

# Celtic Sea Ecological Sensitivity Analysis to inform future designation of Marine Protected Areas (MPAs)

A report by the Marine Protected Area Advisory Group for the Department of Housing,  
Local Government and Heritage  
June 2024

# MPA Advisory Group Team

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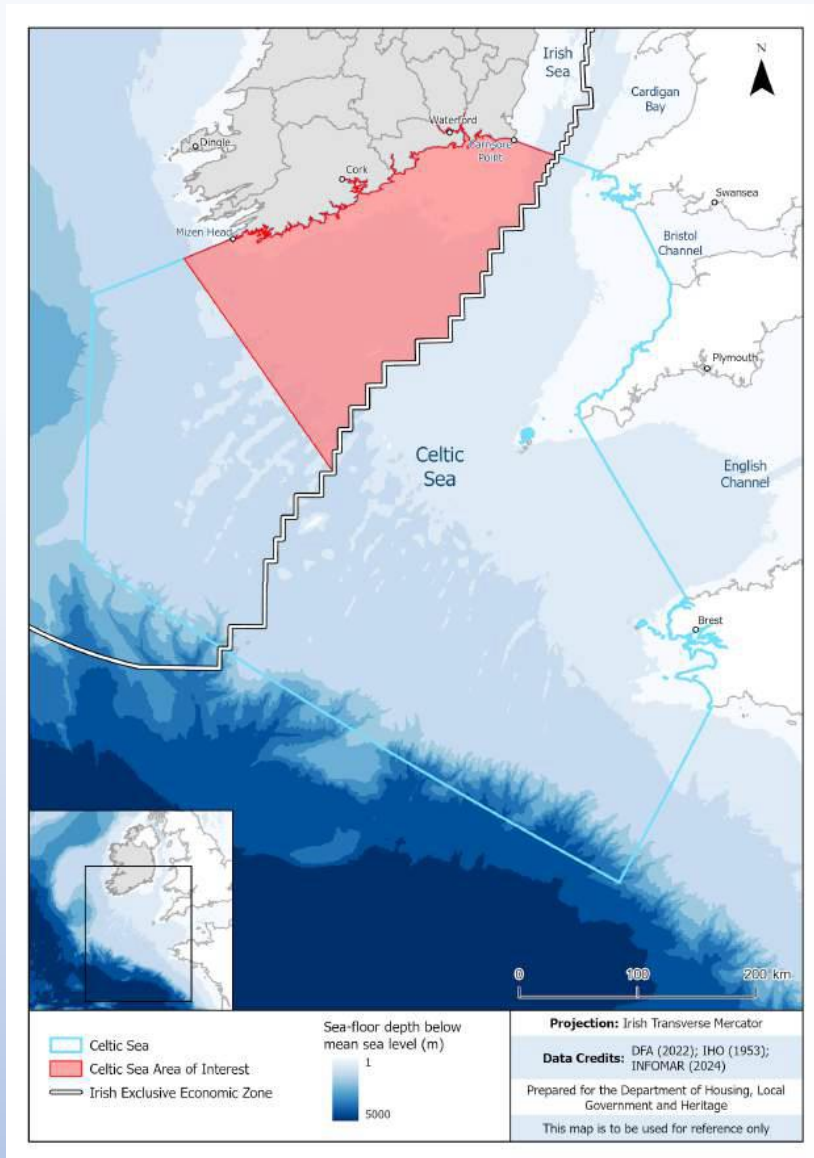
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## PROJECT BACKGROUND



*‘maritime spatial planning’ means a process by which the relevant Member State’s authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives’*

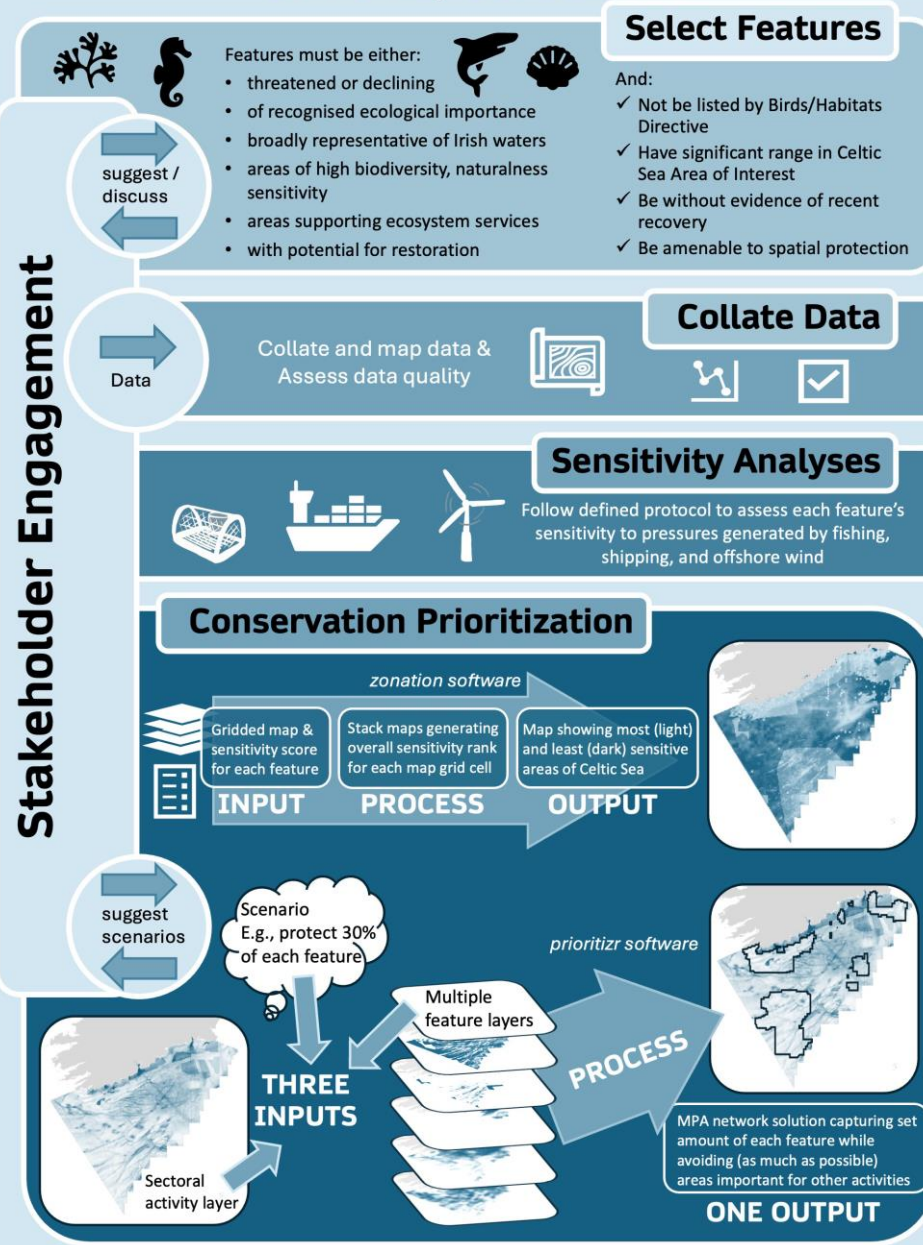
Art. 3, MARITIME AREA PLANNING ACT 2021

Role of the advisory group:  
*to scientifically evaluate the potential need for area-based conservation measures in the Celtic Sea, in the form of new MPAs underpinned by forthcoming national legislation.*

## PROJECT OBJECTIVES

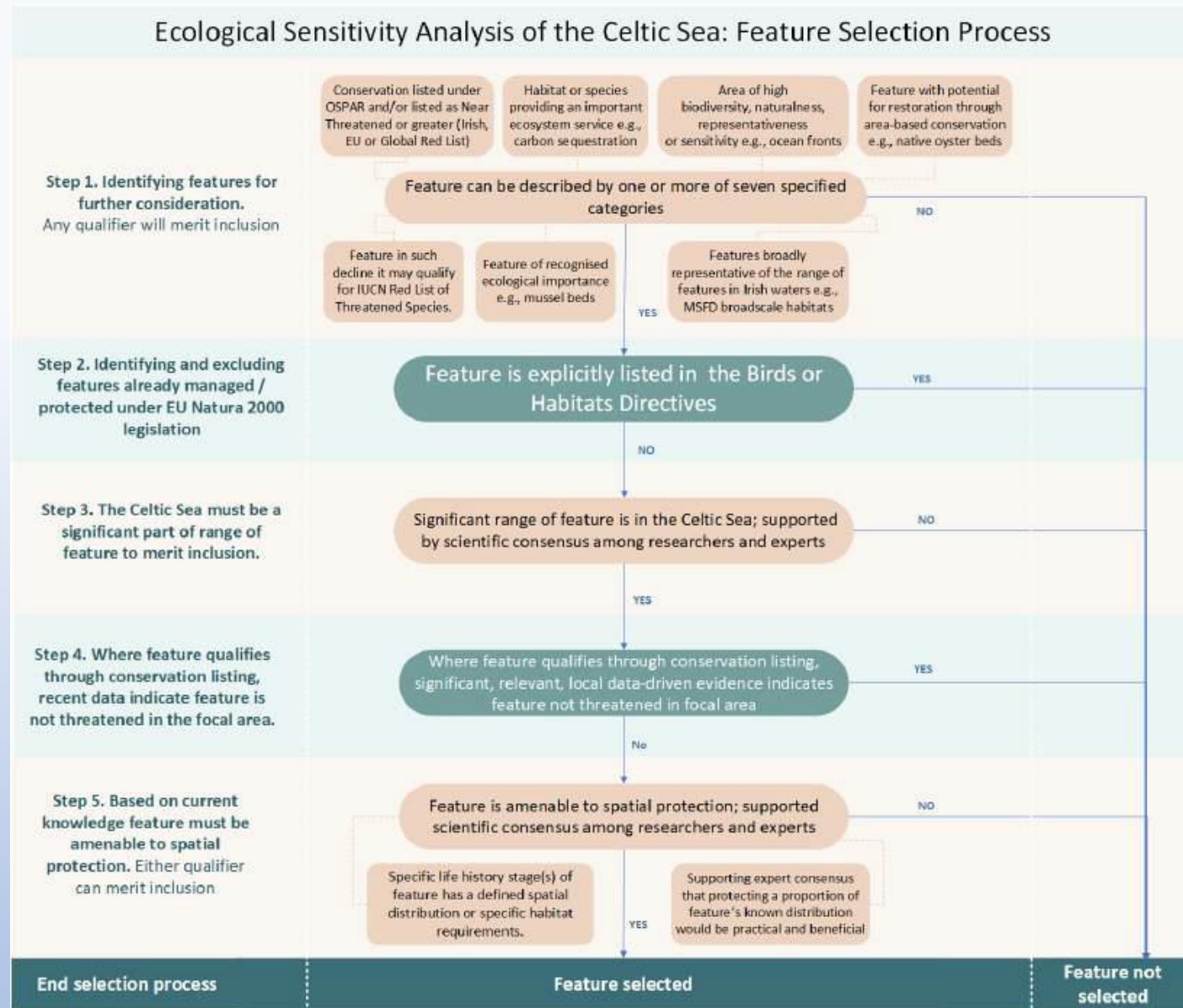
- Objective 1. To undertake a comprehensive scientific **screening exercise for possible future MPAs** in a defined marine region off the south of Ireland. This will be done through a process and using selection criteria and features that are as consistent as possible with the provisions set out in the forthcoming MPA legislation and the predecessor study focused on the western Irish Sea and concluded in June 2023.
- Objective 2. To facilitate open and constructive **engagement with key Government and non-Government stakeholders** that have extensive maritime interests in the Celtic Sea (e.g. culture/heritage, defence, fisheries, ORE, transport, recreation), in order to integrate their participation and consider their interests as part of the analysis and mapping processes within the project.
- Objective 3. To ensure that any rationales and recommendations for the potential designation of MPAs in the study area, as determined by the work of the reconstituted MPA Advisory Group, will be up to date and **in time for active consideration** by DHLGH when the MPA legislation comes into force.
- Objective 4. To contribute to and facilitate possible future **identification by the Government of viable “go-to-areas” for offshore renewable energy projects in the Celtic Sea**, in view of any biodiversity/environmental/cultural constraints that are concluded via the project.

## Summary of Methods



## Sensitivity Assessment of the Celtic Sea

# Feature Selection



## Feature List

- 1 Basking shark
- 2 Blonde ray
- 3 Blue skate
- 4 Bull huss
- 5 Flapper skate
- 6 Shagreen ray
- 7 Small-Eyed ray
- 8 Starry smooth-hound
- 9 Tope
- 10 Common spiny lobster
- 11 Fan mussel
- 12 Ocean quahog (Icelandic cyprine)
- 13 European eel
- 14 Ocean sunfish
- 15 Salmon
- 16 Short-snouted seahorse
- 17 Spiny seahorse
- 18 Turbot
- 19 Circalittoral coarse sediment
- 20 Circalittoral mud
- 21 Circalittoral rock & biogenic reef
- 22 Circalittoral sand
- 23 Infralittoral coarse sediment
- 24 Infralittoral mud
- 25 Infralittoral rock & biogenic reef
- 26 Infralittoral sand
- 27 Offshore circalittoral coarse sediment
- 28 Offshore circalittoral mud
- 29 Offshore circalittoral rock & biogenic reef
- 30 Offshore circalittoral sand
- 31 Offshore circalittoral mixed sediment
- 32 Celtic Sea frontal systems (two non-overlapping layers: Celtic Sea Front, and coastal system)
- 33 Intertidal *Mytilus edulis* beds
- 34 Kelp forest
- 35 *Sabellaria spinulosa* reefs
- 36 Sea pen & burrowing megafauna
- 37 *Zostera* beds
- 38 Carbon Sequestration (two layers: organic carbon stock, organic carbon content).
- 39 Elasmobranch critical egg-laying habitat
- 40a Forage fish 1 (sprat, anchovy, pilchard)
- 40b Forage fish 2 (Sandeel)
- 41 Herring spawning areas

# Data Suitability

Suitability Rating	Description
<b>Complete</b>	Boundary data, defined by a regulatory or national authority.
<b>High</b>	The ideal dataset for these analyses would be systematically collected without bias, using techniques specific to the feature(s) in question. It would have intensive coverage (e.g., on a 1-3 km grid) and would include repeated observations over several years.
<b>Modelled from good data</b>	<p>Modelled distribution data (based on modelling of systematic design-based observed data). The modelling process enables interpolation to areas not sampled and therefore has high spatial coverage. Uncertainty depends on the predictive power of the model.</p> <p>Examples include survey data used to model the predicted distribution of species, vessel monitoring system (VMS) data which is extrapolated to a grid, and modelled estimates derived from acoustic data ground-truthed with observed samples.</p>
<b>Modelled from moderate data</b>	<p>Modelled distribution data that may have a spatial bias or provide incomplete information on the potential distribution of the feature.</p> <p>Examples are provided in Appendix 6 and include species distributions from fisheries effort and catch data interpolated or raised to a grid.</p>
<b>Good; observed data</b>	<p>Data acquired systematically which covers a large spatial area, but not the entire area of interest, and preferably with repeated measures over a long time series. These data ideally will provide a good spatial representation of the area but the distance between observations is much larger than the distance between planning units. This category also represents data sources which were combined to give a higher spatial coverage of a feature.</p> <p>Examples include observed data acquired from systematic surveys.</p>
<b>Moderate; observed data</b>	<p>Data acquired systematically or opportunistically, is not modelled, and covers only a limited area relative to the potential distribution of the feature.</p> <p>Examples include citizen science data and sea angling data.</p>
<b>Unsuitable for CP</b>	Data exist in the area of interest but are older than 10 years (for mobile features) or 30 years (for static features) OR are anecdotal OR spatially imprecise.
<b>N/A</b>	No data available in the area of interest.



# SENSITIVITY ANALYSIS

- Assessment of sensitivity of features to pressures associated with focal sectoral activities - fishing, ORE, shipping
  - e.g. smothering, underwater noise, selective extraction of species, electromagnetic charges, changes in water flow - specified in established list
- Uses available evidence to categorize resistance and resilience for each feature to each pressure and combines to estimate sensitivity
- Quality, concordance and applicability of evidence also characterized
- Process fully transparent; uses MarLIN's MARESA protocol (Tyler-Walters et al. 2018)

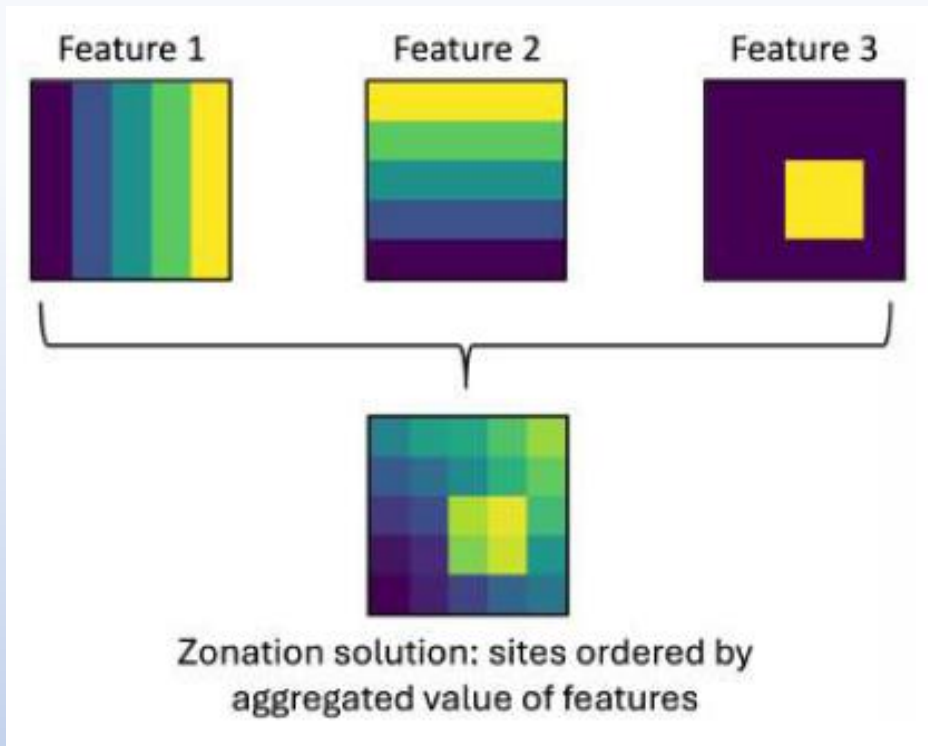
	Resistance			
Resilience	None	Low	Medium	High
Very low	High	High	Medium	Low
Low	High	High	Medium	Low
Medium	Medium	Medium	Medium	Low
High	Medium	Low	Low	Not sensitive

[https://www.marlin.ac.uk//sensitivity/sensitivity\\_rationale](https://www.marlin.ac.uk//sensitivity/sensitivity_rationale)

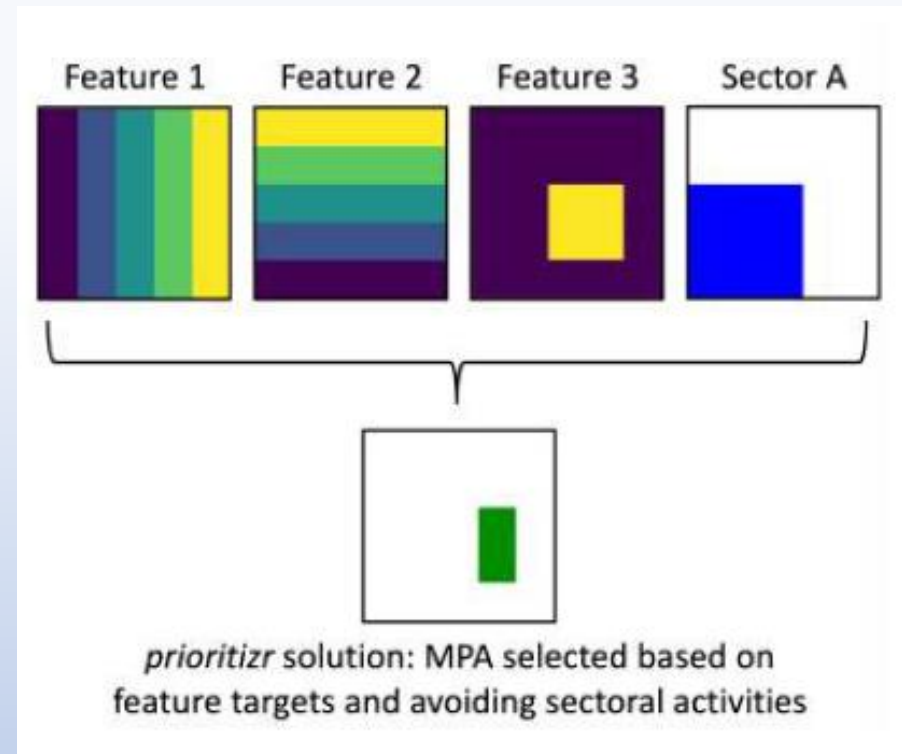


# CONSERVATION PRORITIZATION MODELLING

## Zonation



## PrioritizR



# Areas of highest ecological sensitivity

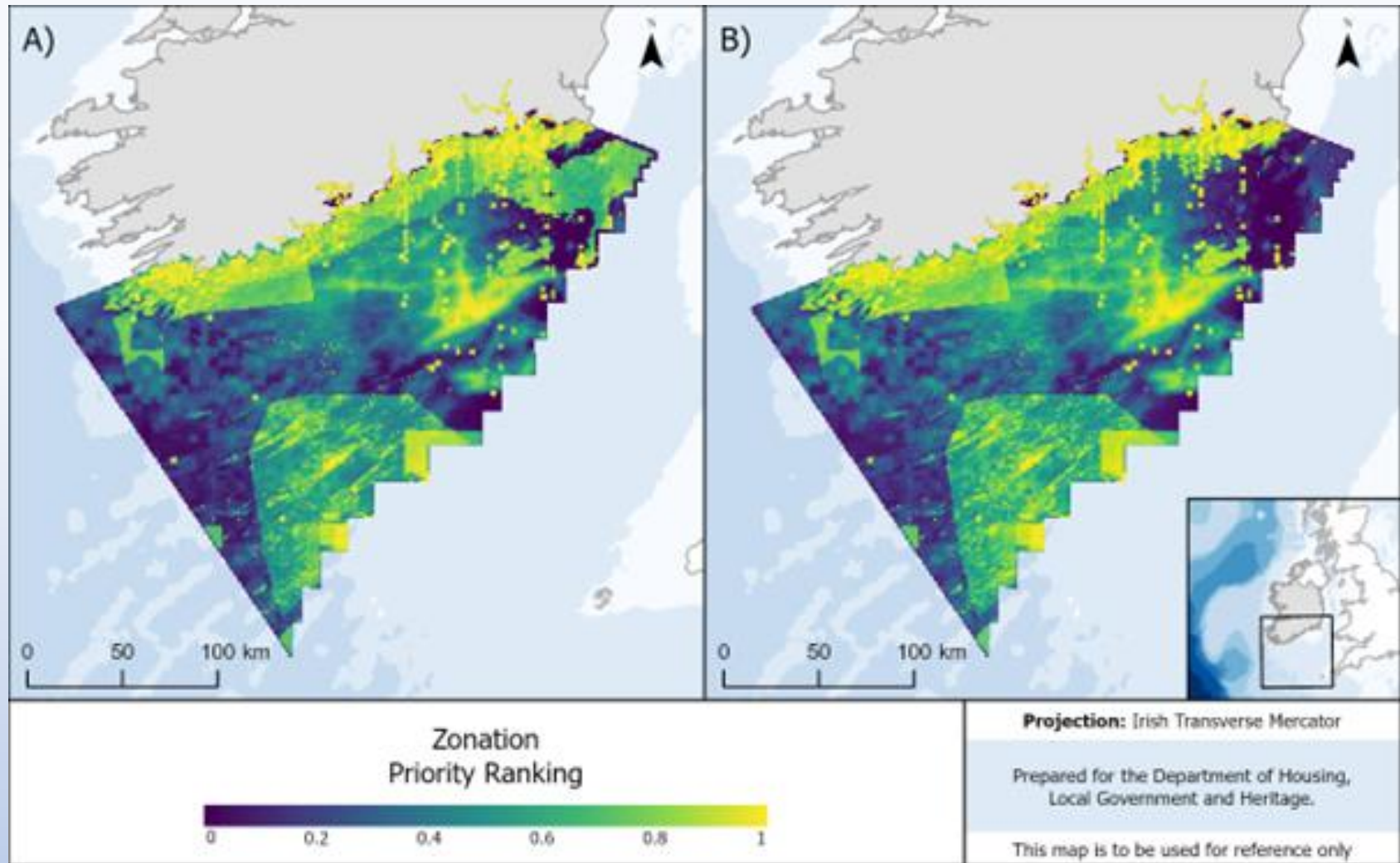
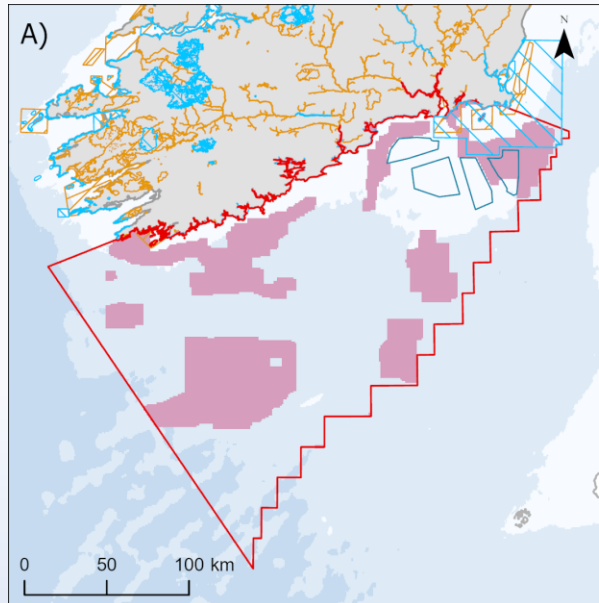


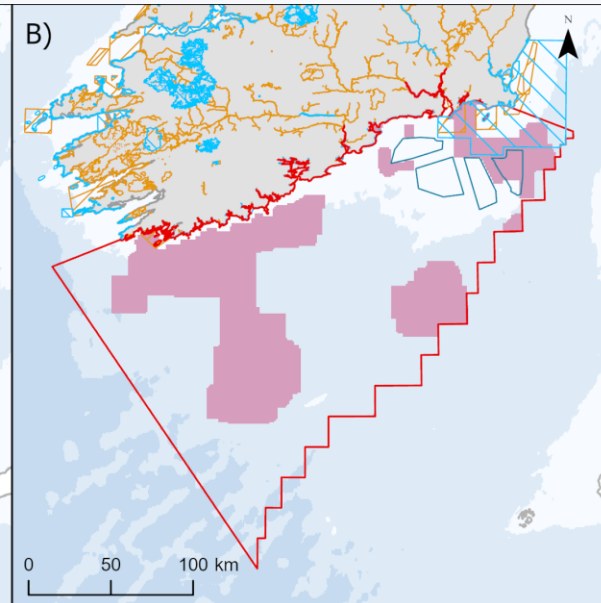
Figure 3.5.1. Ranking using Zonation of conservation value for 1 km<sup>2</sup> locations, based on the 31 features comprising 34 feature layers (see Table 3.1.1) where data were suitable for analysis. Brighter colours show areas with higher value in terms of multiple features and/or the coverage of rarer features. A) feature layers were weighted equally. B) feature layers for the Celtic Sea and coastal fronts switched off for comparative purposes.

# Generating conservation networks

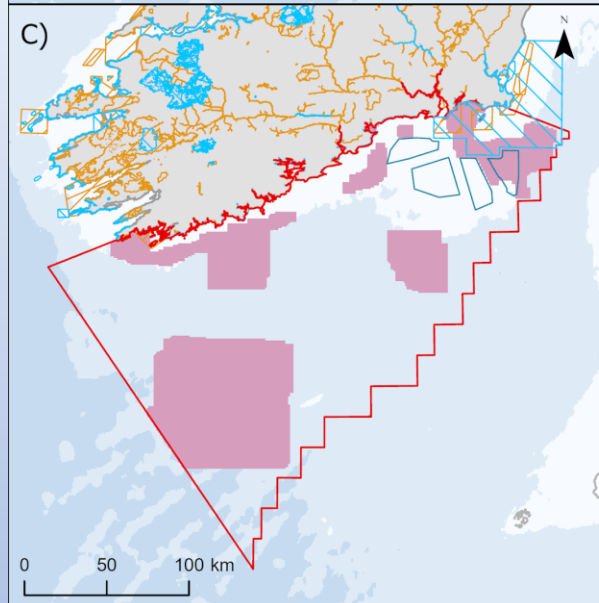
With ORE  
Fishing wgt by  
effort



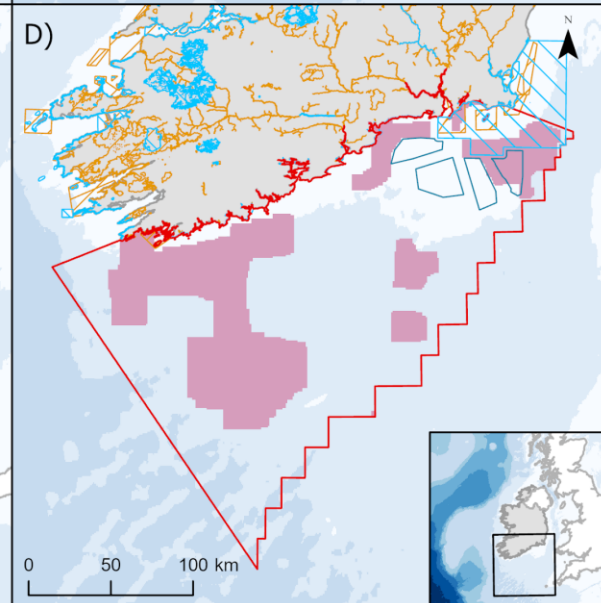
With ORE  
Fishing wgt by  
gear type



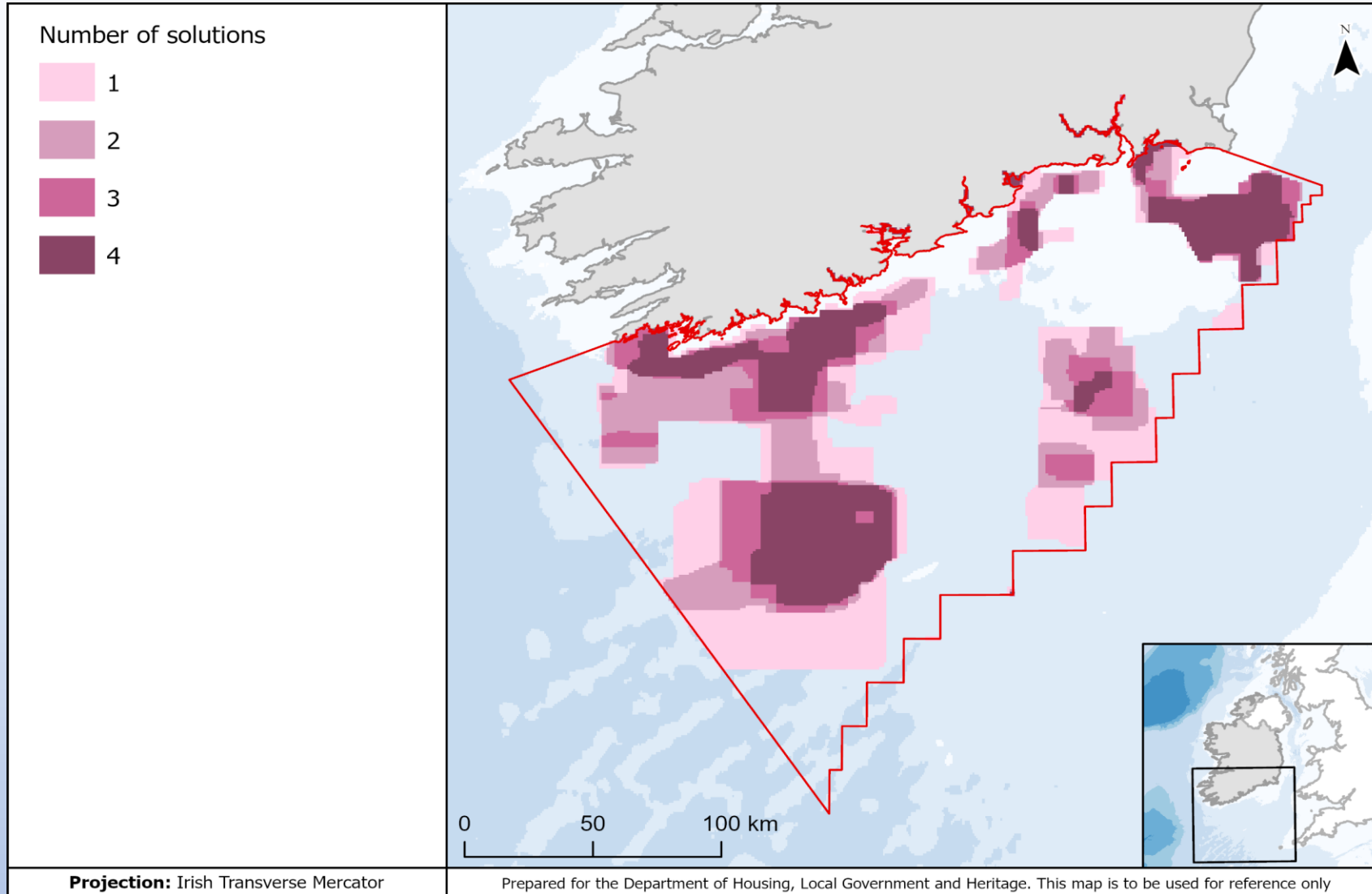
With ORE  
Fishing wgt by  
value



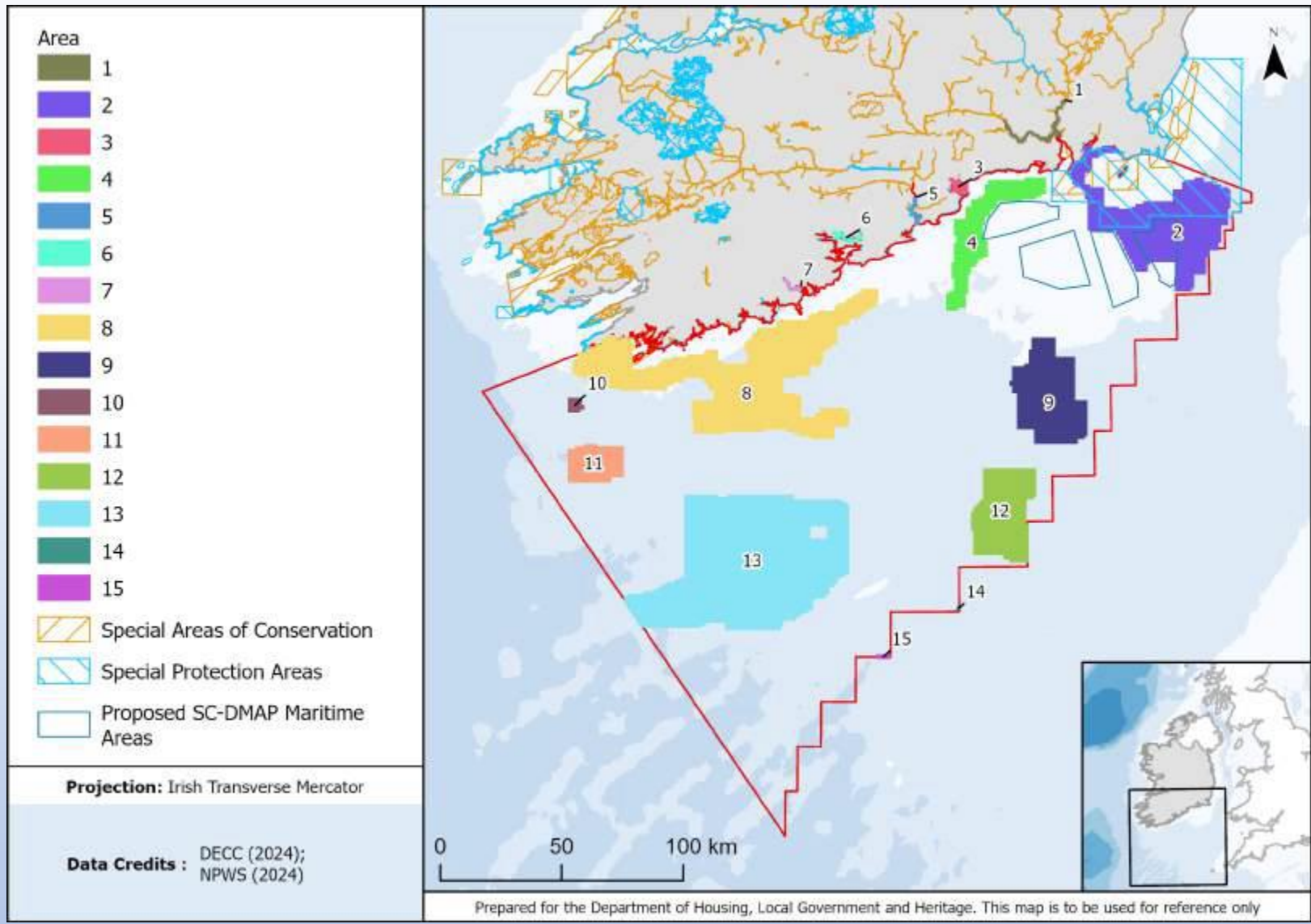
With ORE  
Fishing wgt by  
vessel number



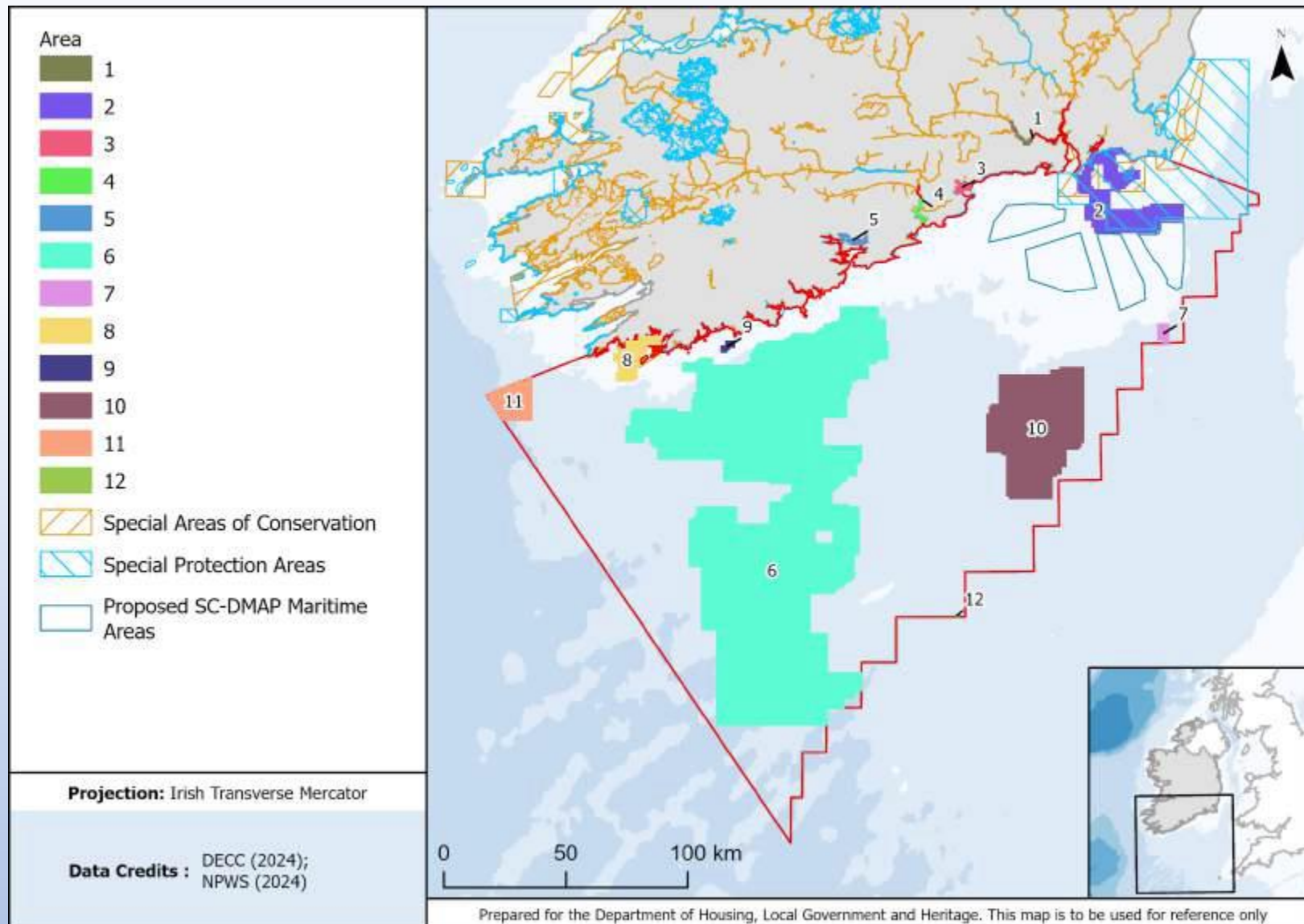
# Generating conservation networks



# CONSERVATION SCENARIOS

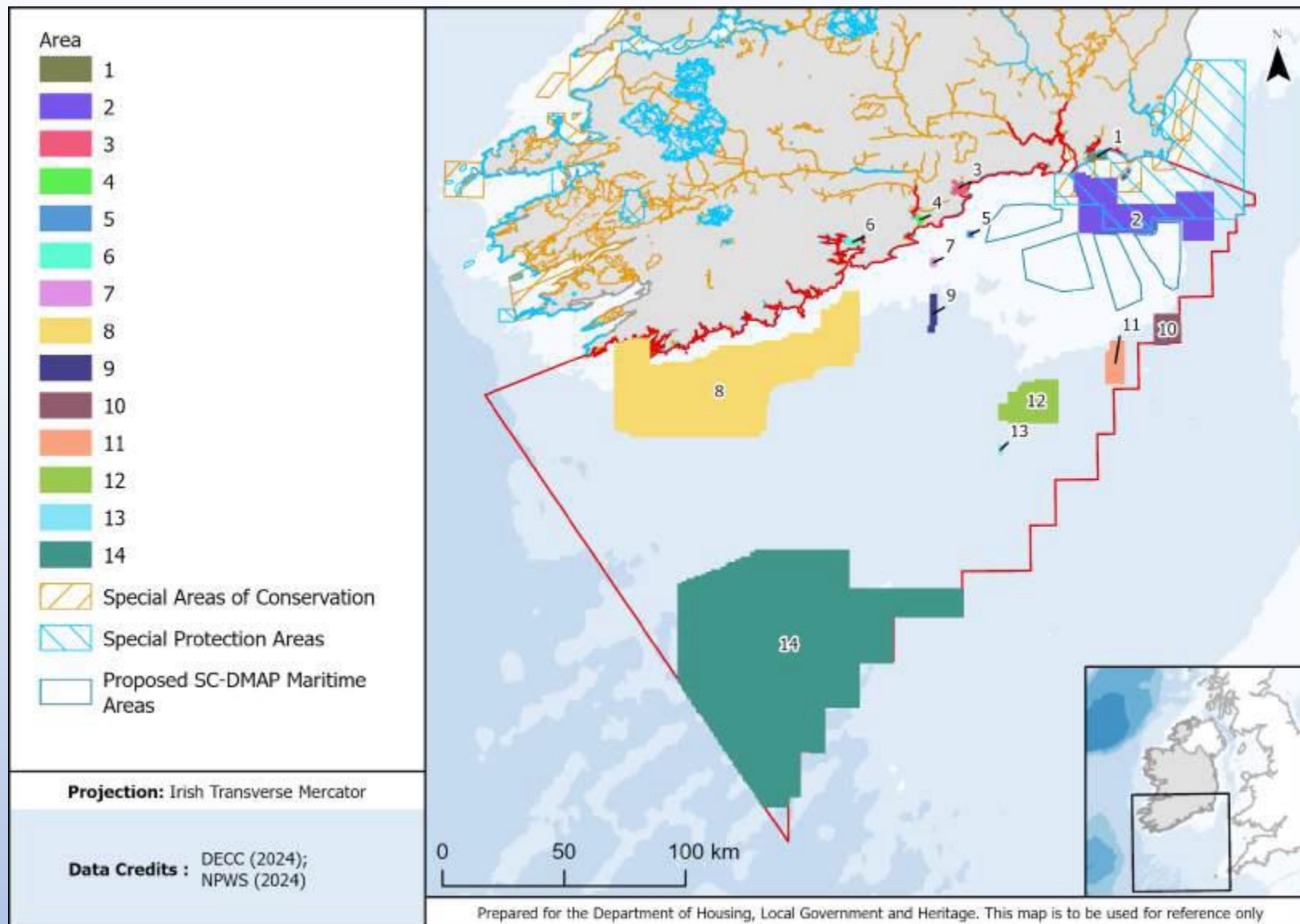


# CONSERVATION SCENARIOS

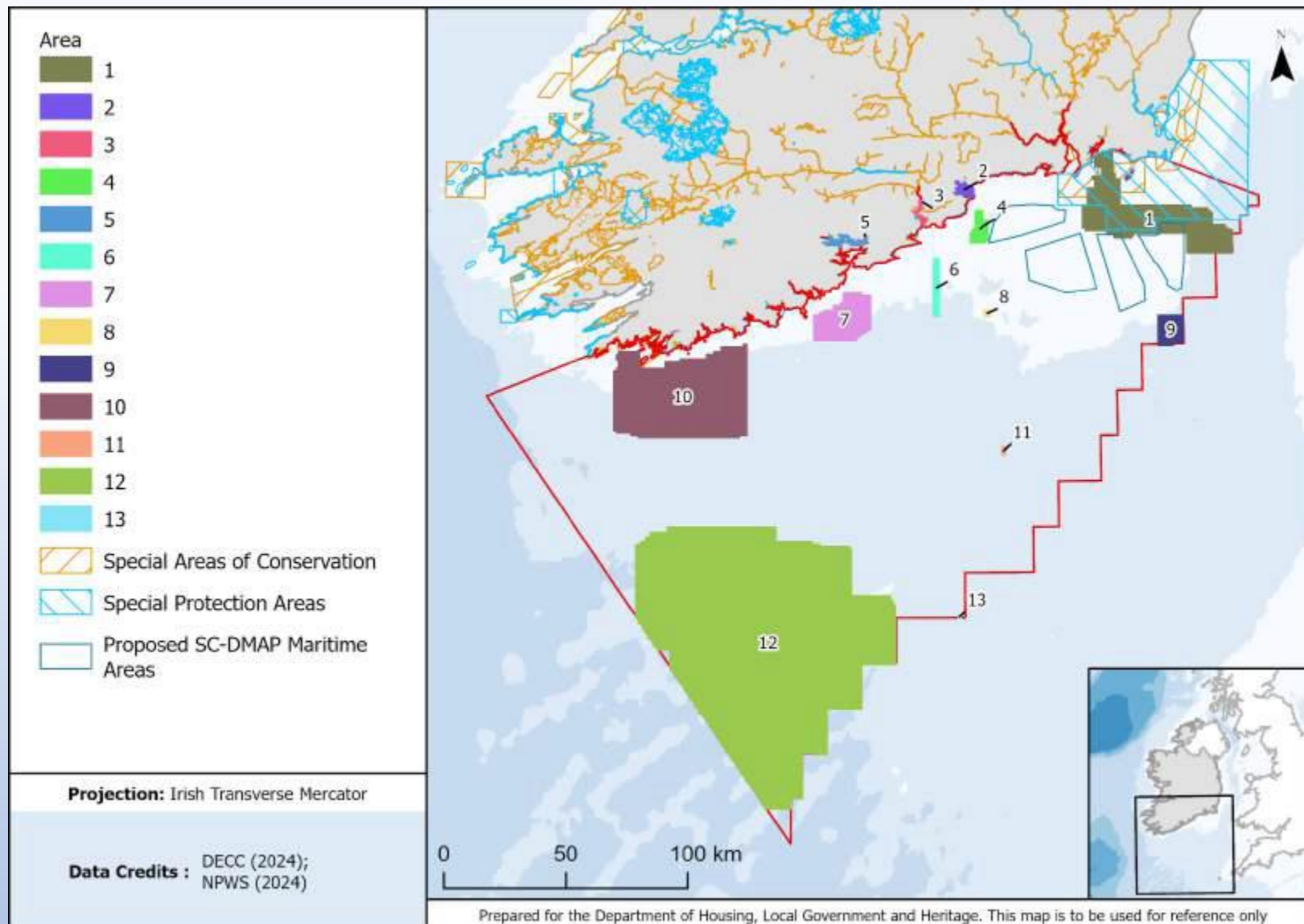




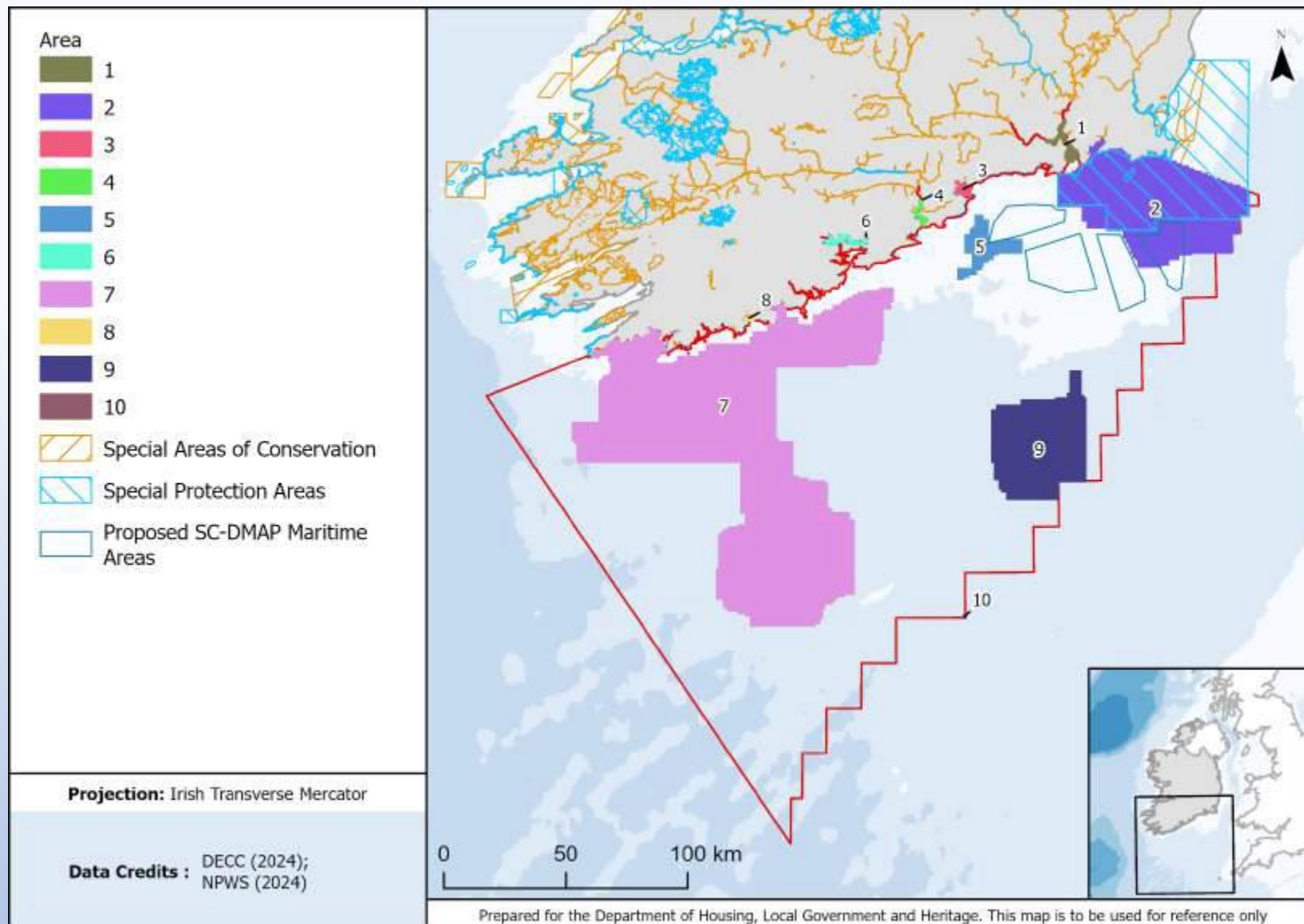
# CONSERVATION SCENARIOS



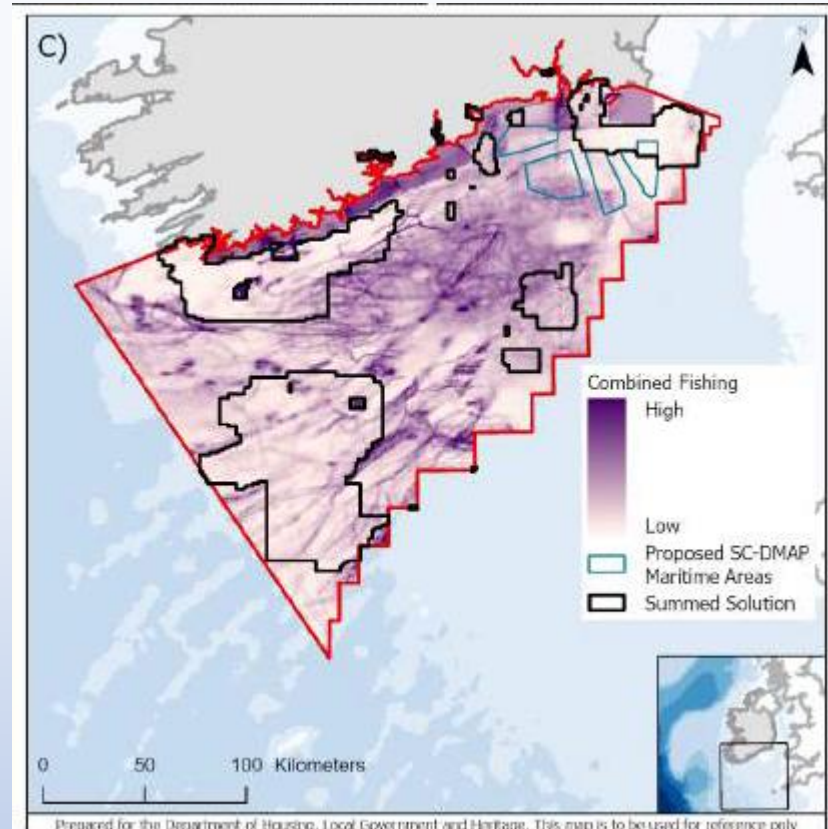
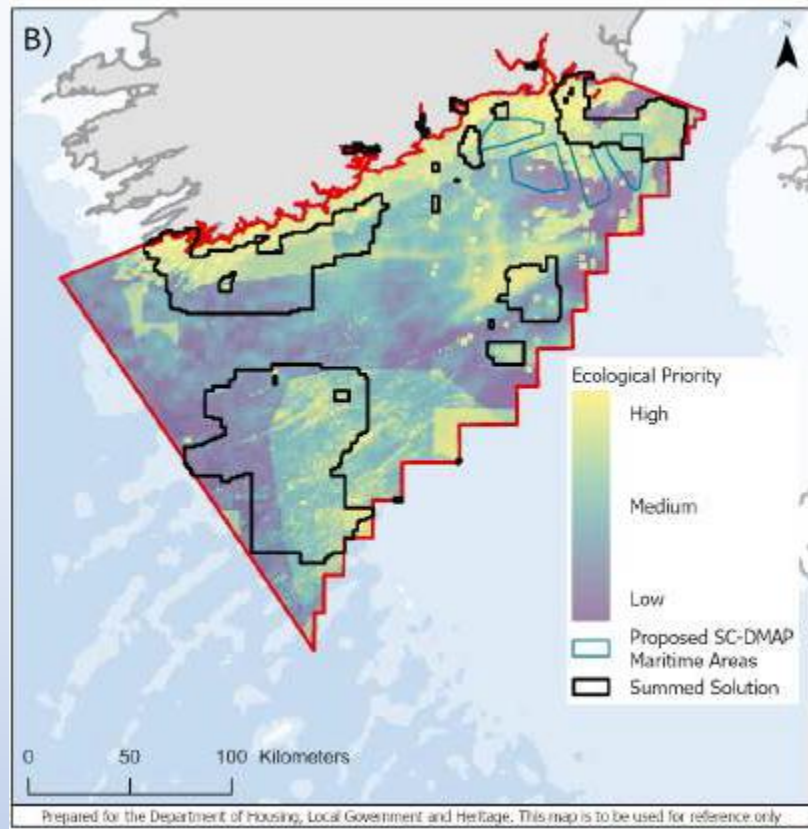
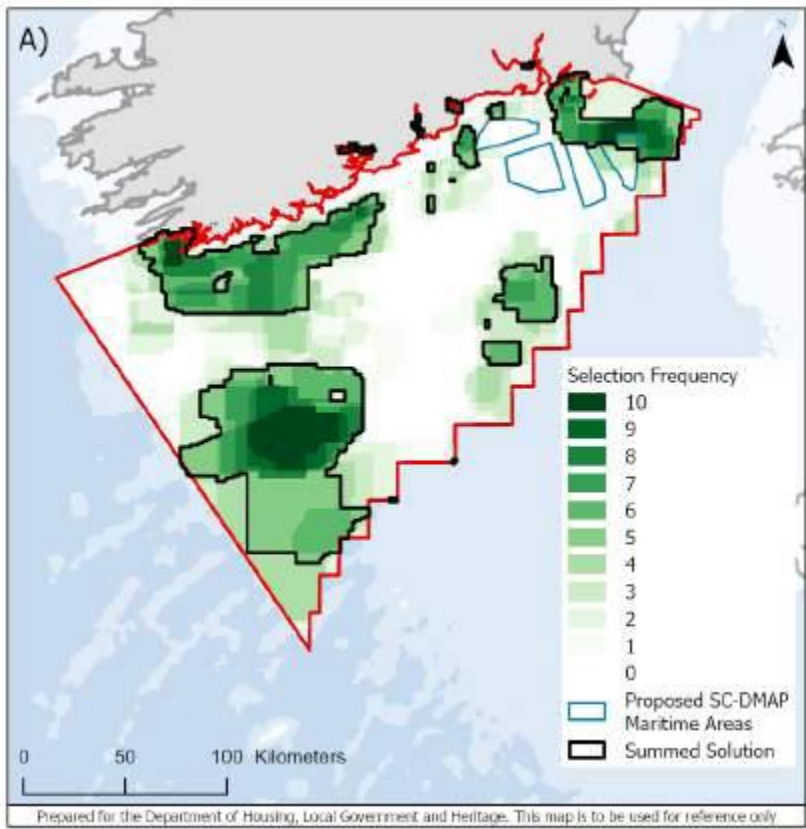
# CONSERVATION SCENARIOS



# CONSERVATION SCENARIOS



# Summed solution



## STAKEHOLDER PARTICIPATION

### Inform

**Aim:** transparency and clarity, inform wide range of stakeholders and provide opportunity for comment, questions and clarification

**Actions:** Email on 15<sup>th</sup> January

### Involve

**Aim:** involve relevant govt departments and agencies, seek input, request data, hear and acknowledge potential concerns

**Actions:** Two meetings online 24<sup>th</sup> & 26<sup>th</sup> January

### Engage

**Aim:** engage with key non-govt stakeholders, hear and discuss perspectives and concerns

**Actions:** Full day meetings 9<sup>th</sup> & 16<sup>th</sup> February.  
Online survey.

### Disseminate

**Aim:** present the outcome of the work, provide a chance for stakeholders to follow up

**Actions:** TBA

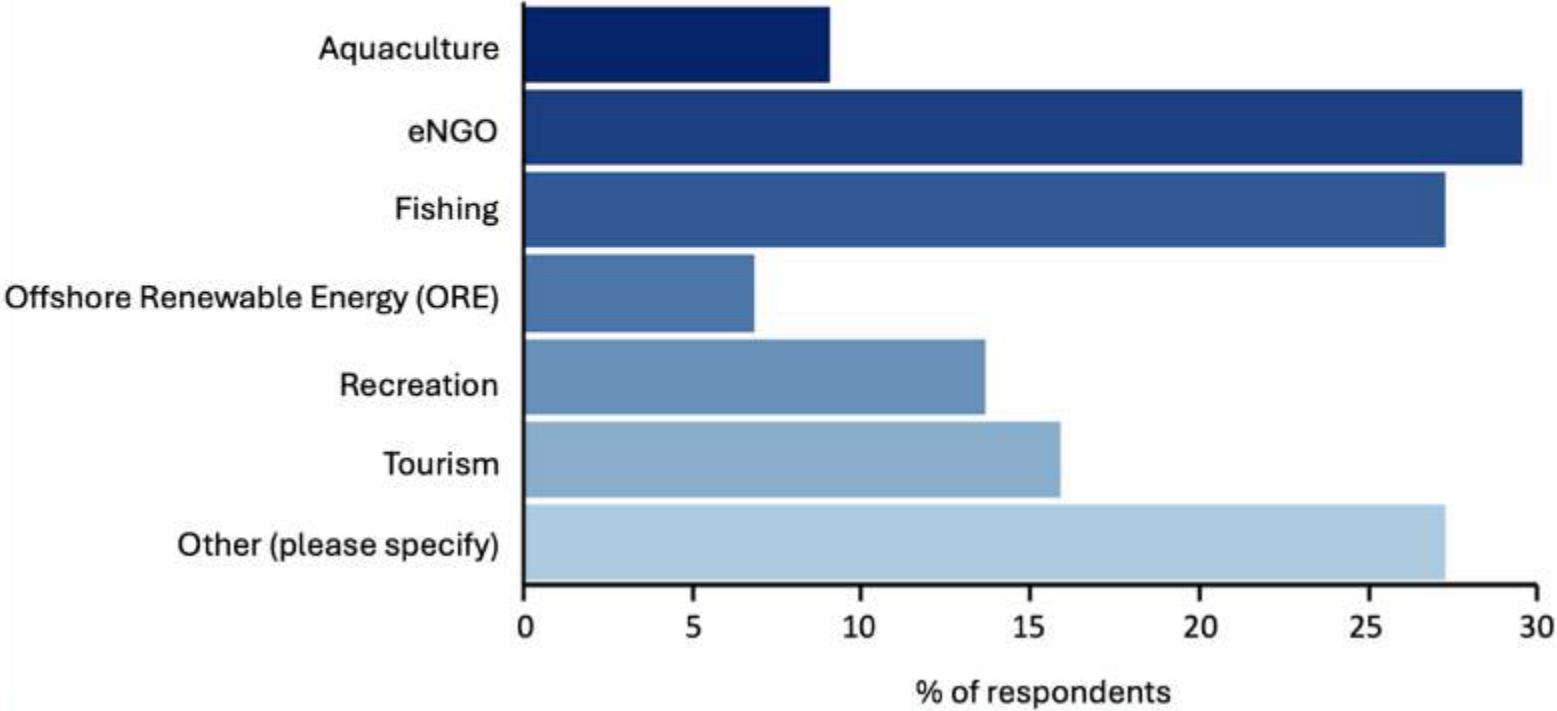
## Summary of topics

- Participants emphasised the importance of understanding the main databases used in the current project;
- Participants raised concerns about the lack of specific data, such as acoustic data, related to some cetacean species (e.g. Minke whale);
- Participants raised queries about the list of features being considered by the project;
- Concerns were raised about the lack of clear integration of the socio-economic importance of commercial and recreational fisheries in the project's approach;
- Participants asked about the project's approach regarding existing protected areas, and the impact their size and location might have in identifying further sensitive areas and/or potential MPAs;
- There were concerns about the potential impact on livelihoods and economic activities arising from the project's outcomes.

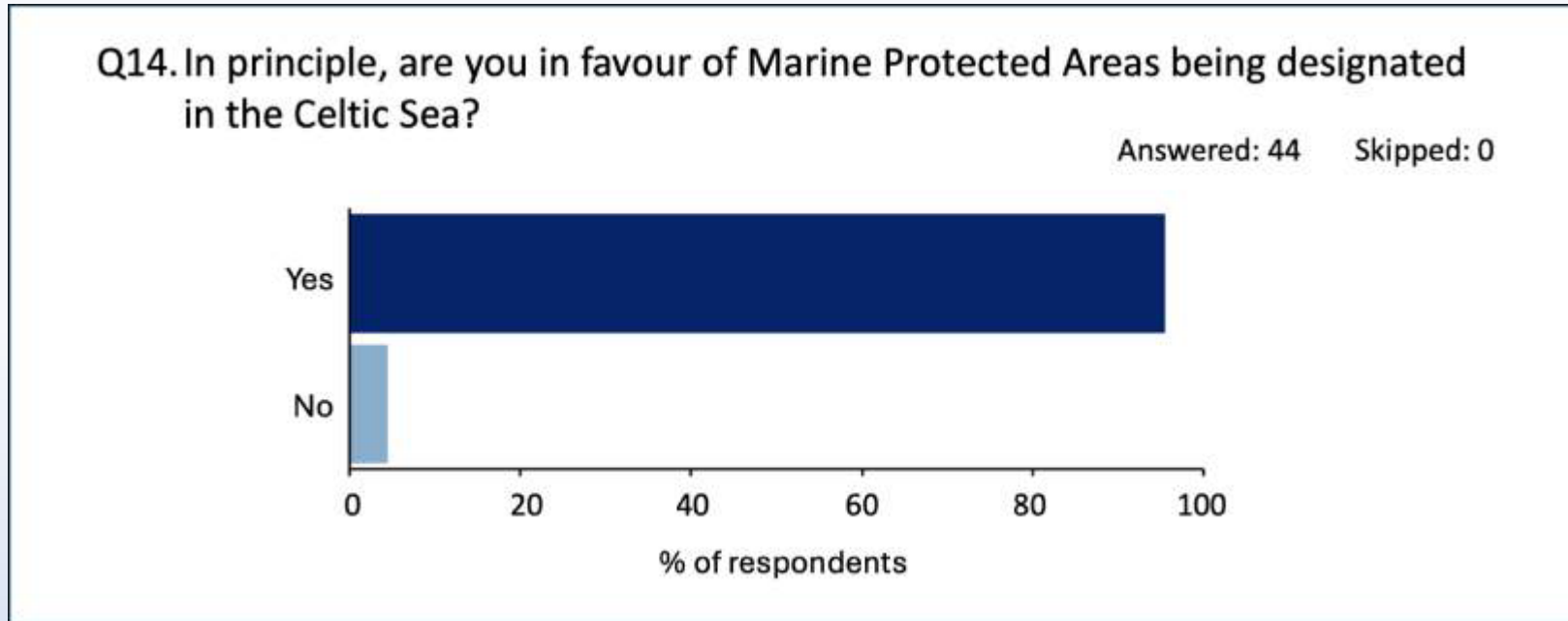
# Stakeholder interests

Q1. What sector or interest do you mainly represent?

Answered: 44 Skipped: 0



## Stakeholder Responses



*“Fishing is responsible for degradation of habitats, loss of biodiversity, loss of species and climate change impacts”*

*“a lack of licensing, regulation and/or policy around certain human activities can potentially result in human induced pressures in marine areas along the Irish coast. To avoid this, the Government should prioritise the effective implementation of regulatory processes, fast tracking of foreshore licensing applications and develop policy where it is needed, in consultation with Irish industry.”*



## Recommendations

- The types of and scope of activities included in future analysis should be expanded.
- Spatial data on fishing vessels < 12m needs to be collected.
- Continued and more widespread stakeholder engagement, given more time.
- Extend citizen science, develop new citizen science programmes.
- Important features for which data was lacking should be prioritised for new data collection.
- MPAs designated under the new MPA bill must be coherent, based on Ireland's entire maritime area, and include existing natura sites.
- ORE and fishing activity should be considered incompatible with MPAs designated for features of high and medium sensitivity, until mitigation renders these activities compatible with conservation objectives.
- Research should be prioritized that aims to discern specific impacts of ORE associated pressures on a broad range of taxa and to better understand the cumulative effects of these pressures on these species.

# Acknowledgements

This project was supported by the Water Division (Marine Environment section) of the Department of Housing, Local Government and Heritage. We are grateful to Oliver Ó Cadhla, Joanne Kenny, Tim O'Higgins and Richard Cronin for their guidance and contributions during this work.

The project drew heavily on the framework provided by the similar study conducted in the western Irish Sea, also led by members of the MPA Advisory Group. We particularly acknowledge the authors of the previous report. The present report deliberately mirrors that of the 'Ecological Sensitivity Analysis of the Irish Sea' (Marine Protected Area Advisory Group, 2023), in order to make comparisons between the two studies easy, and to facilitate understanding by interested parties who are already familiar with the Irish Sea report. Where the same methods are used, they are described identically, to make clear that the processes undertaken in the two studies are congruent. Additionally, where there are strong commonalities in for instance (but not only), stakeholder views, conclusions, key messages, and recommendations between the two reports, efforts have been made to retain/mirror the wording in the Irish Sea report to emphasize these commonalities.

For facilitating the non-governmental and sectoral stakeholder engagement sessions we sincerely thank Mr Pádraic Ó Máille of Smácht, Ó Máille Group.

For producing the global distribution maps in feature case reports, we thank Philip Markey.

For expert advice and information we thank: Luke Cameron, Mark Chatting, Jim Clohessy, Mark Coughlan, Kealan Doyle, Tom Doyle, Karin Dubsy, Afra Egan, Edward Farrell, Neil Garrick-Maidment, Hans Gerritsen, Anthony Grey, Gary Hannon, Louise Healy, Mark Jessopp, Graham Johnston, Hugo Maxwell, Natasha Murphy, Glenn Nolan, Macdara Ó Cuaig, Rory O'Callaghan, Bríd O'Connor, Brendan O'Hea, Eimear O'Keefe, Louise Overy, Debbie Pedreschi, Rod Penrose, Russell Poole, Anne Marie Power, Declan Quigley, William Roche, Emer Rogan, Kate Schoenrock-Rossiter, David Tierney, Lisa Underwood, Andrew Wheeler, Robert Wilkes, Mark Willis. See Appendix 9 for further details.

For participation in stakeholder engagement, we thank representatives of: An Taisce, BIM Fisheries Improvement Programme, BirdWatch Ireland, Bord Iascaigh Mhara, Commissioners of Irish Lights, Cork Environmental Forum, Irish Charter Skippers Association, Department of the Environment, Climate and Communications, Eirgrid, Energia - offshore environmental and consent, Environmental Protection Agency, IFA aquaculture, Inis Offshore Wind, Inland Fisheries Ireland, Irish Elasmobranch Group, Irish Naval Service, Irish South and East Fish Producers Organisation, Irish South and West Fish Producers Organisation, Irish Whale and Dolphin Group, Killybegs Fishermen's Organisation, Kilmore Angling, Marine Advisory Geo-solutions, Marine Dimensions, Marine Institute, National Inshore Fishermen's Association, National Inshore Fisheries Forum, National Parks and Wildlife Service, National Youth Council, North Western Waters Advisory Council, Sea Angling Ireland, Sustainable Energy Authority of Ireland, Sustainable Water Network, Wind Energy Ireland. See Appendix 5c for further details and a list of all stakeholders contacted by the MPA Advisory Group.