Chapter 8 – Conservation planning

QUESTIONS ASKED

- How do we express the suitability of habitat for different organisms and communities?
- How to make spatial planning of conservation networks that takes into account multiple ecological and social criteria?
- How to perform an economic analysis of the non-monetized conservation effects?

BACKGROUND INFORMATION

- Compendium: Santos (2015b)
- Wikipedia: Reserve design, Marine Protected Area
- YouTube: CSIRO, Multiple criteria decision making

COVERAGE

- Habitat suitability indices
- Optimization of area utilization in socio-ecological networks; minimum area and minimum conflict networks
- Multiple criteria decision making
- Cost-effectiveness analysis

INSPIRATION AND SOFTWARE

In 1990, Millsap et al performed a spatial analysis of the vulnerability of several taxa in Florida using very simple means. Even today, this is still a work of reference. In 2003, Williams *et al* developed this method, including socio-economic constraints and numerical optimization methods, and applied it to the enormous Guinean-Congolian forest. The present exercise, in its student version, requires manual optimization of the network, but facilitates the computation of suitability totals and costs.

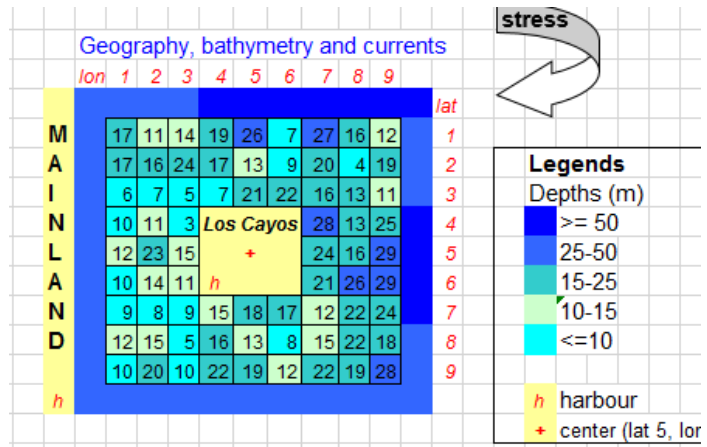- Ch8 Conservation Los Cayos Reserve short version JdS.xlsx

SNAPSHOTS

Cayos Cochinos
Honduras

Bienvenido!

Abouid (2007)

Visit Cayos Cochinos!

Claros

Geography, bathymetry and currents

stress

lon	1	2	3	4	5	6	7	8	9		lat
M A I N L A N D	17	11	14	19	26	7	27	16	12		1
	17	16	24	17	13	9	20	4	19		2
	6	7	5	7	21	22	16	13	11		3
	10	11	3	Los Cayos		28	13	25			4
	12	23	15	+			24	16	29		5
	10	14	11	h			21	26	29		6
	9	8	9	15	18	17	12	22	24		7
	12	15	5	16	13	8	15	22	18		8
	10	20	10	22	19	12	22	19	28		9
h											

Legends
Depths (m)
- >= 50
- 25-50
- 15-25
- 10-15
- <=10

h harbour
+ center (lat 5, lon

September

Good news. The government was very favourable to your proposal for monitoring funds but only allocated $1180 for that purpose.
Re-design reserve, maximising protection for those monitoring costs

Mark the desired squares with a 1 for conservation

lat	long 1	2	3	4	5	6	7	8	9
M A I N L A N D	1								
	2								
	3			1					
	4			+					
	5								
	6		h						
	7								
	8								
	9								
h									

Input
Score in marked areas

Output (automatic, re-
Squares marked for c
Costs
  Intra-square distan
  Distances to center
  Total (1 distance=1

Cost pr square
Cost pr score

Aquaimages