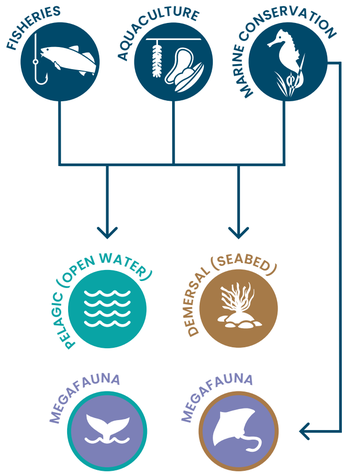
CLIMATE-SMART MANAGEMENT OF UK SEAS

Climate change is already affecting species and habitats in UK seas. These effects are set to markedly increase if greenhouse gas emissions continue to rise and accelerate global warming. Given this urgency, more specific guidance and support is needed to enable planners and other marine managers to implement climate-smart solutions.

This infographic illustrates the projected impacts of climate change on the marine conservation, fisheries, and aquaculture sectors in the UK Exclusive Economic Zone (EEZ), by showing where, and for how long, environmental conditions remain favourable for these sectors over this century.

1

The effects of **climate change** on **fisheries**, **aquaculture** and **marine conservation** were explored for pelagic (open water) and demersal (seabed) environments. Megafauna were analysed for marine conservation only.



2

State of the art **climate modelling** was used to simulate **two emissions scenarios**:

1. **2°C global warming future**
   moderate emissions scenario
2. **4°C global warming future**
   high emissions scenario

3

Each area of the UK EEZ was then categorised according to whether they would become '**Climate Change Hotspots**' or '**Climate Change Refugia**'.

- **Climate Change Hotspots**
  = areas where climate-related pressures drive the natural ecosystem into a different state **(a negative effect)**.
- **Climate Change Refugia**
  = areas that exhibit long-term climate change resilience **(remaining similar to present day)**.

4

FISHERIES

Identified **widespread long-term Climate Change Refugia could support pelagic fisheries** under a moderate emissions scenario, but are **greatly reduced under high emissions**.

Climate change impacts are expected to be widespread by mid-century under both emissions scenarios. **Management measures may support more resilient target species** (e.g. hake and saithe).

AQUACULTURE

Under both emission scenarios, Climate Change **Hotspots would emerge throughout the UK EEZ** and may **reduce the growing potential of currently farmed species in coming decades**.

Under both emissions scenarios, widespread Climate Change **Refugia could support sector expansion for shellfish aquaculture.**

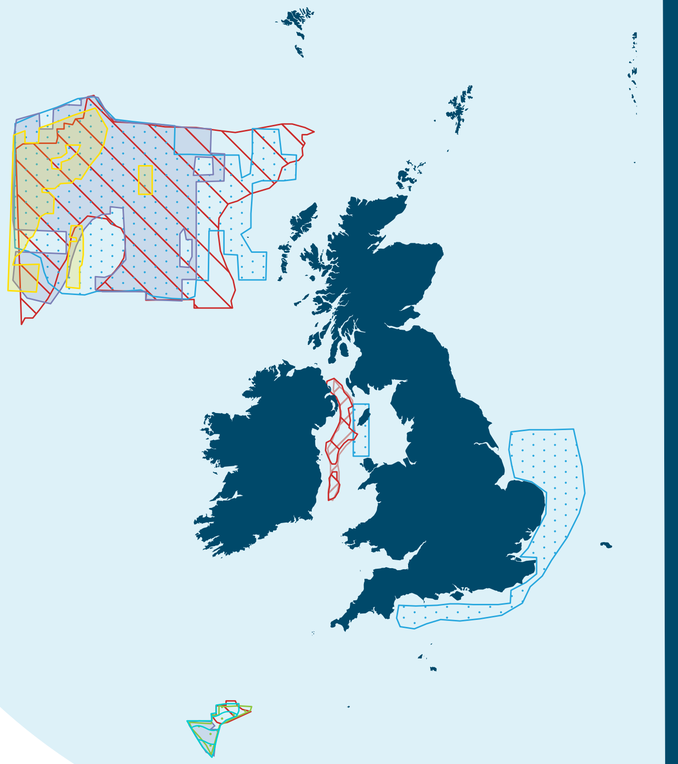
MARINE CONSERVATION

Under a moderate emissions scenario, Climate Change **Refugia are expected to be widespread**, but are substantially reduced by the next decade under high emissions.

Under both emissions scenarios, Climate Change **Hotspots are widespread** as early as the **2030s**.

Climate Change **Hotspots are expected to encompass many existing conservation sites**, but some long-term climate change refuges could be identified. Other uses of the marine environment may exacerbate climate effects.

Under a moderate emissions scenario, Climate Change **Refugia are expected to be widespread**, but are **substantially reduced under high emissions**.



This map illustrates the **location of sites identified as long-term marine Climate Change Refugia**, with high confidence (both emissions scenarios assessed).

Map key:

- PELAGIC FISHERIES
- DEMERSAL FISHERIES
- PELAGIC MEGAFAUNA
- DEMERSAL MEGAFAUNA
- PELAGIC AQUACULTURE
- DEMERSAL AQUACULTURE
- DEMERSAL HABITATS

*Pelagic habitats were not visualised from this analysis because there were no long-term Climate Change Refugia when both emissions scenarios were assessed together.

5

Conclusions:

- Spatially explicit strategies are now needed to address the effects of climate change though marine planning and other spatial management mechanisms across the UK nations and regions.
- Identified marine Climate Change Refugia could be used as part of those strategies, focused on sites that exhibit natural climate change resilience. The location of identified marine Climate Change Hotspots may be used, in turn, to inform the development of spatially explicit climate change adaptation strategies.
- Impacts may arrive earlier and be more widespread under high emissions. Strong curbs to greenhouse gas emissions represent the best hope for UK marine ecosystems, and a sustainable blue economy.

The summary report and full report can be found here.

MSPACE Marine Spatial Planning Addressing Climate Effects

MCCIP Marine Climate Change Impacts Partnership

Curated by Mindfully Wired Communications