

# Sufficiency, costs, effectiveness and efficiency of the Finnish PoMs

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- Oinonen, S., Hyytiäinen, K., Ahlvik, L., Laamanen, M., Lehtoranta, V., Salojärvi, J., Virtanen, J., 2016. Cost-Effective Marine Protection - A Pragmatic Approach. PLoS ONE 11, e0147085.
- Börger, T., Broszeit, S., Ahtiainen, H., Atkins, J.P., Burdon, D., Luisetti, T., Murillas, A., Oinonen, S., Paltriguera, L., Roberts, L., Uyarra, M.C., Austen, M.C., 2016. Assessing Costs and Benefits of Measures to Achieve Good Environmental Status in European Regional Seas: Challenges, Opportunities, and Lessons Learnt. Frontiers in Marine Science 3, 192.
- Nieminen, E., Ahtiainen, H., Lagerkvist, C.-J., Oinonen, S., 2019. The economic benefits of achieving Good Environmental Status in the Finnish marine waters of the Baltic Sea. Marine Policy 99, 181-189.

RESEARCH ARTICLE

# Cost-Effective Marine Protection - A Pragmatic Approach

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Table 5. Effectiveness of a candidate measure as a conditional probability distribution and the related scores.

Class	Description	Score
1	Measure has no impact	0
2	Measure bridges < 12.5% of the gap	0.063
3	Measure bridges 12.5–25% of the gap	0.188
7	Measure bridges 25–50% of the gap	0.375
5	Measure bridges 50–75% of the gap	0.625
6	Measure bridges 75–100% of the gap	0.875
7	Measure achieves GES by 2020	1.000

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Table 6. Costs of a candidate measure as a conditional probability distribution and related scores.

Class	Description	Score
1	0–0.1 M€	0.05
2	0.1–0.5 M€	0.3
3	0.5–1 M€	0.75
7	1–5 M€	3
5	5–10 M€	7.5
6	10–50 M€	30
7	>50 M€	50

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# Expert workshops

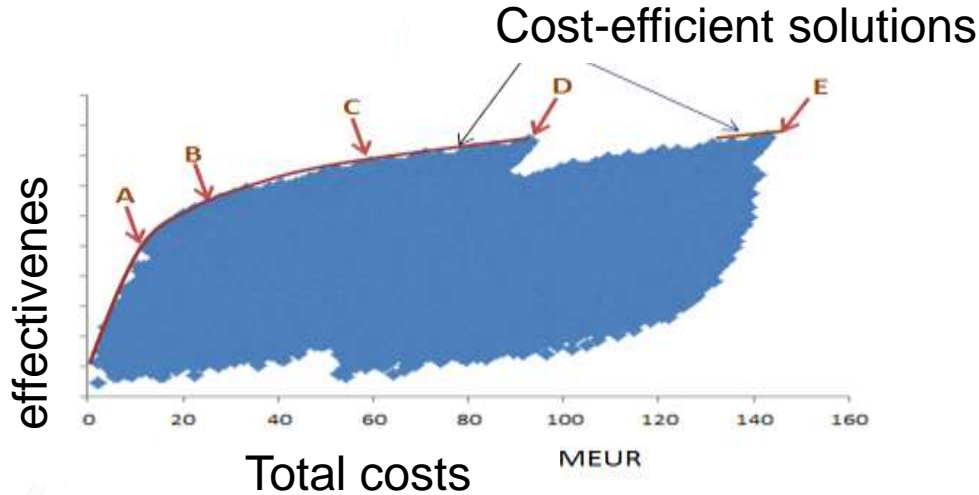
Workshop theme (date)	Number of experts	Number of assessed candidate measures
Eutrophication (18.9.2014)	13	6
Commercial fish stocks (19.9.2014)	6	7
Biodiversity (22.9.2014)	8	10
Marine traffic(2.10.2014)	4	4
Marine litter (6.10.2014)	7	8
Hydrography, underwater noise and toxic substances (7.10.2014)	6	6

1. Common understanding of the gap with respect to each of the GES descriptor
2. Common understanding of the content and cause-effect mechanism of the candidate measure
3. Assessment of the effectiveness of a candidate measure
4. Assessment of the costs of a candidate measure
5. Assessment of the difficulty of the cost and effectiveness assessment
6. Assessment of the joint effect of the candidate measures
7. Assessment of the cross-effect of the candidate measures

# Recipe for the cost-effectiveness analysis

- What is the objective ?
  - GES
- Where we are now?
  - Status assessment of the (Finnish) marine waters
- Size of the gap?
  - Now vs GES?
- Measures to bridge the gap?
- Effectiveness of the measures?
  - Theory of change?
- Costs of the measures?
- -> Least costs to bridge the gap between the present status and the GES

# Options for cost-efficient set of measures with different budgets



Budg.lim. M€	Number of measures (meas.includ.)	90% confidence interval for closing the gap				
		D1	D4	D5	D8	D9

D9=Contaminants in seafood

136,2

31 (all measures)

1.5 - 2.6

0.52 - 1.3

0.11 - 0.78

0 - 0.11

0 - 0.38