

# Seafish Common Language Group, December 2023

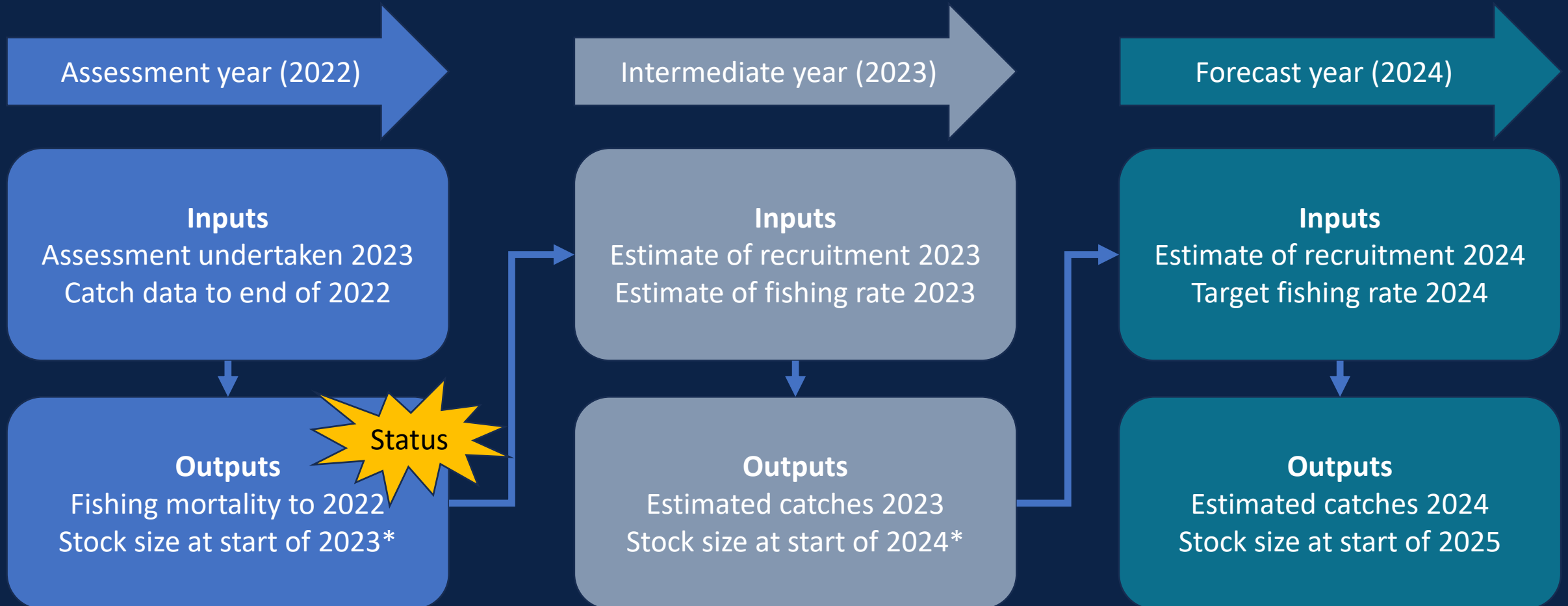
## Fish stock status in the North East Atlantic

(demersal, crustacean, benthic)

**Dr Ewen Bell, Senior Fisheries Advisor & UK ACOM member**



# Stock status year vs Advice year



# Continued development in assessment

Revision of stock boundary/definitions.

- *blonde ray 4bc7d (formerly 4c7d)*
- *Northern Shelf cod (Formerly separate 3a47d and 6a stocks, now a complex of 3 substocks)*

Greater use of ICES data limited framework:  
RFB, RB, CHR approaches.

*More stocks with MSY proxies for fishing mortality*

**Changes complicate comparison  
between years!**

- *More stocks with MSY proxies*
- *ICES classification on biomass proxies tighter (more “unknown” biomass)*

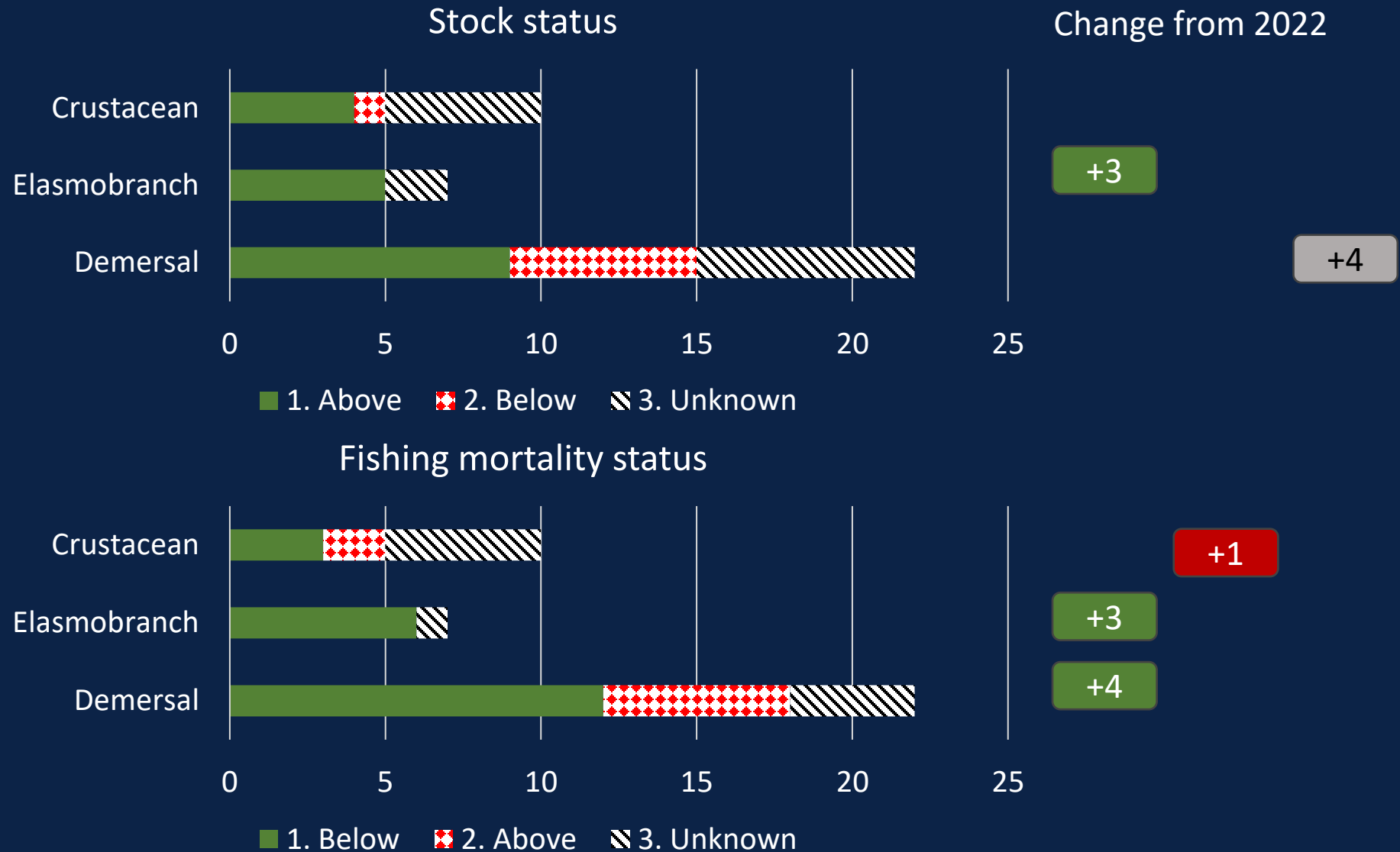
Benchmark system increasing the number of  
stocks assessed with SPiCT model.

*Brill 3a47de, Pollack 6-7, Thornback ray 3a47d, 8c,  
Spotted ray 3a47d, blonde rays 4bc7d*

# “North Sea” overview



To avoid double counting, straddling stocks allocated to one ecoregion. This interpretation will not match ICES products.

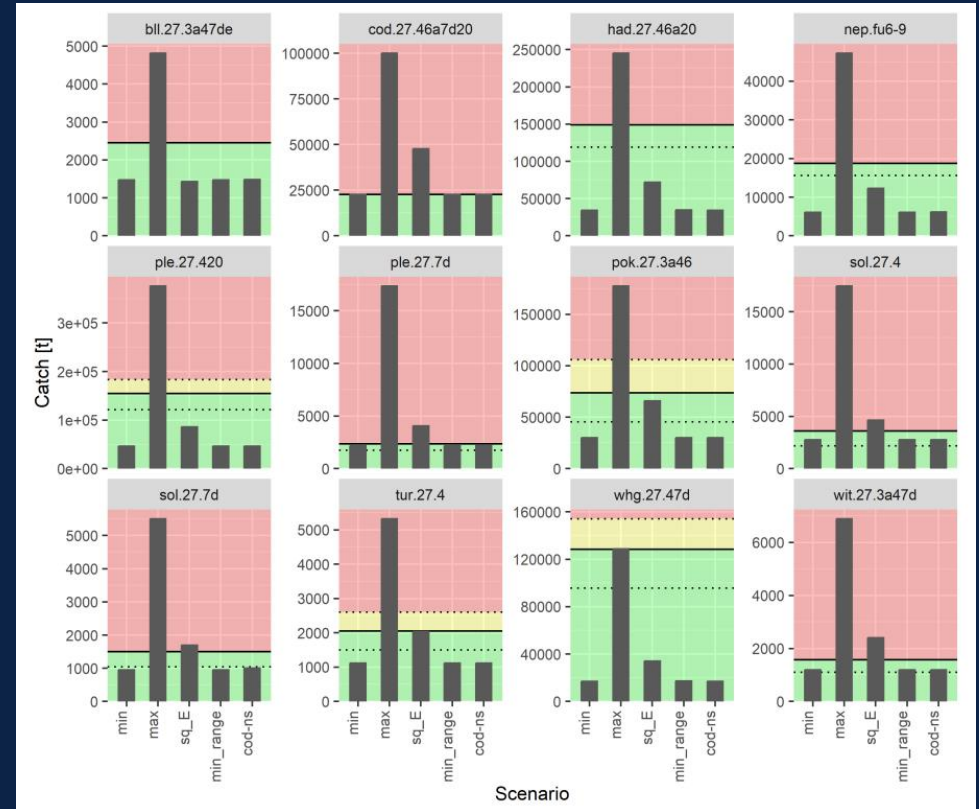




# North Sea advice

## Challenges for mixed fisheries

Advice change	
Cod	-13%
Haddock	18%
Whiting	17%
Saithe	25%
Plaice	3%
Sole	-60%
Brill	87%
Turbot	-16%
Witch	32%
Lemon Sole	-30%



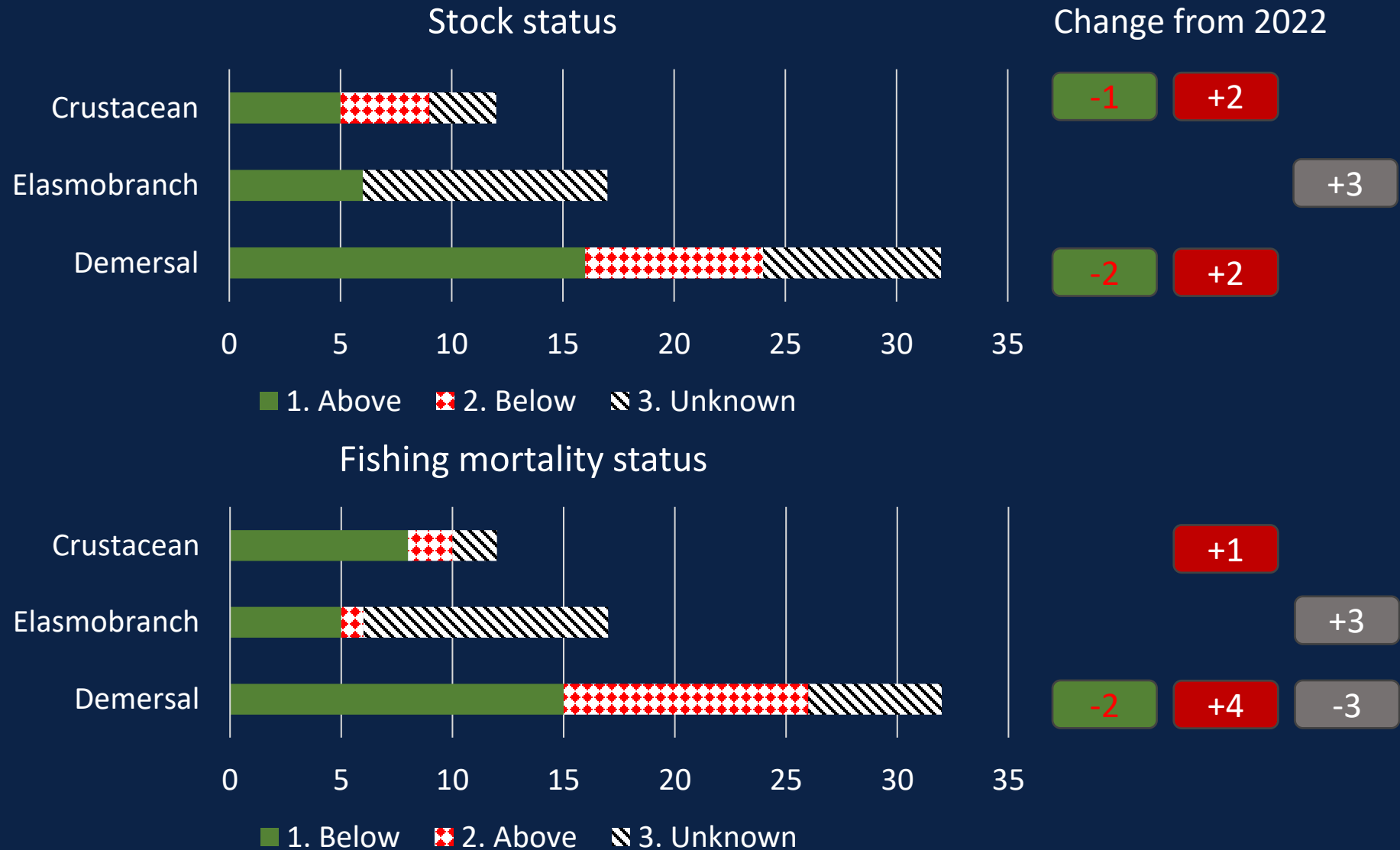
### Take home message:

- Achieving whiting advice risks overshoot of all others
- Restricting fishing to achieve cod advice undershoots all others

# "Celtic Seas" overview



To avoid double counting, straddling stocks allocated to one ecoregion. This interpretation will not match ICES products.



# Celtic seas advice – key points

## Increased advice

Anglerfish 7  
Boarfish 7  
Cuckoo ray 678ab  
Nephrops (net gain)

## Decreased advice

Haddock 7a  
Haddock 7e-k  
Sole 7e  
Sole 7h-k

## Zero catch advice

Cod 7e-k  
\*Whiting 7bce-k  
\*Pollack 6-7

Cod 7a  
Whiting 7a  
\*Sole 7a

# Northern Shelf cod #1

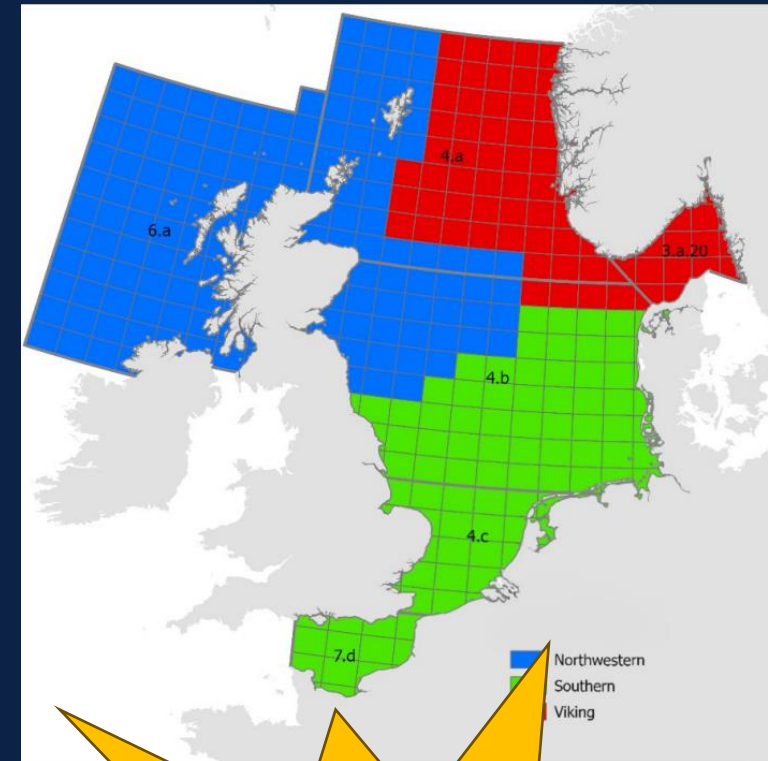
## Key developments

### Stock Identification workshop

- 2 genetic populations Viking and Dogger
- Dogger group shows different growth and maturity rates
- 3 sub-stocks: Viking, North West and Southern
- Mixing occurs, but the rates and extent are not well understood

### Benchmark New assessment framework

- Assessment model assumes sub-stocks isolated at spawning (Q1)
- Remainder of the year mixing assumed.
  - Common inputs e.g.
  - age-distribution
  - discard rates



Sub-stock  
separation  
**at spawning time**

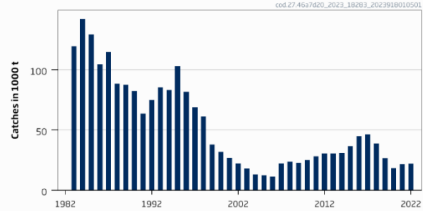


# Northern Shelf cod # 2

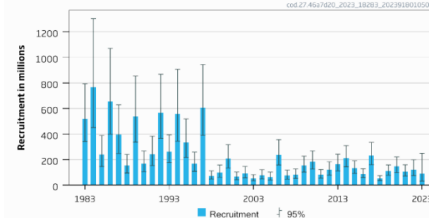
## Assessment results

### Northwestern substock

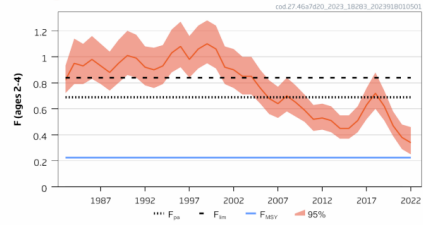
#### Model Estimated Catches



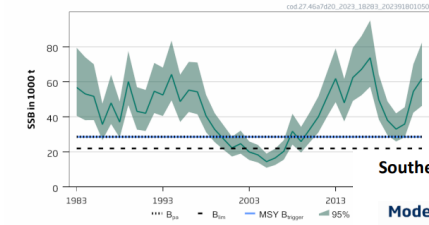
#### Recruitment (age 1)



#### Fishing Pressure

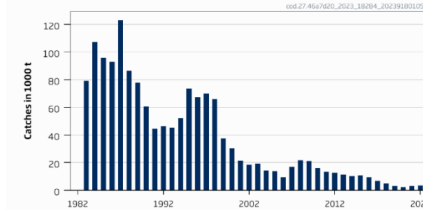


#### SSB

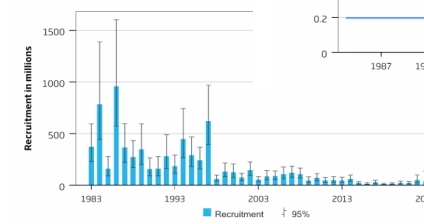


### Southern substock

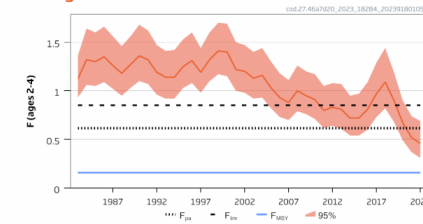
#### Model Estimated Catches



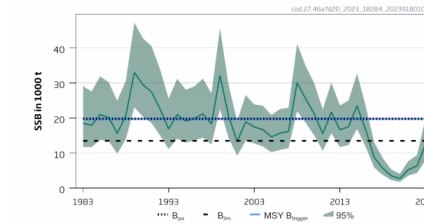
#### Recruitment (age 1)



#### Fishing Pressure

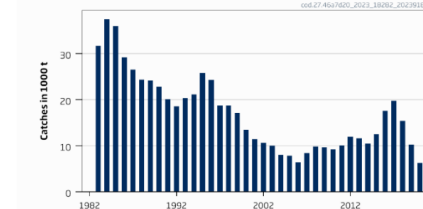


#### SSB

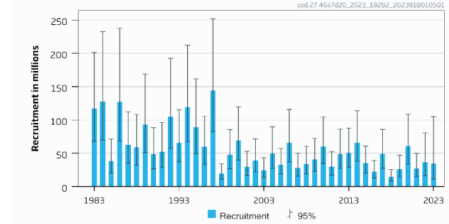


### Viking substock

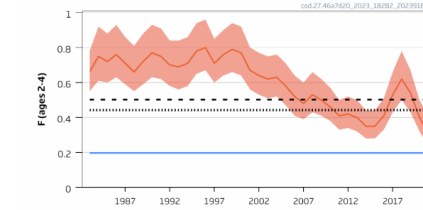
#### Model Estimated Catches



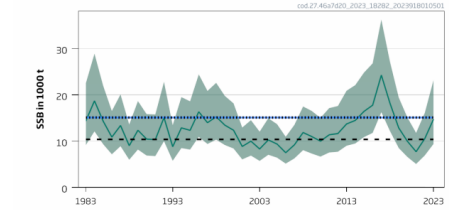
#### Recruitment (age 1)



#### Fishing Pressure



#### SSB



Some common features in trends for:

- Fishing pressure
- Recruitment

All sub-stock  $F_s$  above  $F_{msy}$

- NW sub-stock  $> MSY_{Btrigger}$
- Viking sub-stock between  $MSY_{Btrigger}$  &  $B_{lim}$
- Southern sub-stock  $< B_{lim}$

Recruitment of Southern sub-stock remains low

# Northern Shelf cod # 3

## Advice

### Generation process



- Catch forecasts made for each sub-stock ( $F_{msy}$  and other target  $F_s$ )
- Assumes catches can be taken independently
- Very little information on mixing
- Catch per sub-stock estimated by model (not input)

- ICES advice needs to be internally consistent with its Precautionary Approach.
- Impossible to evaluate whether technically possible to simultaneously achieve independent MSY tonnages.

- **Headline advice tonnage for whole stock unit – the sum of**
  - **MSY approach tonnage for Southern sub-stock**
  - **Northwest and Viking tonnages constrained by cut in  $F$  required for Southern**

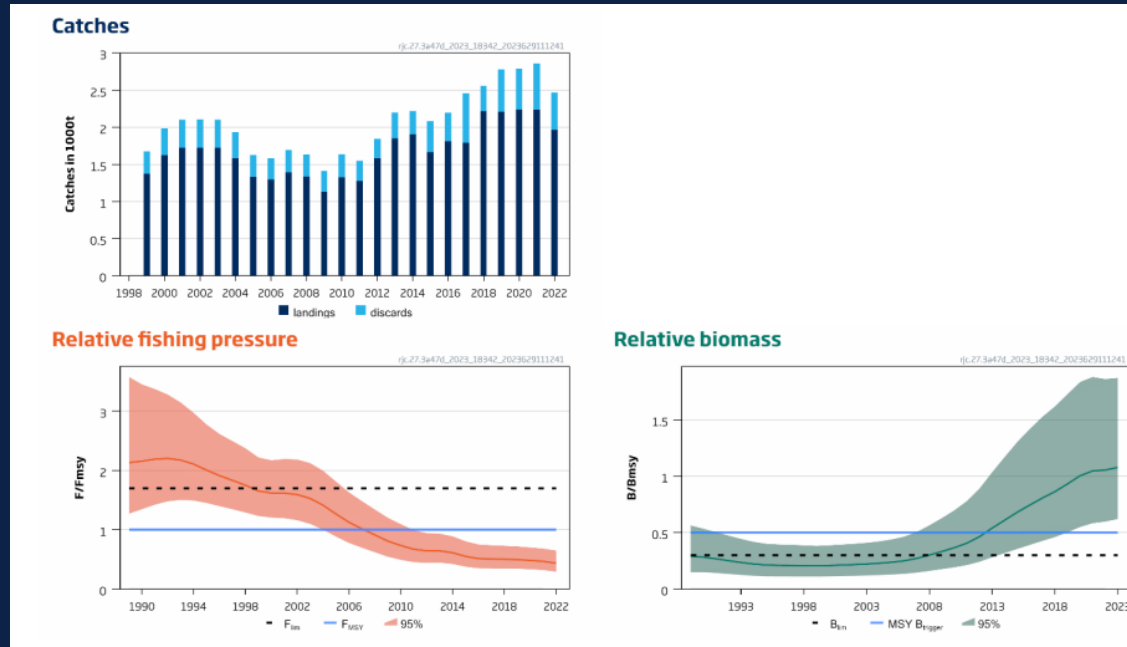
# Thornback ray

North Sea, Skagerrak, Kattegat, and eastern English Channel

## Increased advice – another challenge of implementation

New SPiCT assessment applied.

- Low fishing mortality
- biomass  $\sim B_{msy}$
- Advice +116%
- Advice for dead catch
- Discarding  $\sim 40\%$  of which  $\sim 65\%$  survives



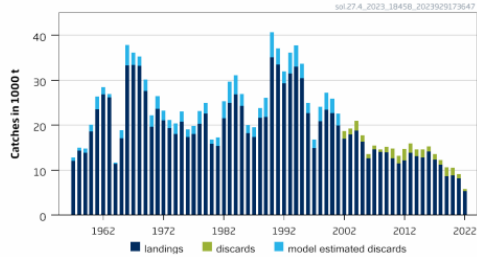
Challenge for management:

- How to interpret dead-catch advice
- Will discard rate change if quota increases?
- Part of mixed-species TAC

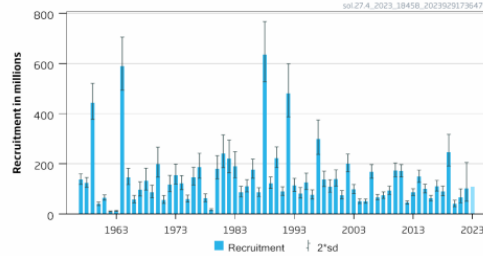
# North Sea sole

## A “retrospective” problem

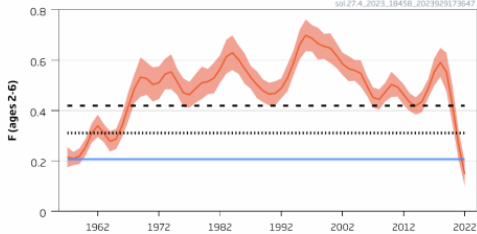
Catches



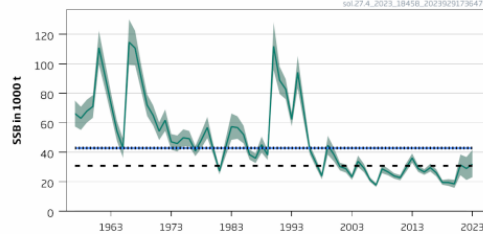
Recruitment (age 1)



Fishing pressure



Spawning Stock Biomass

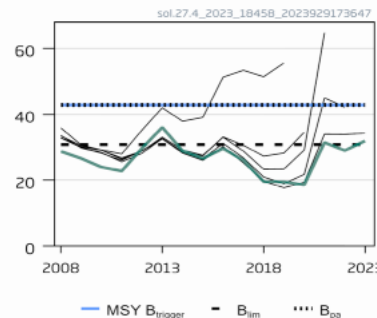


- SSB close to  $B_{lim}$
- Low recruitment 2020 & 2021
- $F > F_{msy}$  until 2021

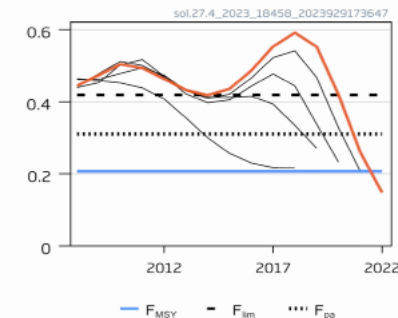
Assessment gets sees rescaling each year in same direction  
“Retrospective bias”

Where bias > threshold, advice adjusted.

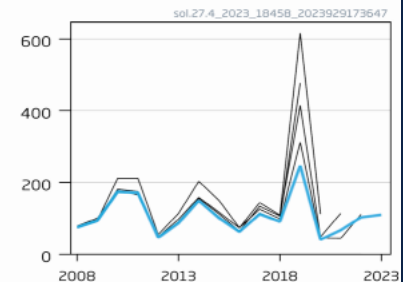
SSB (1000t)



F(ages 2-6)



Rec (age 1; Millions)



# Pollack 6-7

Benchmark moved assessment method  
Depletion Corrected Average Catch (catch data only)  
to  
SPiCT (which includes catch and survey data)

$$\text{Stock} < B_{\text{lim}} \text{ and } F > F_{\text{msy}}$$

Catches: Assessment only uses commercial but recreational  
potentially large portion of total catch

Advice robust to uncertainty around recreational catch

*Note a discrepancy between the WG report and the final advice*

*Expert group departed from the benchmark in the WG report*

*ACOM-approved benchmark reinstated for the advice*

Survey catches dropped >80% since 2006

Most Pollack caught around structures  
Trawl survey operates on open ground, but still  
considered indicative that stock in substantial decline

