does Marxan reach compromise?

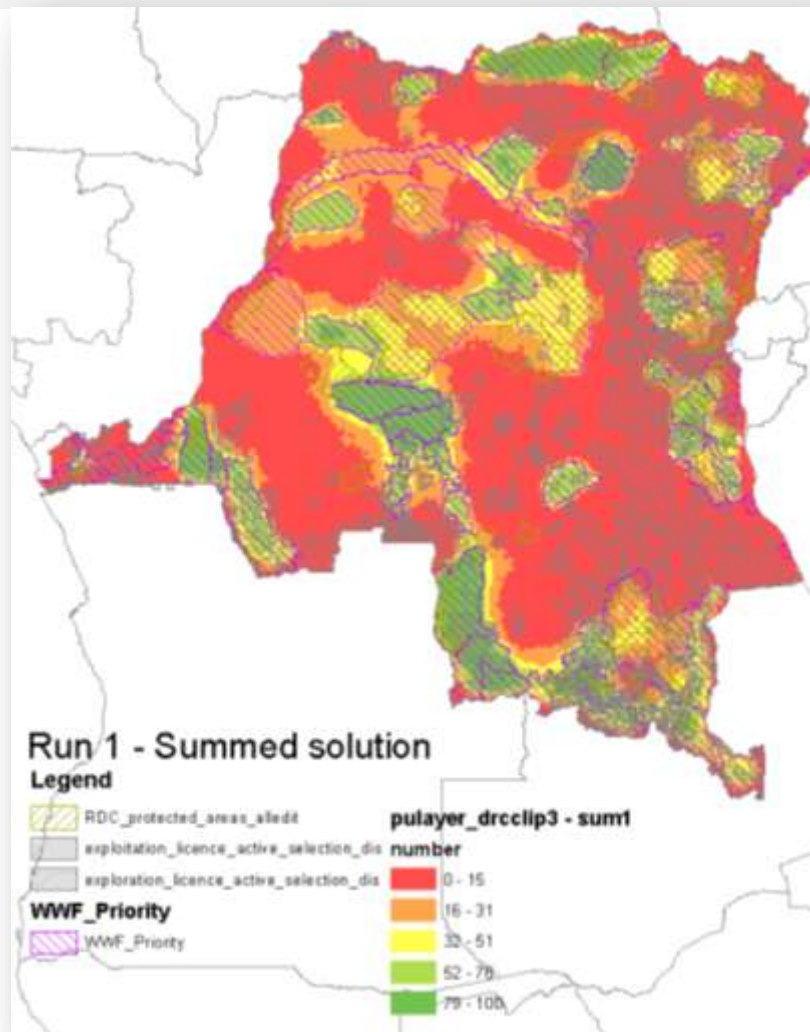


Best solution



100,000 "USD"

Summed solution





How does it find solutions? Simulated annealing

- Algorithm - simulated annealing
 - Starts by selecting a set number of planning units
 - Adds/removes subsection planning units at random
 - Preserves/discards planning units based on cost and objectives
 - Thousands of times -> solution



Limitations

- Solution is as strong as the data available
- Can't deal with all 5 REDD+ activities at once
- Development objectives can only be considered through locking in and out
- Preparation of input files requires GIS expertise



Next steps

- Make the illustration nationally relevant
- Report on results
- Capacity building on tool
- Support on using tool