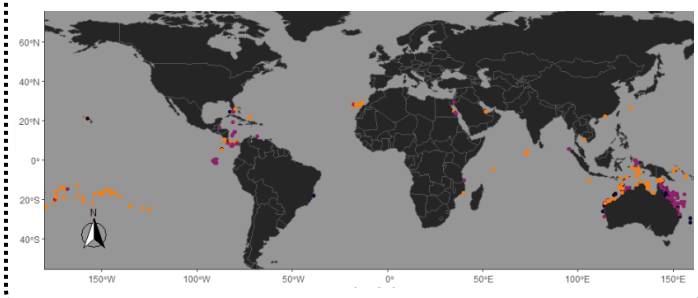
STEP 1

Occurrences & abundance data



Input Matrices

- Site-species Occurrence matrix
- Site-species Abundance matrix
- Site-species Biomass matrix
- Site-covariates matrix: *(Environment + Habitat + Socio-economy + Protection)*

STEP 2

Input

- Input matrices
- Protection status
- Site-covariates matrix

Spatial Linear Mixed Models

- ***N*** species-specific spatial logistic regressions
- ***N*** species-specific spatial Negative Binomial regressions
- ***N*** species-specific spatial Gaussian hurdle regressions

Output

- ***N*** responses to protection in Occurrence
- ***N*** responses to protection in Abundance
- ***N*** responses to protection in Biomass

STEP 3

Input

- Species responses *(Effect size of protection)*
- Species traits *(Trophic level, Maximum length, Rarity)*

Generalized Linear Models

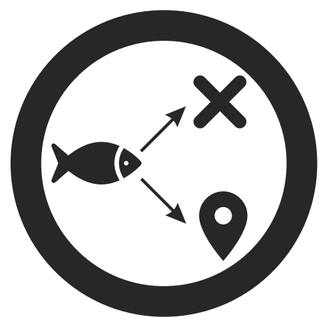
- 1 GLM for species responses in Occurrence
- 1 GLM for species response in Abundance
- 1 GLM for species response in Biomass

Output

- Influence of traits on species response

Low
Medium
High

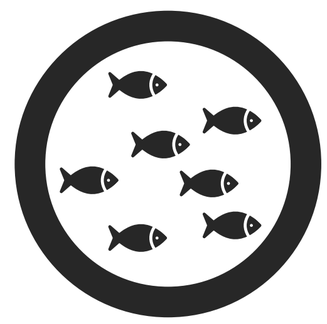
Occurrence



Protection status

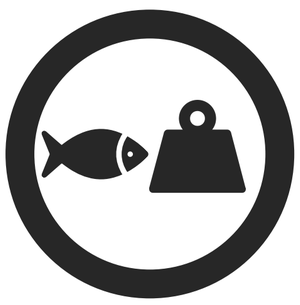
Low
Medium
High

Abundance



Low
Medium
High

Biomass



-1
0
1

Effect size of protection

Small

Medium

Large

Effect size of high protection

Abundance

Win

Lose

Rarity

Rare

Common

Very frequent

Biomass

Win

Lose

Trophic level

Small
Medium
Large
Effect size on occurrence of high protection
4
3
2
1
2.0
2.5
3.0
3.5
4.0
4.5
Trophic level
Win
Lose