

Exercise on systematic conservation planning tools

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*Empowered lives.
Resilient nations.*



An aerial photograph of a river network, where the main channels are colored in a vibrant purple and the surrounding floodplains and tributaries are in various shades of green. The pattern is intricate and branching, resembling a tree or a web.

How can we identify or prioritise the best places for action?

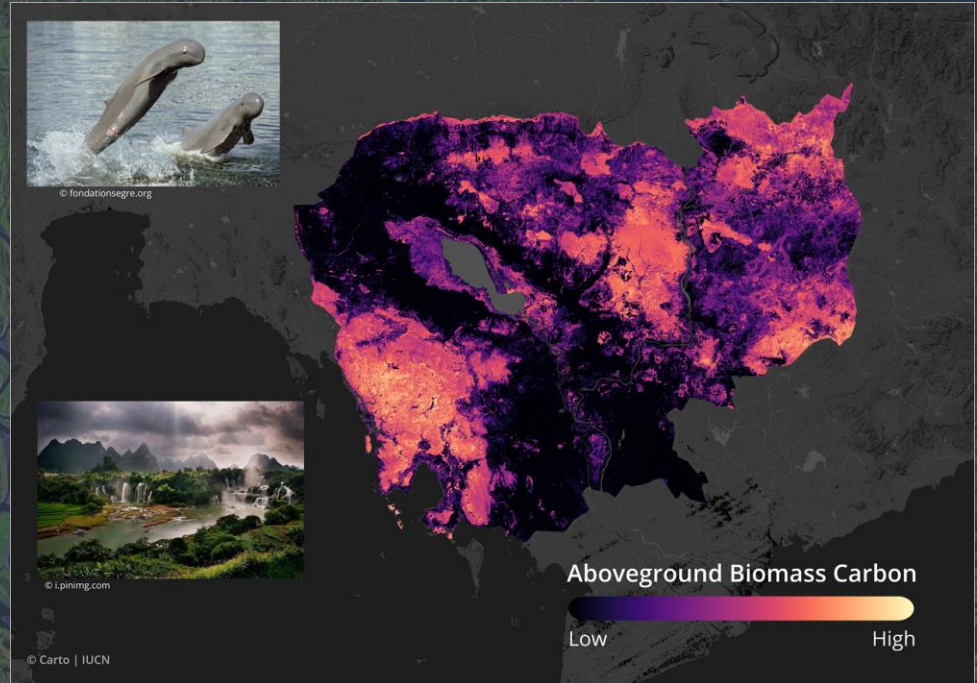
(and what does 'best' even mean?!)

Values

- What is important to us?
 - Environment?
 - Resources?
 - Cultural heritage?

Decisions

- What are our targets?
- What are our constraints?
- Financially, Politically, Socially?



Time for some jargon...

- **Target:** think about conserving or restoring a percentage of *Cinclodes aricomae* habitat (quantify it - a real number)
- **Planning Unit (PU):** units of land (or sea!) on which actions can be taken (parcels of land, watersheds, user-defined grids ,coral reefs.)
- **Boundary Length Modifier (BLM):** the compactness of a reserve system (values greater than 0 result in more complex reserves).
- **Species Penalty Factor (SPF):** the impact of not reaching a target in the scenario.

Basic Scoring of a Scenario:

Total Score of the Scenario Being Tested =

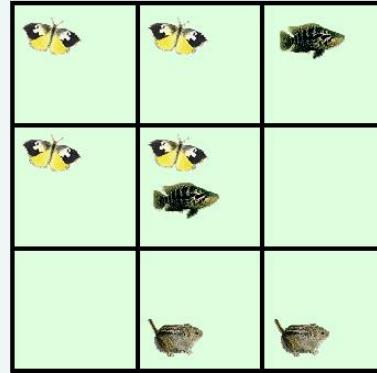
Cost (of PU)

+

(BLM * Boundary Length of the Reserve System)

+

(SPF * Penalty Incurred for Unmet Targets)



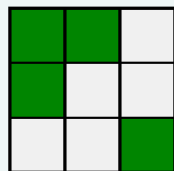
Each planning unit costs 1

Boundary length modifier value = 1.5.

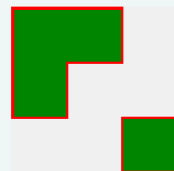
The species penalty factor for all three species is 10.

Illustrations by Bob Smith (DICE)

Measuring overall score



Total PU
cost = 4



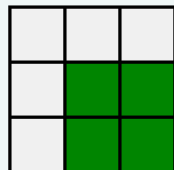
Boundary =
 $12 * 1.5$



SPF = 10

Total
score

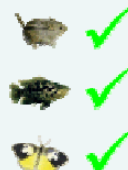
32



Total PU
cost = 4



Boundary =
 $8 * 1.5$



SPF = 0

16

Illustrations by Bob Smith (DICE)

An aerial photograph of a river network on a green landscape. The rivers are dark blue and purple, winding through the green terrain. The text is overlaid on the image.

Now a game...!

Can you design the most efficient
system of protected areas?

Instructions

Click on the squares below to select or deselect a square. The goal is to select squares that total to meet the target values with lowest possible cost. When you meet your targets you can compare your results against Marxan's results.

0	0	0	0	0	0	0	0	1	0	0	0	89	0	12	30	48	0	69	4	9	0	0	0	0	0	0	0	0	0	0	91
\$347	0	0	0	\$52	0	0	\$985	\$207	0	\$276	0	\$821	\$122	\$404	\$300	\$681	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	\$537	0	0	\$931	\$653	0	\$71	43	99	0	0	0	17	0	0	0	0	0	0	0	0	0	0	35	31	0	0	
0	0	0	55	40	0	0	0	0	2	27	70	0	0	0	37	0	56	0	0	0	0	0	33	0	41	0	54	0	0	0	
\$247	0	0	\$462	\$287	\$988	\$85	\$736	\$681	\$479	\$459	\$615	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	80	8	0	0	47	0	0	0	0	78	0	0	0	87	66	0	38	0	0	0	0	0	0	0	0	0	0	91	0
\$378	\$986	\$887	\$392	\$526	\$783	\$224	\$149	\$268	\$90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	
0	0	0	0	\$74	0	73	0	60	0	25	79	0	0	0	11	0	8	0	0	0	0	0	0	0	0	0	0	0	0	58	
\$977	0	0	0	\$53	\$390	\$619	\$773	\$952	\$738	\$897	\$580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	
76	34	0	0	90	0	84	0	0	0	82	0	72	26	0	0	0	0	0	21	58	0	0	0	0	0	0	0	0	54	59	
\$969	\$76	\$147	\$870	\$350	\$543	\$607	\$375	\$903	\$790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
75	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	91	0	0	0	0	0	57	0	42	97	0	0	0	0	7	
\$729	\$492	\$303	\$289	\$490	\$599	\$407	\$651	\$709	\$365	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	
0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
\$571	\$931	\$353	\$64	\$955	\$950	\$855	\$886	\$840	\$598	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	12	0	0	0	0	0	53	24	0	72	0	93	0	0	0	0	0	0	0	23	59	0	0	0	0	0	0	0	0	
\$422	\$252	\$941	\$152	\$353	\$123	\$716	\$587	\$346	\$318	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	11	0	0	14	50	0	0	0	0	88	0	0	0	0	0	0	0	48	0	0	0	0	0	0	0	0	0	76	0
\$682	\$891	\$815	\$818	\$726	\$372	\$197	\$89	\$417	\$975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Features	Target	Current	Shortfall	Cost:	
A	267.4	0	267.4	Boundary:	+ 0
B	251.2	0	251.2	Shortfall Penalty:	+ 761.6
C	243.0	0	243	Your Marxan Score:	= 761.6

Marxan Results:

Once you meet your targets Marxan's results will appear here.

This exercise is produced here with the permission and support of:



THE UNIVERSITY OF QUEENSLAND
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<https://aproposinfosystems.com/en/solutions/marxan-demo/>

Comments or Questions?

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