A Regulation-Based Classification System for Marine Protected Areas (MPAs)

Classification System of Zones within MPAs (a decision tree)

How many types of fishing gear? — 0   1-5   6-10   11-15   16-20   >20

What is the impact of fishing gear? (highest gear score) *
0   ≤5   6-8   9   ≤8   9

What is the impact of other activities? (aquaculture or bottom exploitation index) **
0   1   2   ≤1   2   ≤1   2   ≤1   2

Anchoring and/or boating? (anchoring/boating index) ***
0   1   2

ZONE Class: 1   2   3   4   6   4   6   5   6   6   5   6   6   6   7   8
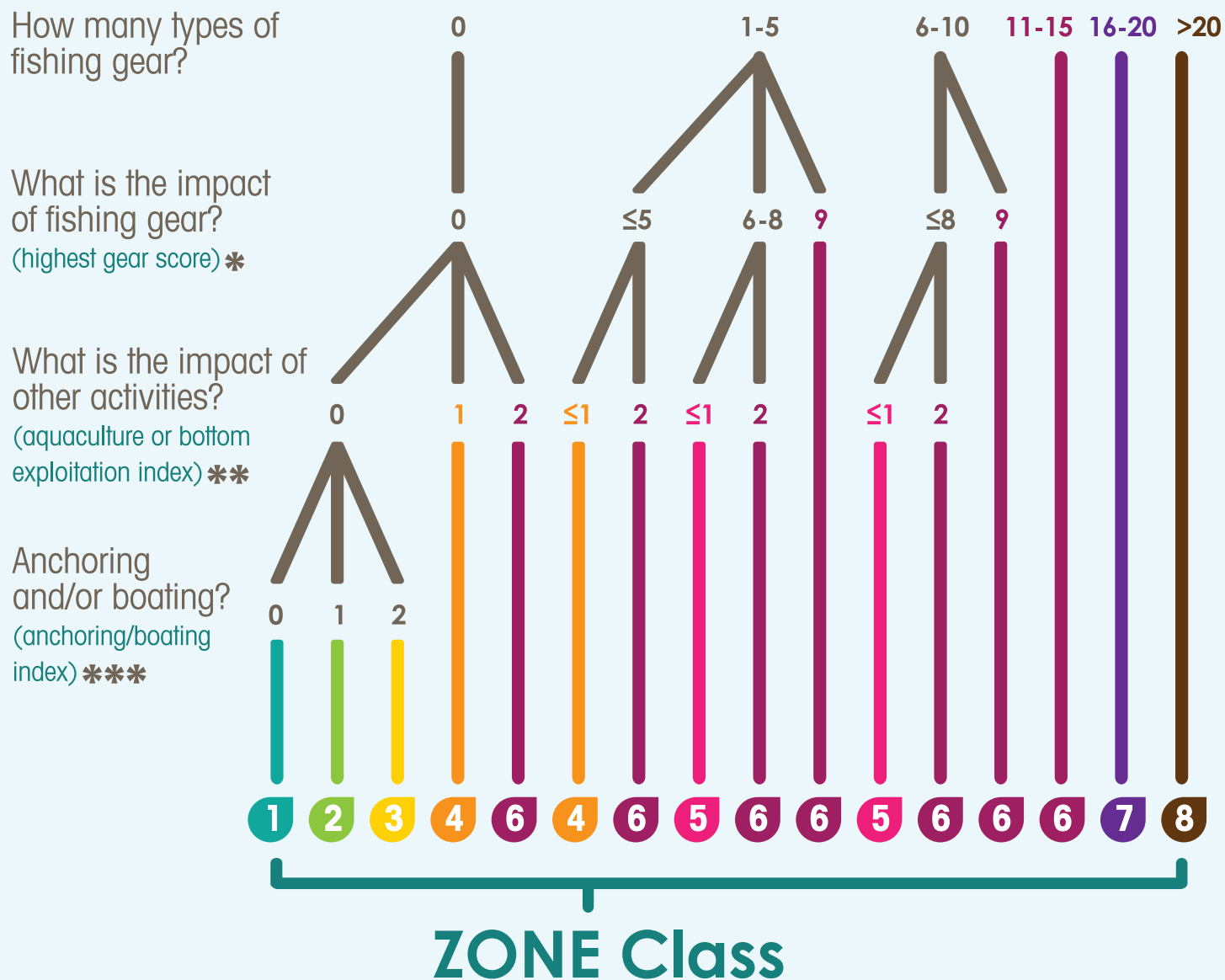
ZONE Classification

1 No-take/No-go

2 No-take/Regulated access

3 No-take/Unregulated access

4 Highly regulated extraction

5 Moderately regulated extraction

6 Weakly regulated extraction

7 Very weakly regulated extraction

8 Unregulated extraction

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Classification System of MPAs

ZONE Class **1** **2** **3** **4** **6** **4** **6** **5** **6** **6** **5** **6** **6** **6** **7** **8**
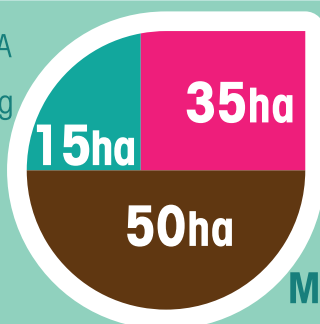
Next stage: how to classify MPAs

An MPA index is calculated based on the area each ZONE Class occupies within the MPA

$$\text{MPA index} = \text{SUM} \left(\text{ZONEi Class} \times \frac{\text{Area ZONEi}}{\text{Area MPA}} \right)$$

Example of a multiple-use MPA with 3 zones (and corresponding zone classes) occupying different areas

15ha
35ha
50ha

EXAMPLE
MPA with 100 ha of total area
15ha class 1 + 35ha class 5 + 50ha class 8

$$\text{MPA index} = \left(1 \times \frac{15}{100}\right) + \left(5 \times \frac{35}{100}\right) + \left(8 \times \frac{50}{100}\right) = 5.9$$

MPA index   MPA Classification

1 to 3 *incl.*   **FULLY PROTECTED AREA**

3 to 5 *incl.*   **HIGHLY PROTECTED AREA**

5 to 6 *incl.*   **MODERATELY PROTECTED AREA**

6 to 7 *incl.*   **POORLY PROTECTED AREA**

7 to 8   **UNPROTECTED AREA**

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Indices of Activities (supporting information for the decision tree)

*Highest fishing gear score

Fishing gear (commercial or recreational)	Gear score
Beach seines	8
Cast nets	3
Dredges (bivalves)	7
Drift nets	5
Fish traps	6
Fixed fish traps "madrague"	6
Gillnets	6
Hand dredges (bivalves)	5
Hand harvesting	4
Intertidal hand captures	3
Lines (jigs, hook and line, rod, troll)	5
Longlines (bottom)	5
Longlines (pelagic)	4
Purse seining (bottom)	9
Purse seining (pelagic)	5
Spearfishing/diving	3
Surrounding nets near shore	8
Trammel nets	8
Traps (lobster/octopus/crab)	4
Trawl (bottom)	9
Trawl (pelagic)	5

≤ 5 corresponds to highly selective and low impact gears (e.g. lines, octopus traps);
6-8 medium impacting gears (e.g. fish traps, bottom longlines, pelagic towed gears);
9 to the most destructive gears affecting biodiversity and ecosystems (e.g. bottom trawling, bottom purse seining)

**Aquaculture or bottom exploitation index

Activities allowed	Index
Aquaculture and bottom exploitation not allowed	0
Aquaculture OR bottom exploitation allowed, but not mining/oil platforms/sand extraction/detonations	1
Both aquaculture AND bottom exploitation allowed with no restrictions (or if aquaculture is not allowed but mining/oil platforms/sand extraction/detonations are)	2

***Anchoring/boating index

Activities allowed	Index
No anchoring	0
Boating and/or anchoring allowed but anchoring is fully regulated: restricted to particular areas or mooring buoys	1
Boating and/or anchoring allowed but anchoring is only partially regulated or unregulated	2

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