

# The changing distributions of herring and sardine on the northwestern European Shelf, consequences for fisheries management.

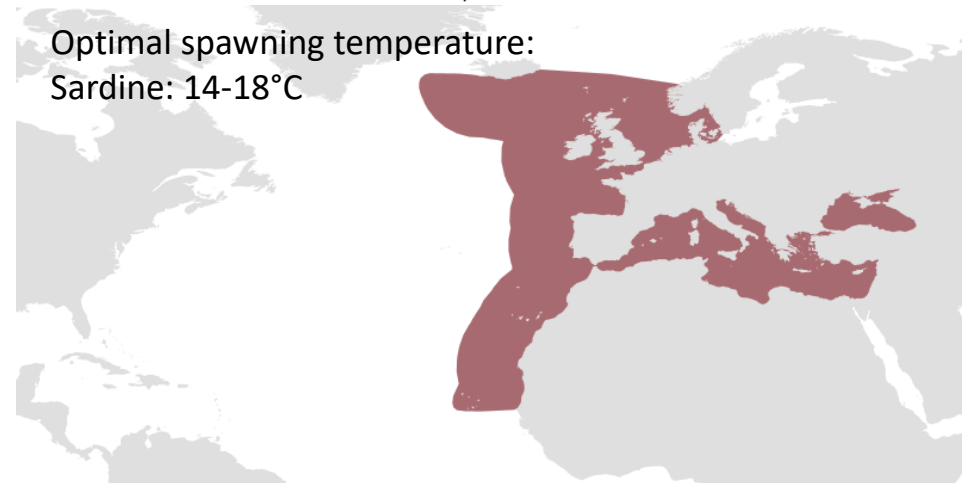
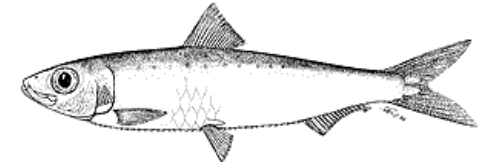
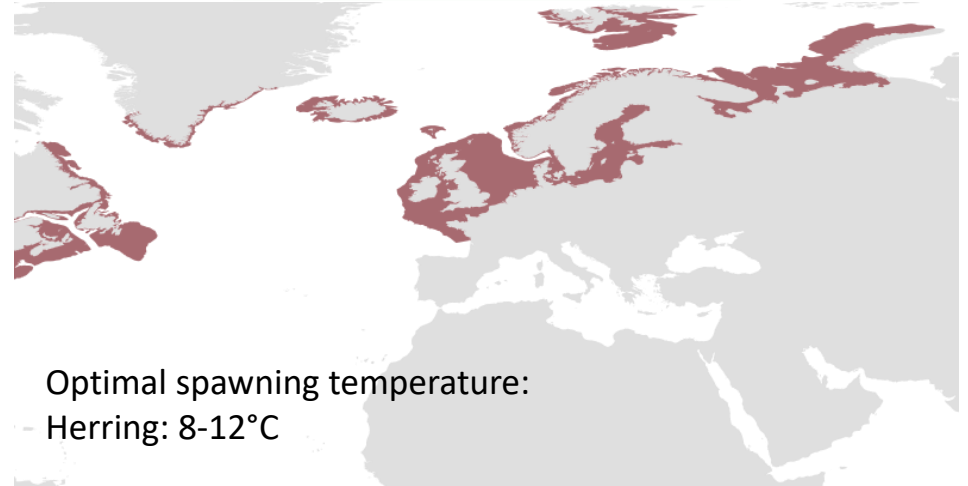
Richard D.M. Nash, Aaron Brazier, Rosana Ourens and Susan Kenyon



# Introduction

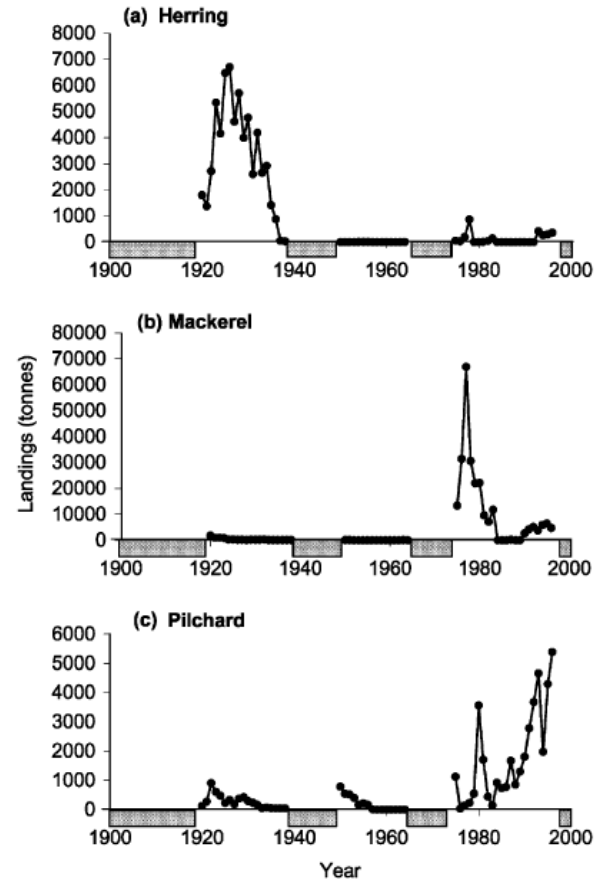
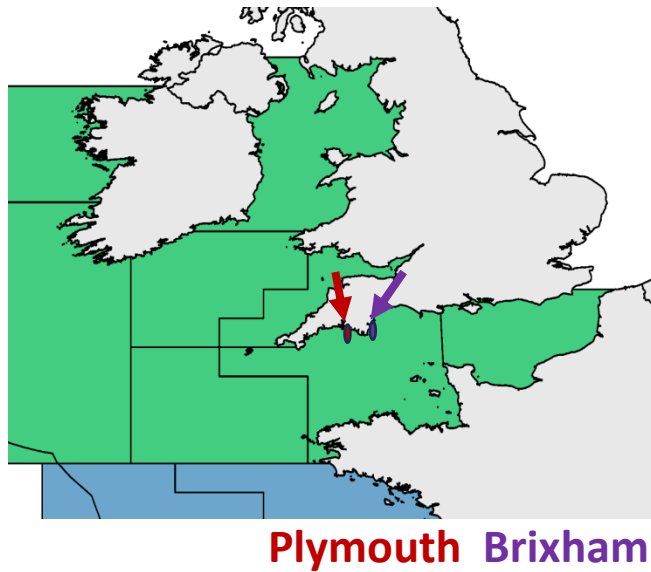
## *Changes in the distribution of small pelagic fish populations over time:*

- Not a new concept.
- In more recent decades, relatively rapid warming of annual temperatures on the northern European shelf.
- Consequences for the distributions of species which have warmer or cooler thermal niches.
- Management (and stock assessment) issues illustrated with two species – herring and sardine

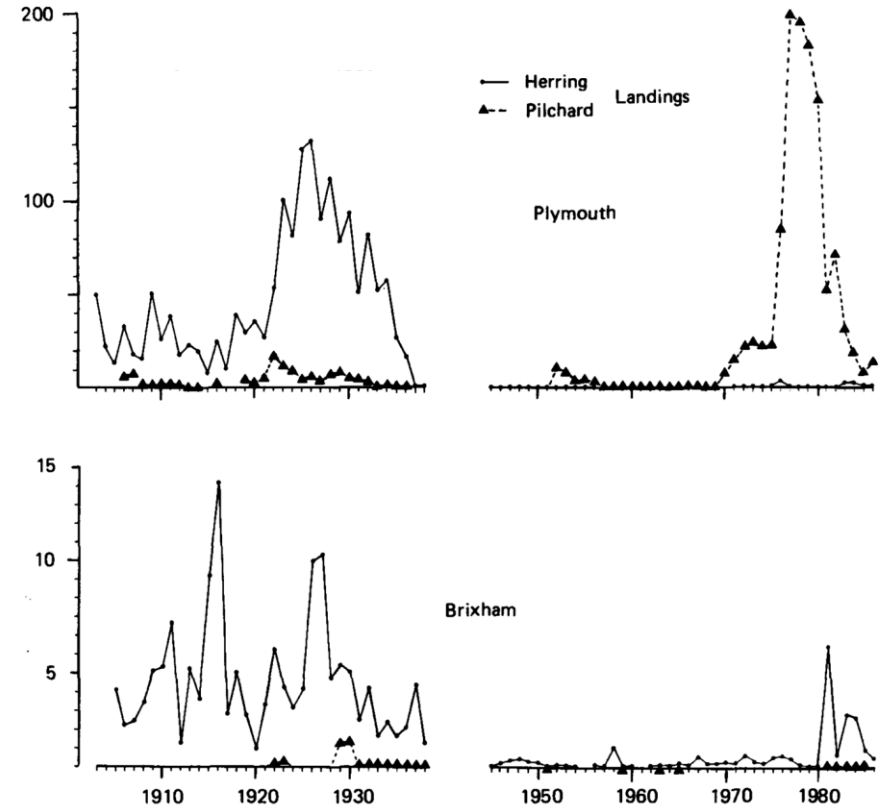


## Background

Historical shifting population abundances in the southwest of the British Isles: Changes in dominance between herring (*Clupea harengus*) and sardine (*Sardina pilchardus*) in the western Channel, to the southwest of the British Isles.



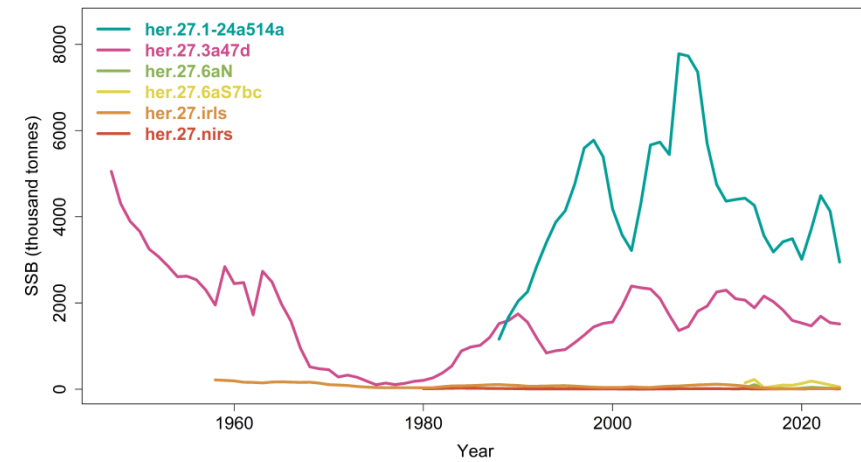
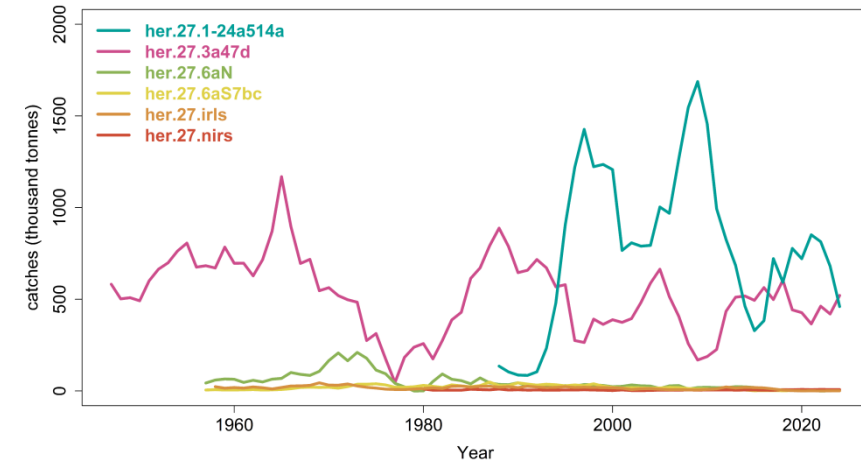
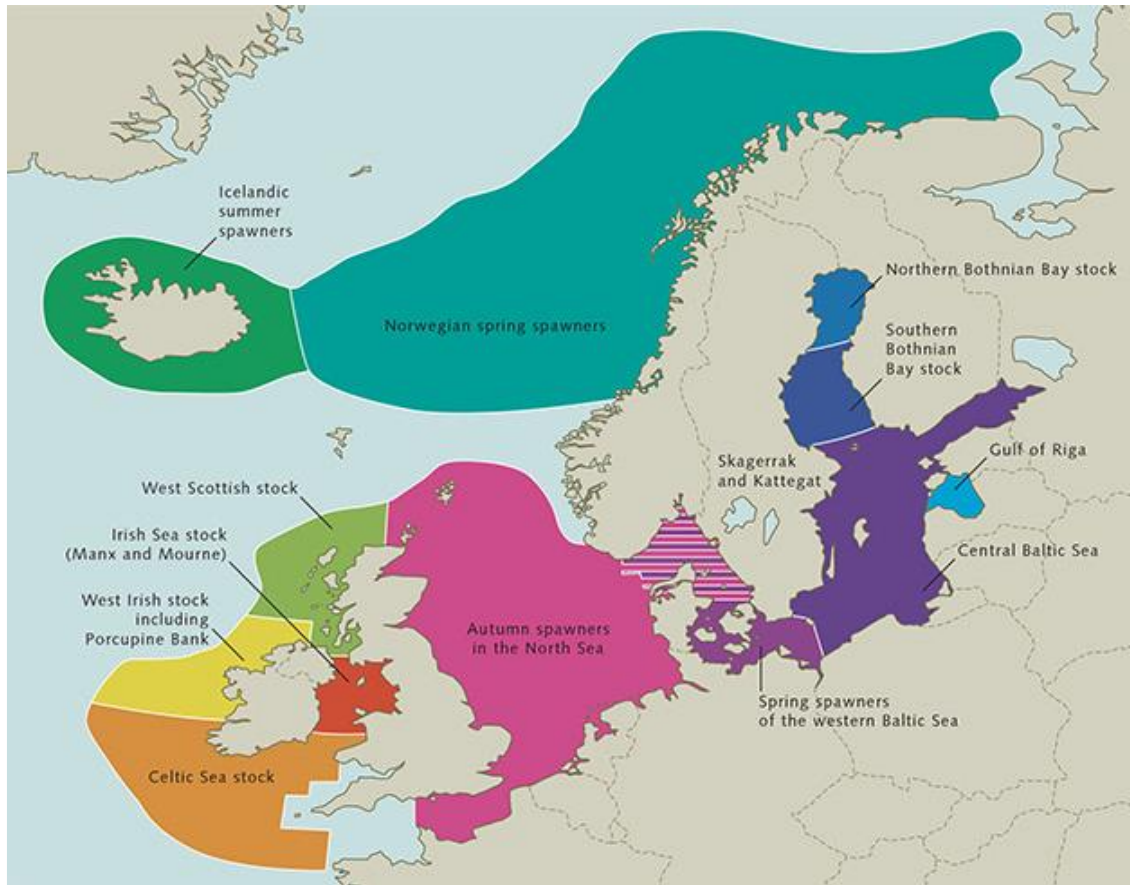
Annual landings of pelagic fish at Plymouth. Data from UK government statistics. Data were unable to be sourced for periods prior to 1919, post 1996 and for years 1965-1974 (indicated by shaded boxes). Hawkins et al. 2003. *The Sci Total Env.* 310, 245-256.



Annual landings of herrings and pilchards at two major southwestern (English) ports, abstracted from the published fishery statistics (1000cwt). Note that for Plymouth the weight scale is different. Southward et al. 1988. *JMBA* 68:423-445

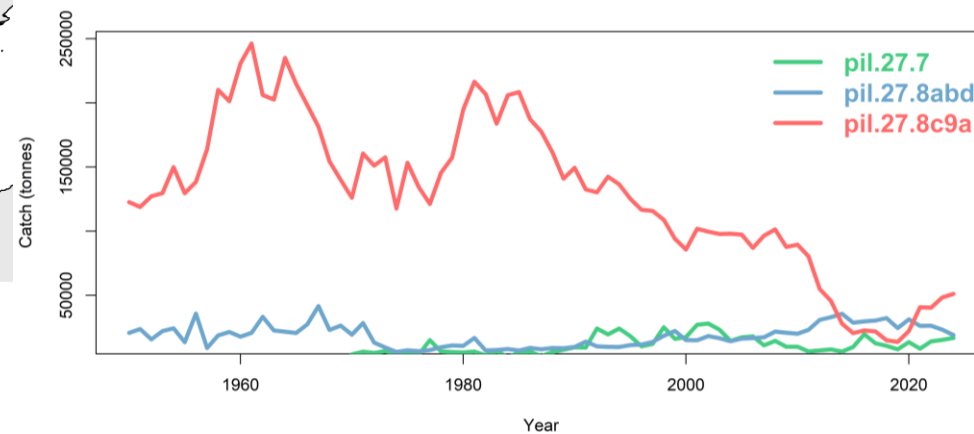
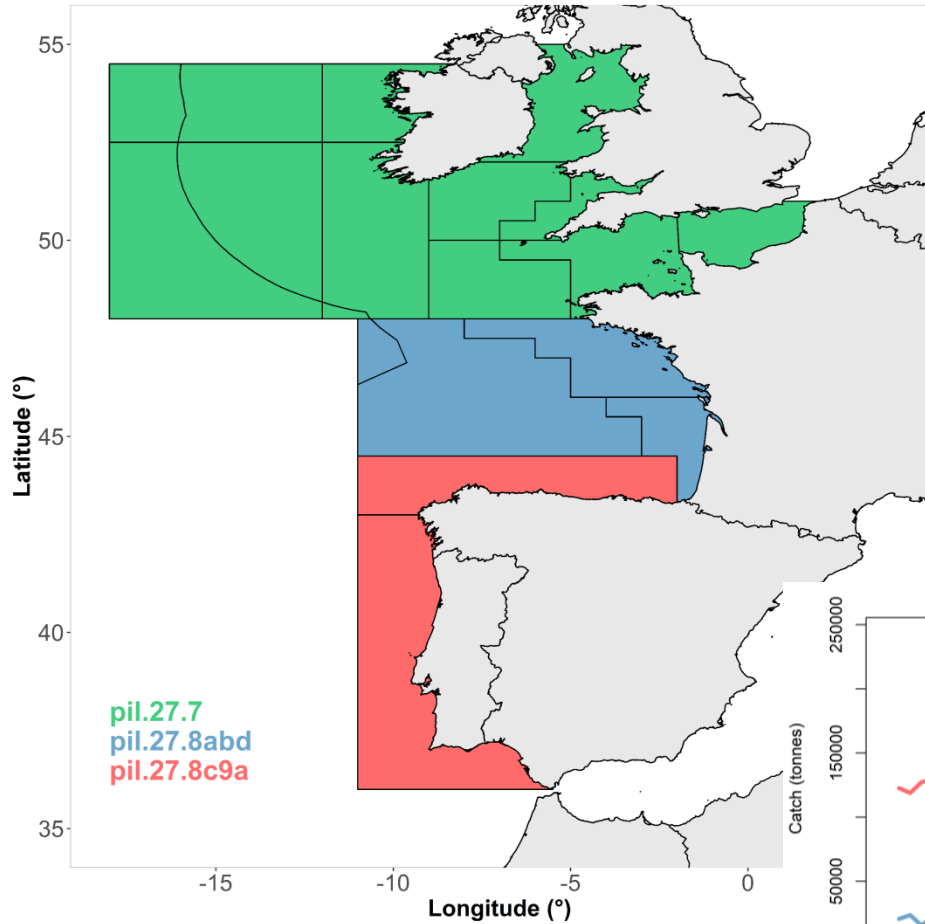
# Herring in the Northeast Atlantic

- The species is considered as comprising quite a large number of genetically distinguishable sub-populations which are assessed and commercially exploited as distinct stocks.

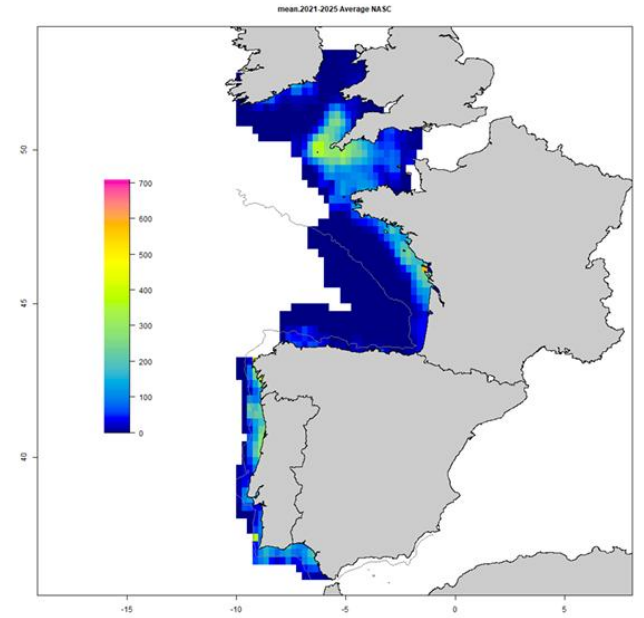


# Sardine in the Northeast Atlantic

- The species is considered to comprise of a number of genetically distinguishable sub-populations, sub-populations along the Cantabrian coast, within the Bay of Biscay and into the English Channel are currently assessed as three management units.

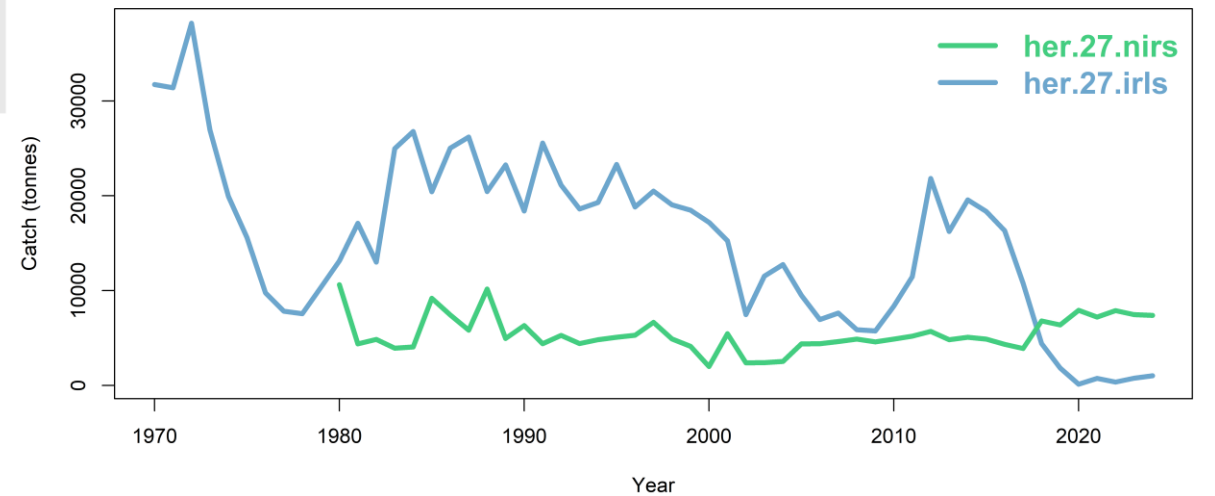
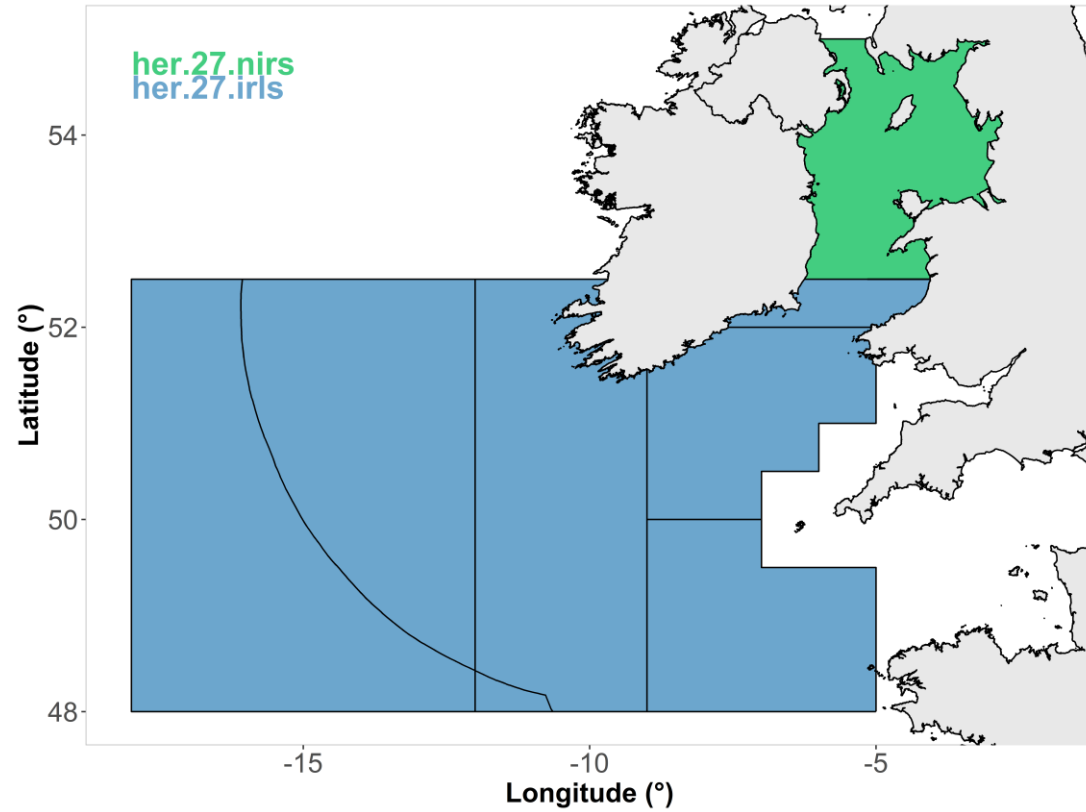


Time series of sardine catches by stock in the NE Atlantic.



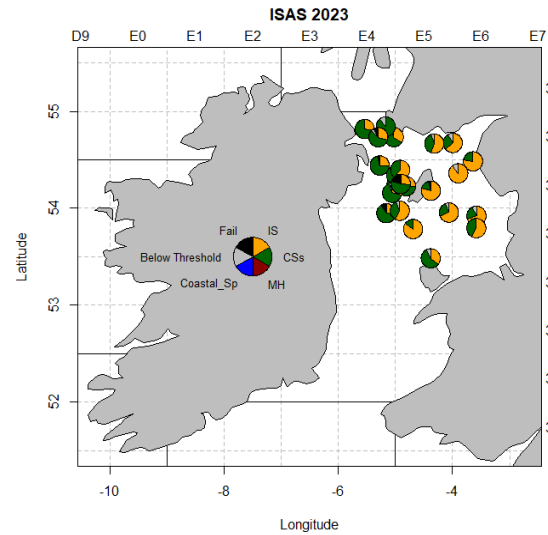
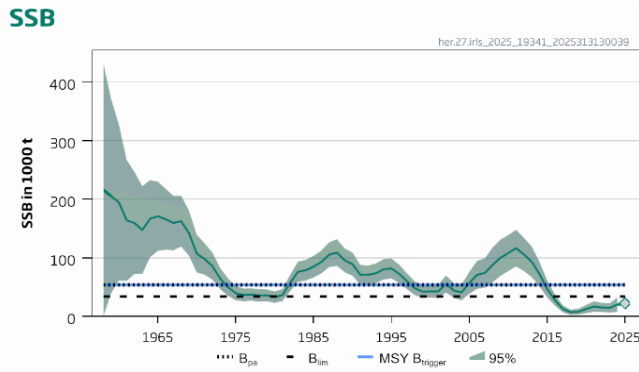
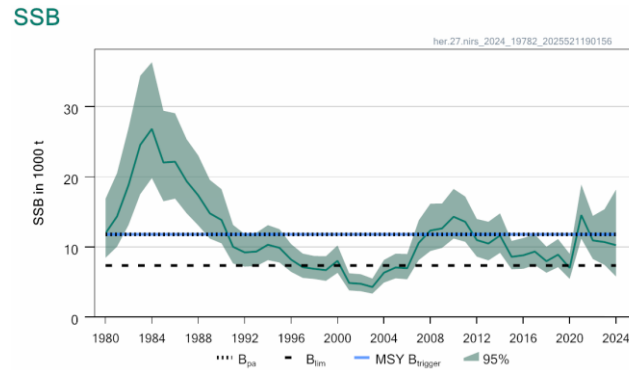
Average sardine NASC 2021-2025 in autumn.  
Extracted from WGACEGG report 2025

# Herring to the southwest of the British Isles (Celtic and Irish Seas)

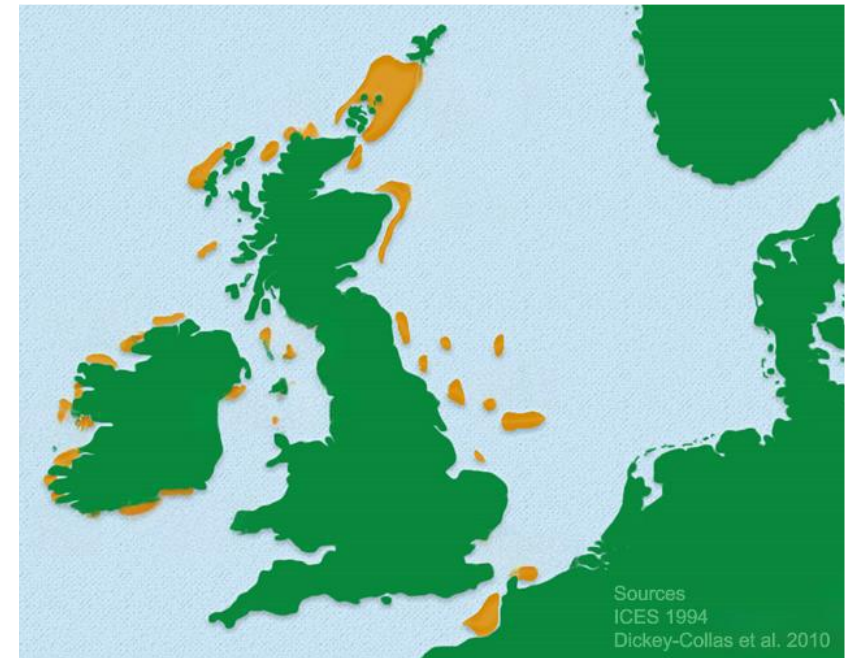


# Recent changes and potential effects on the established assessment and management regimes for both areas

- Reduced abundance of herring in the Celtic Sea and shifts between management units
  - Effects on the established management system
  - If CS fish start spawning in the IS which stock do they belong to? And how to deal with this.
  - Spring-spawners in Irish Sea on autumn spawning grounds. Where did these fish come from?

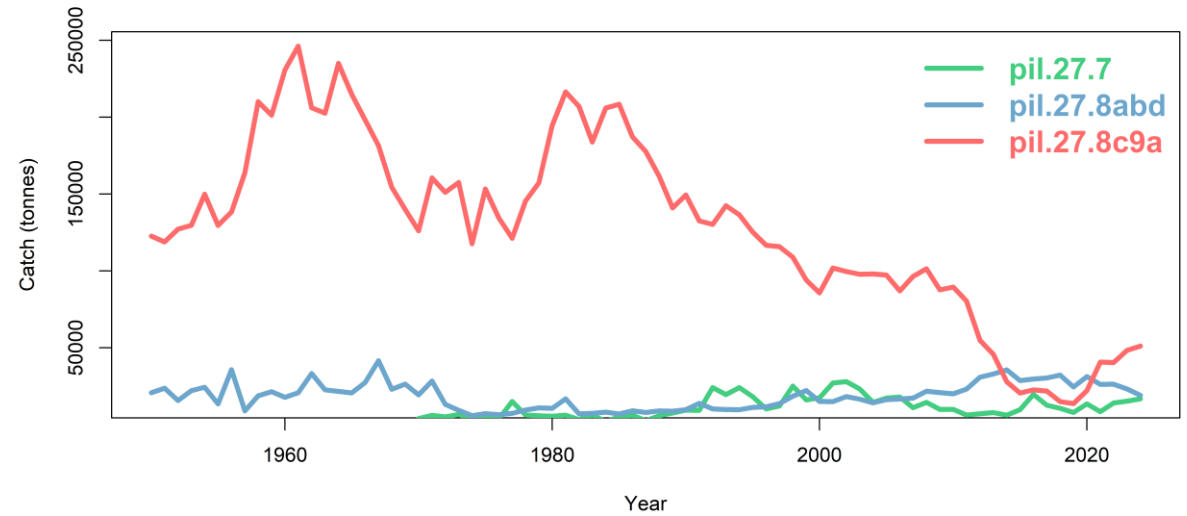
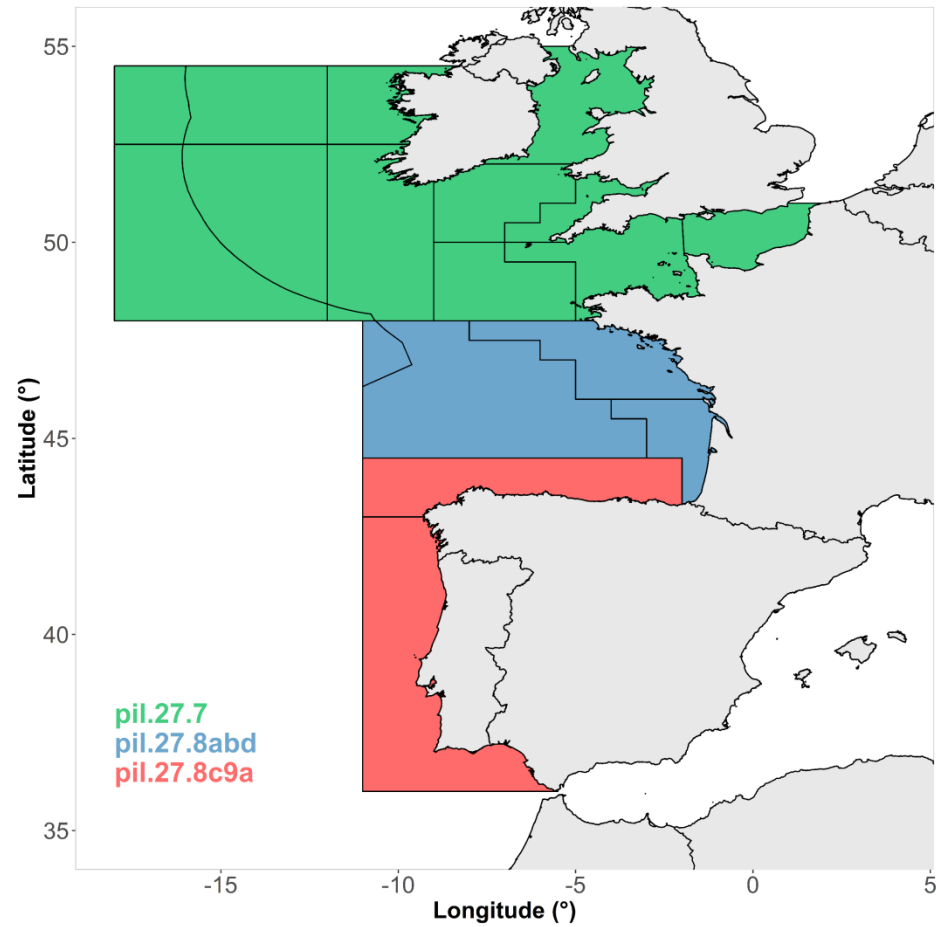


Genetically identified  
Celtic Sea/winter  
spawners in the Irish Sea



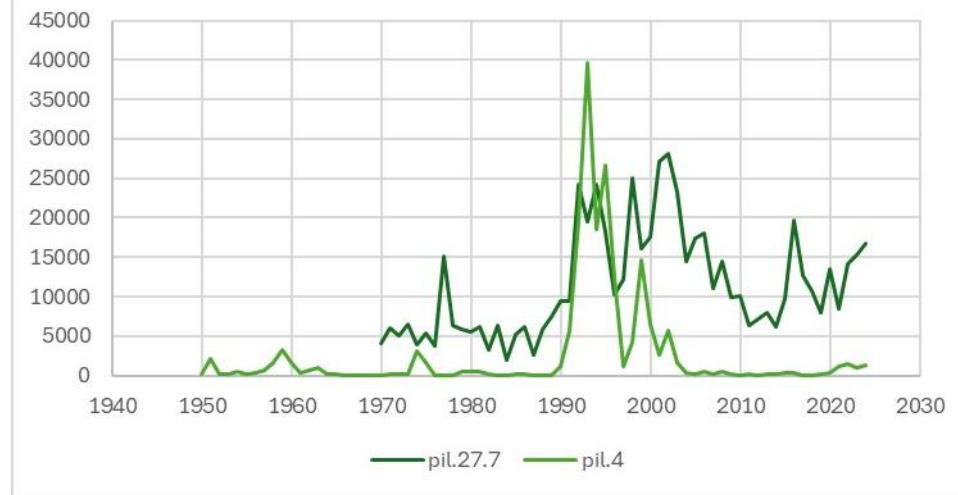
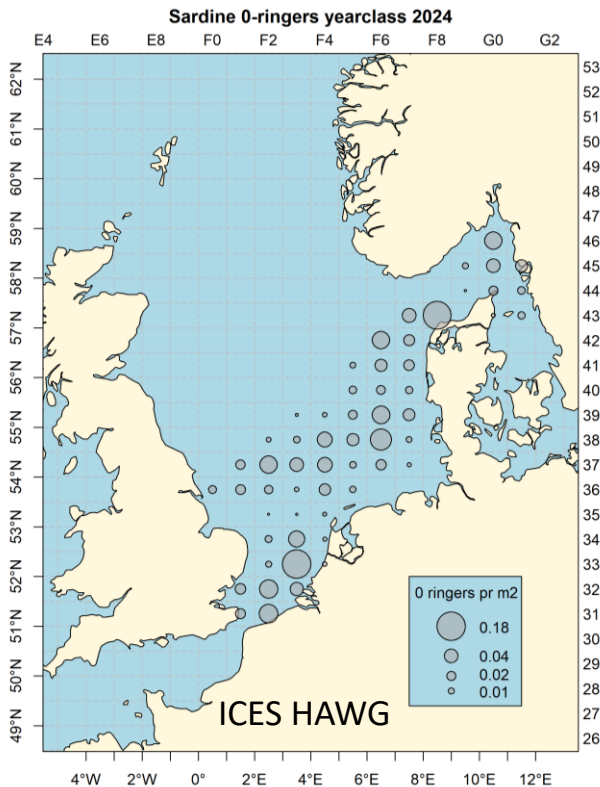
Herring spawning grounds around the  
British Isles

# Sardine to the south of the British Isles (Cantabrian, Celtic and North Seas)

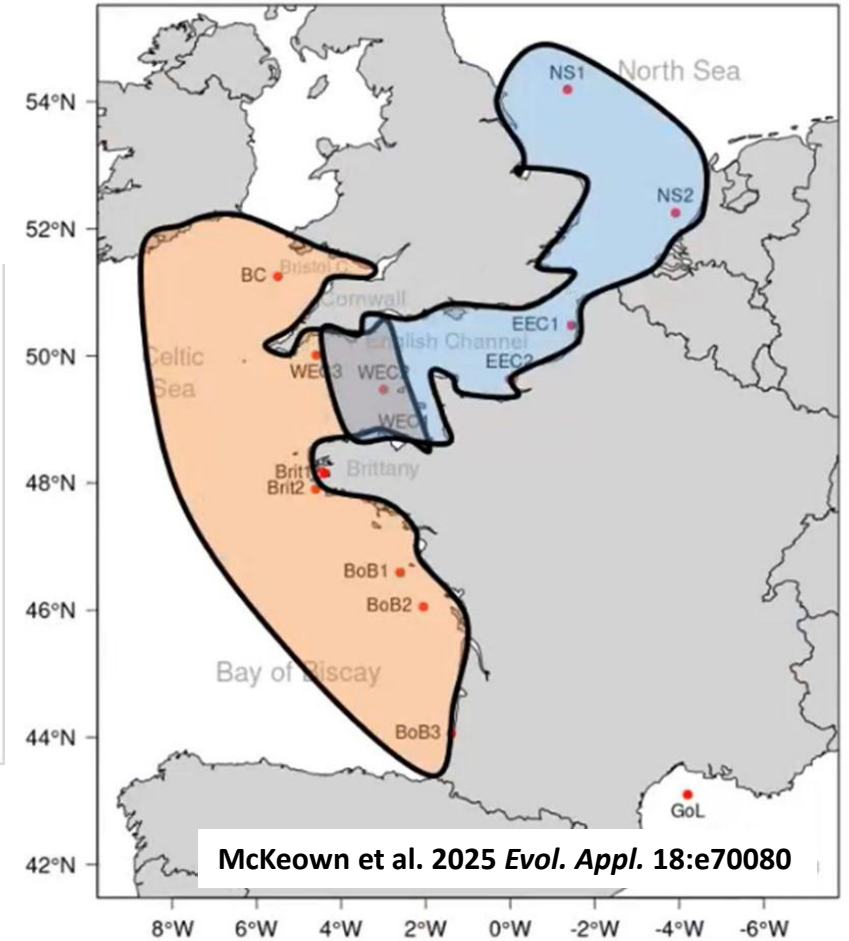


# Recent changes and potential considerations for the assessment and management regimes at the northern extension of the sardine distribution

- Increased abundance of sardine in northern areas
- Potential fishery, implementing an assessment plus advice, plus determination of assessment and management units – how to incorporate North Sea into potential future management and advice if a fishery opens



1. Survey data indicates an increase in sardine abundance in the North Sea
2. Commercial catch data (**pil4**) seems to present a different picture!



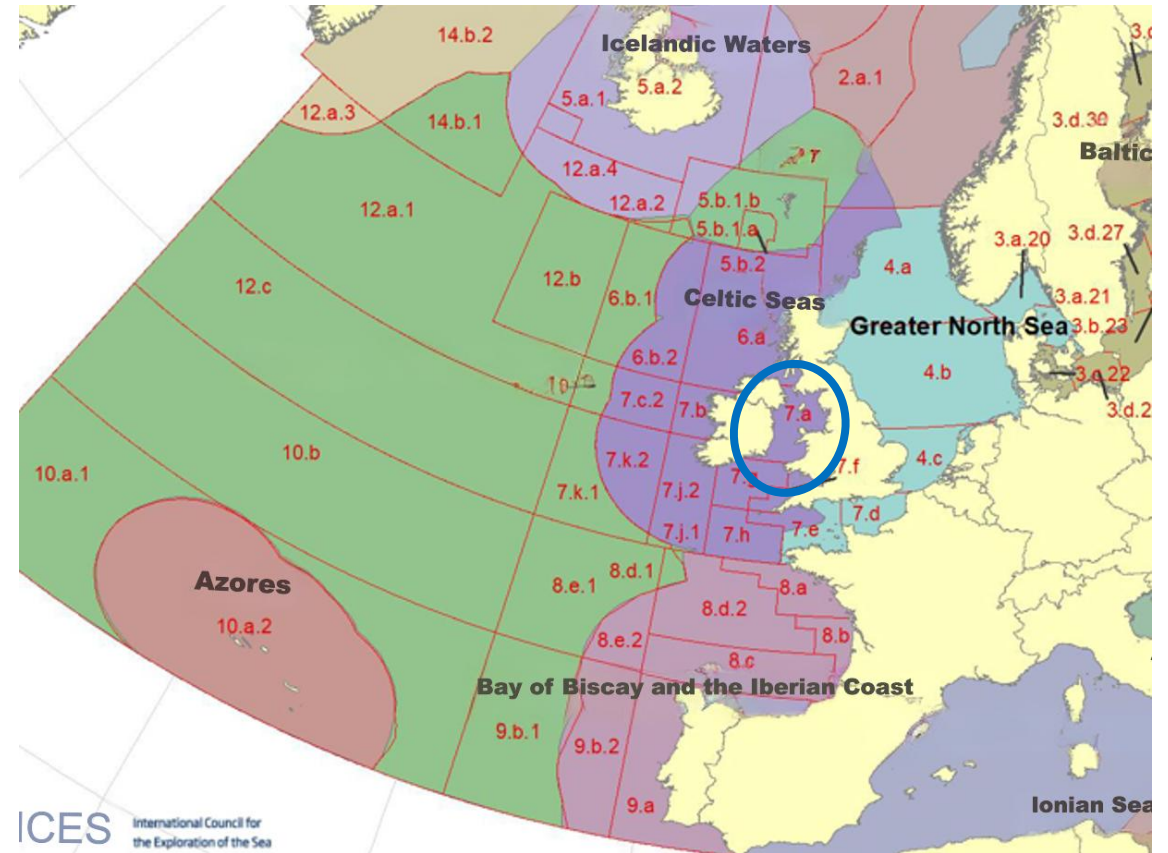
The current perception of sardine stocks from a genetic point of view.

# Conclusions and summary

## Herring

### Irish Sea/Celtic Sea

1. Well established assessment units and management areas.
2. Southern stock (Celtic Sea) very low with zero catch management advice.
3. Celtic Sea in the Irish Sea and in the IS fishery
4. Assessment in the IS includes both stocks.
5. Validity of the IS stock advice?
6. A new winter/spring spawning occurring in the Irish Sea
  - A. If CS fish remain in the IS and spawn there – which stock do they belong to?
  - B. Is there a necessity to redefine the assessment areas (stock boundaries) along with the management units?
  - C. Should the spring spawners be considered as part of the IS herring stock or a separate stock with its own assessment and advice?

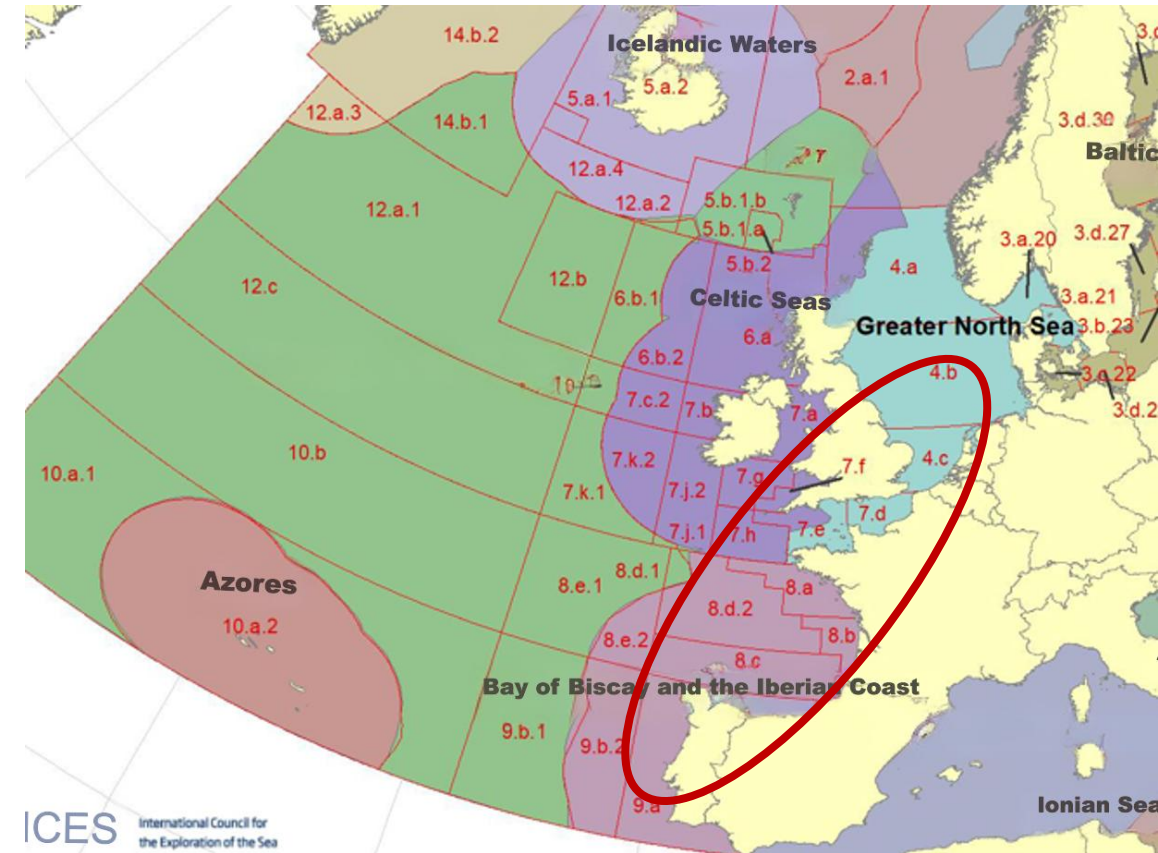


# Conclusions and summary

## *Sardine*

### Western European Shelf sardine

1. Current stock assessment and management considers 3 separate stocks.
  2. Recent genetic studies suggest two distinct 'stocks' which do not align with the status quo.
  3. Sardine abundance is increasing in the North Sea and is neither assessed nor assigned to a management area.
  4. Sardine in the Channel (Subarea 7) whilst assessed with an advised catch there are no management set quotas.
- A. Should the stock assessments and management areas be adjusted to align with the current genetic perception of the stocks?
- B. How should the North Sea area (a new area for consideration) be incorporated into the assessments and management?
- C. How often should changes in distribution and stock boundaries be incorporated into the assessment and management process?



# Thank you for listening

[richard.nash@cefas.gov.uk](mailto:richard.nash@cefas.gov.uk)

[aaron.brazier@cefas.gov.uk](mailto:aaron.brazier@cefas.gov.uk)

[rosana.ourens@cefas.gov.uk](mailto:rosana.ourens@cefas.gov.uk)

[susan.kenyon@cefas.gov.uk](mailto:susan.kenyon@cefas.gov.uk)

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