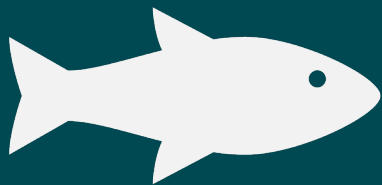


Are we jumping the gun on stock recovery in the Baltic Sea?

Christopher Griffiths

E: christopher.griffiths@slu.se



Biomass
(SSB)



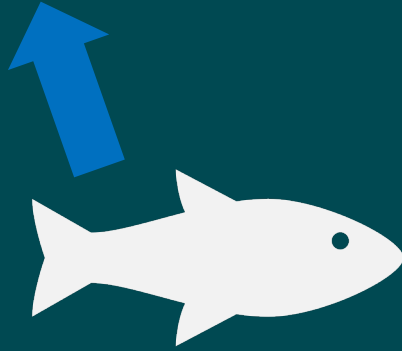
Demography
(age structure)



Time

CFP

Scientific advice/Rebuilding



Biomass
(SSB)



Demography
(age structure)



Time

MSFD D3C3

Reference points (RPs)

F_{MSY} & B_{MSY}

Target RPs = aim of long term management plan

Trigger or threshold RPs = should trigger management action

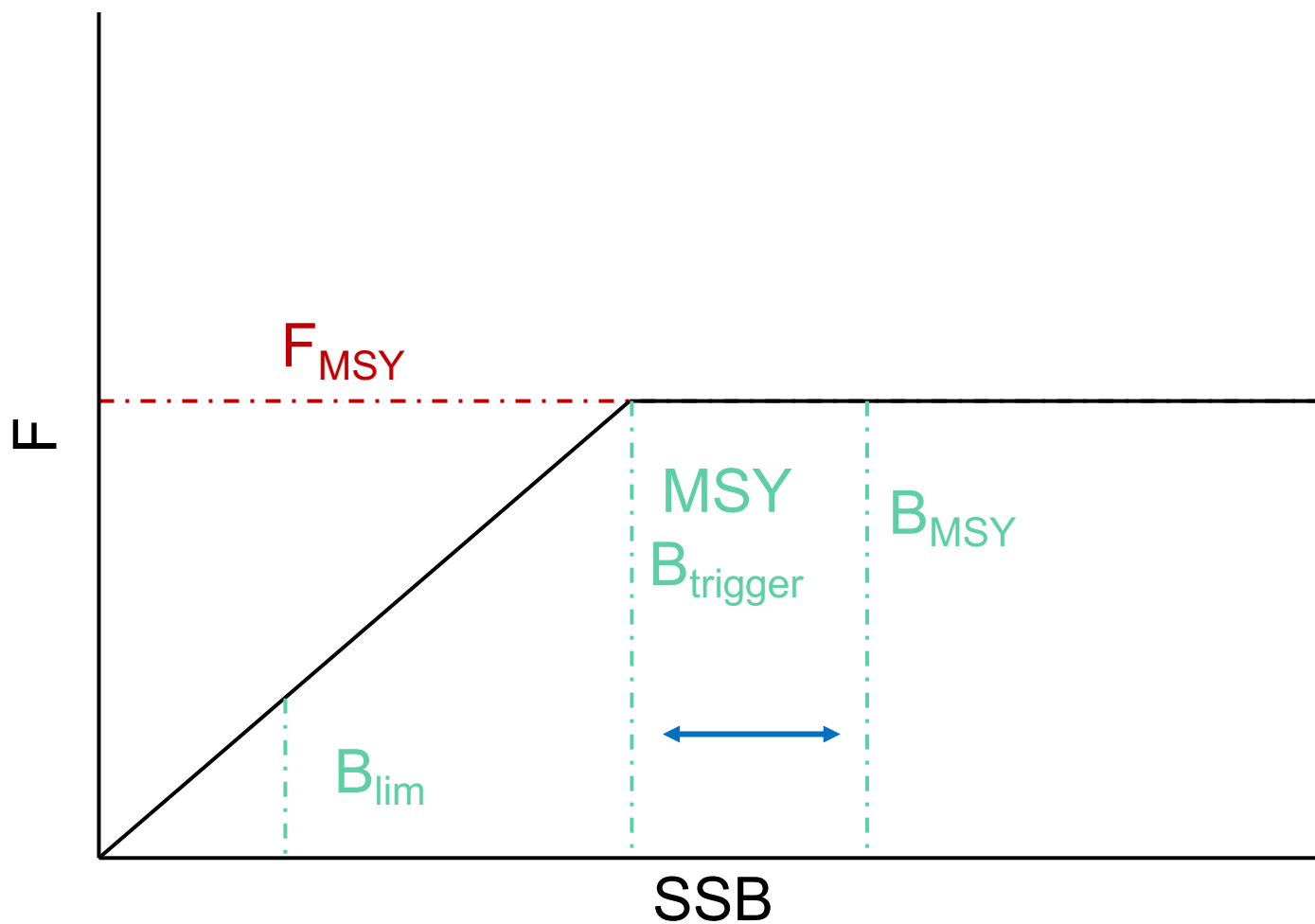
Limit RPs = should be avoided (impaired productivity)

B_{lim}

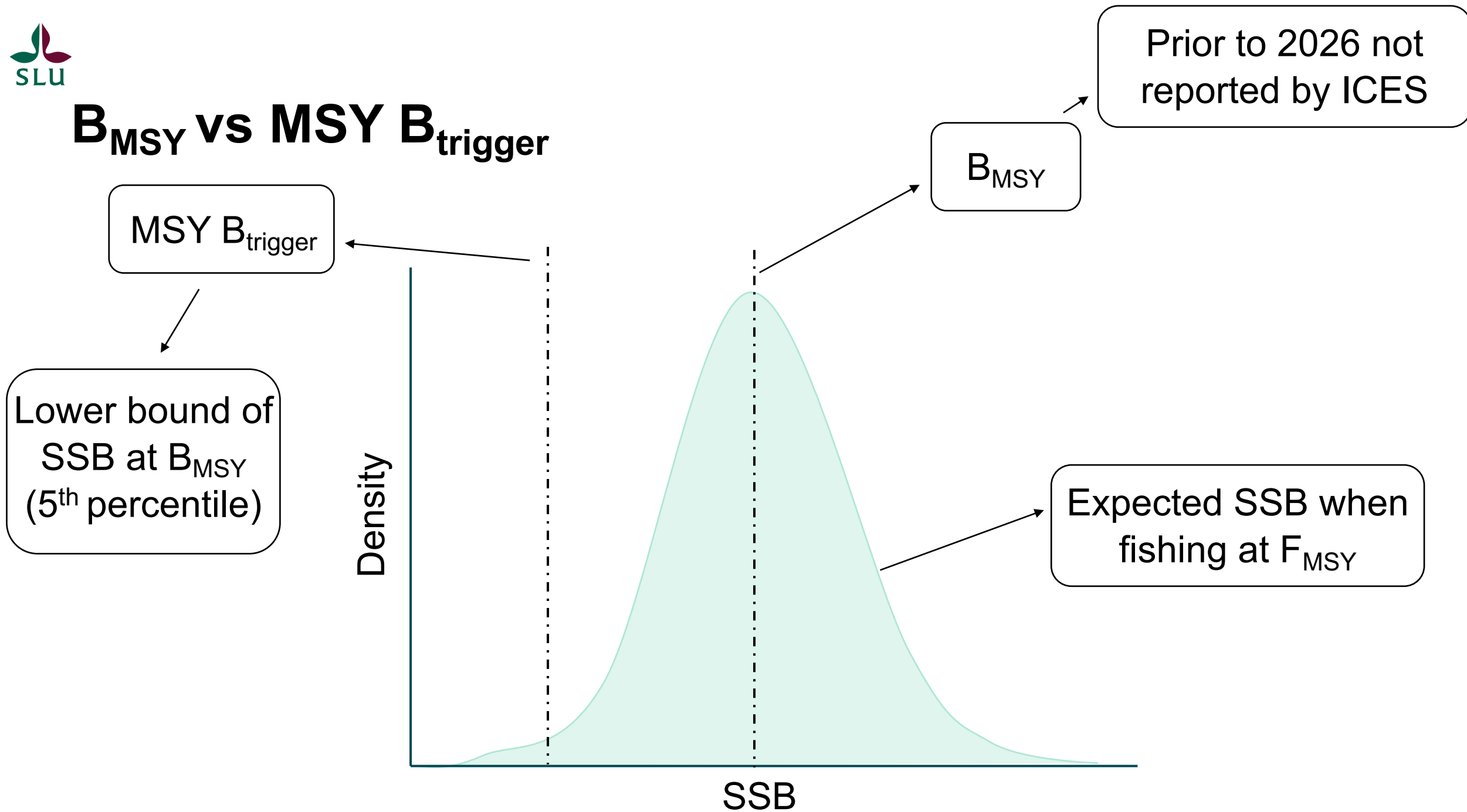
MSY $B_{trigger}$

ICES HCR

Used to give catch advice based on current stock status (SSB/MSY B_{trigger})



B_{MSY} vs $MSY B_{trigger}$



B_{MSY} vs $MSY B_{trigger}$

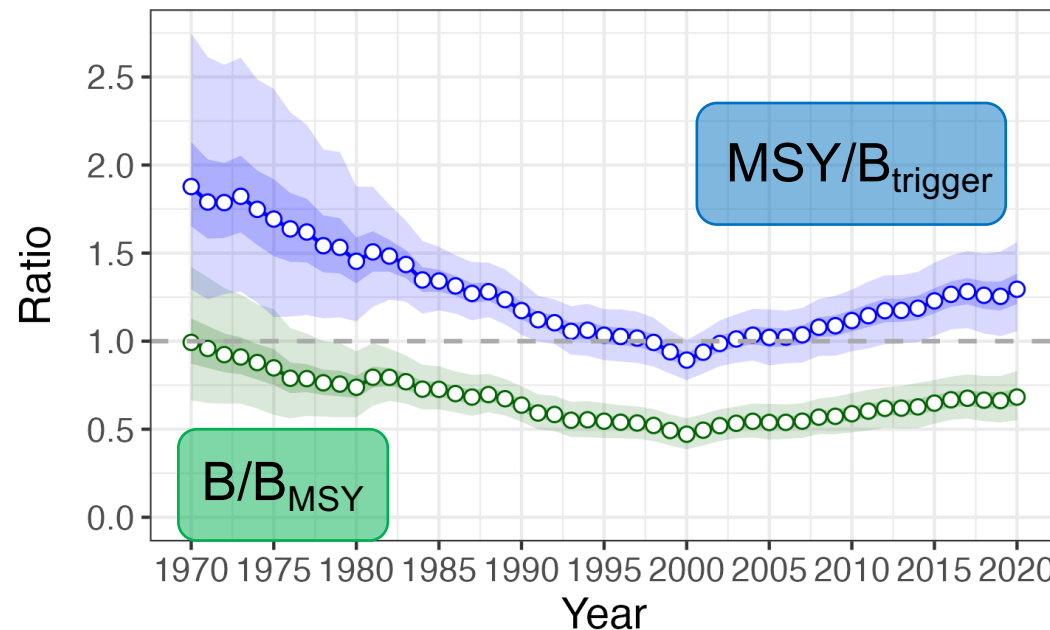
73 stocks in the NE Atlantic

All Category 1 stocks

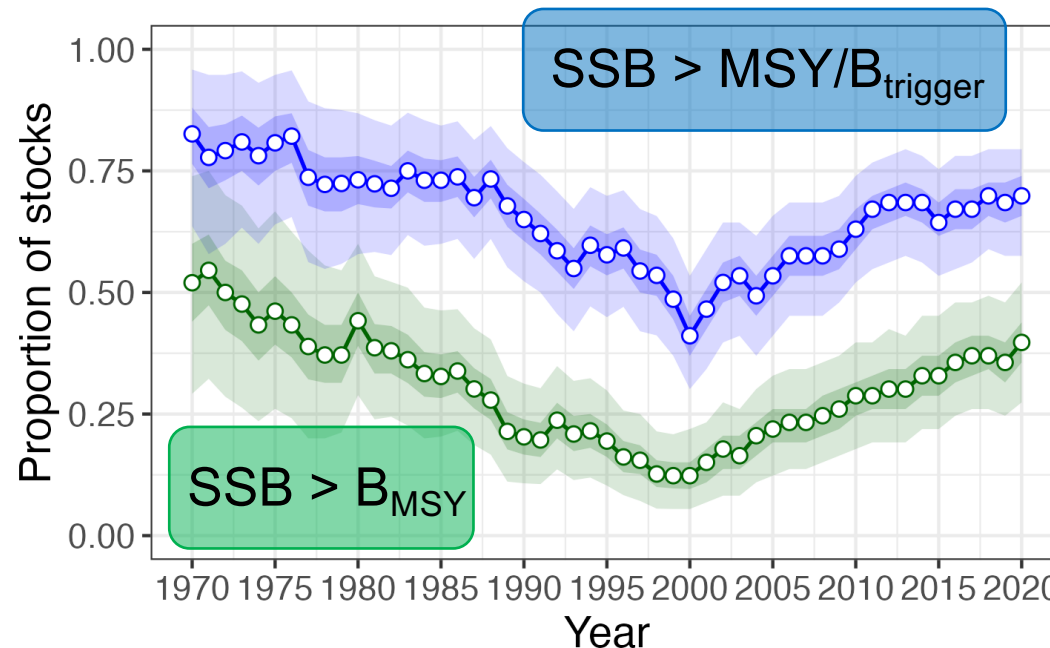
$MSY B_{trigger}$ from ICES

B_{MSY} estimated using the same methods used to estimate F_{MSY}

Combined using *JARA*



1.29
VS
0.68



0.70
VS
0.40

B_{MSY} vs $MSY B_{trigger}$

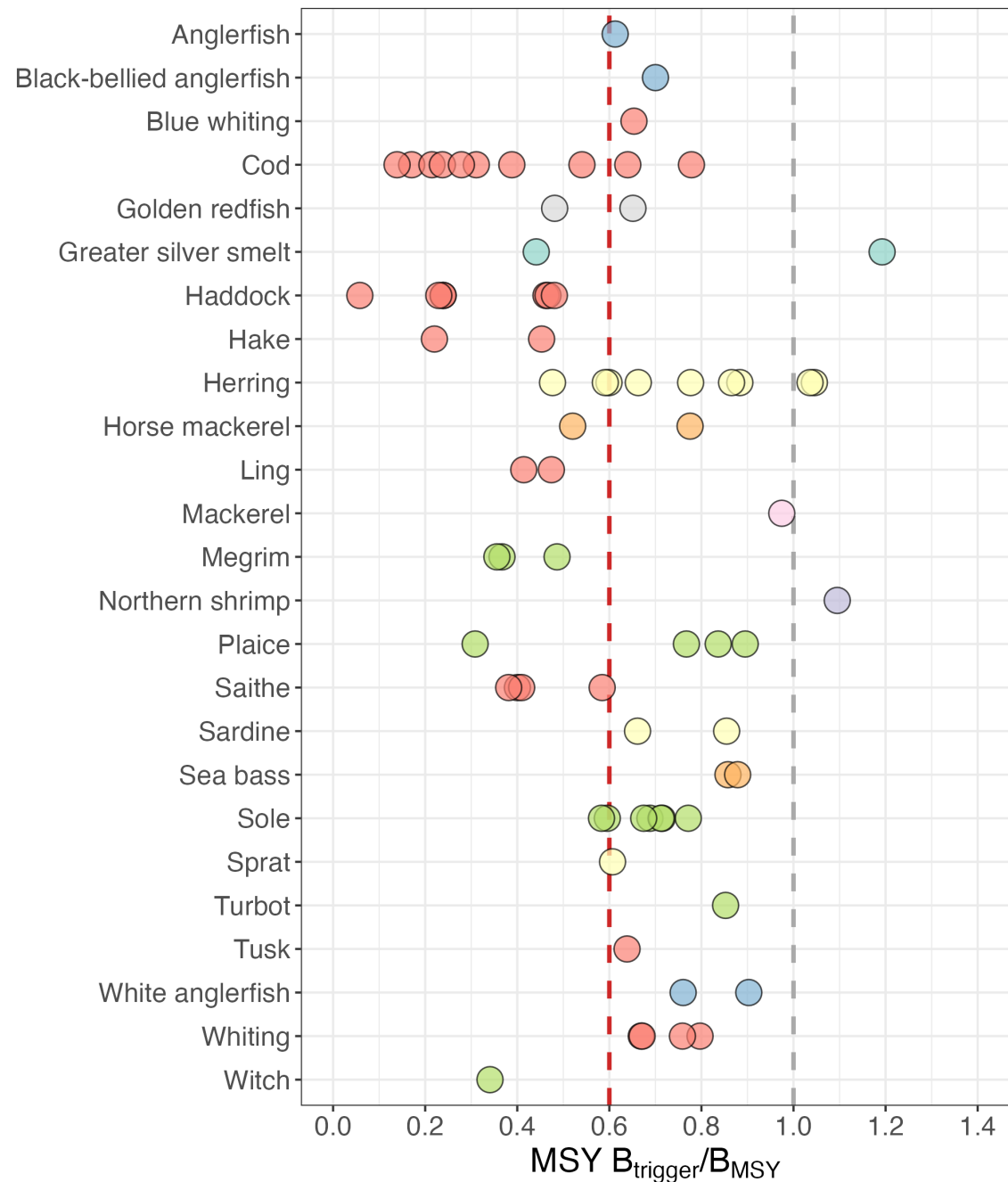
$$MSY B_{trigger} \neq B_{MSY}$$

$$MSY B_{trigger} = \sim 60\% \text{ of } B_{MSY}$$

Varies between 5% and 120%

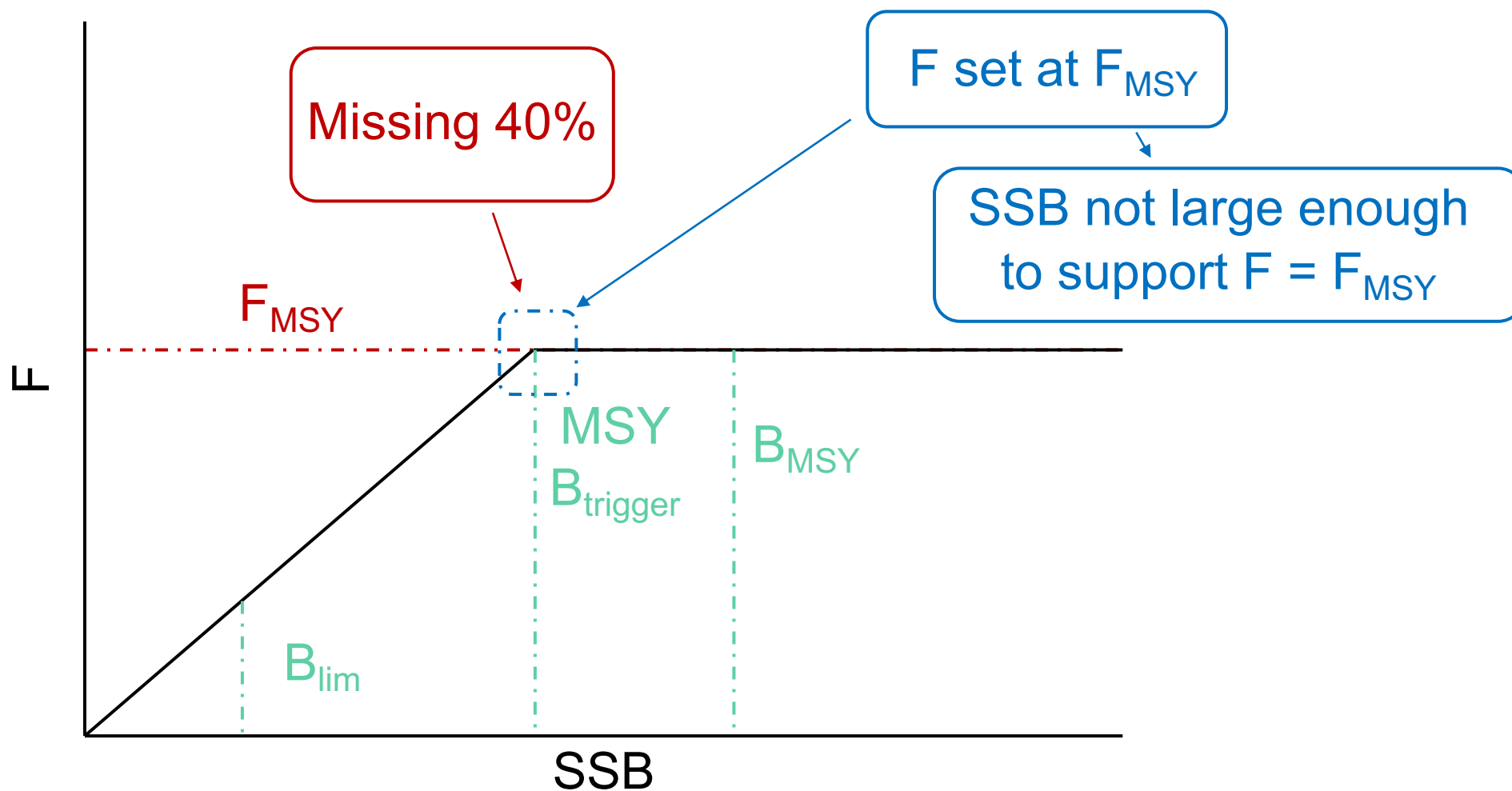
7 stocks in the Baltic Sea

Cod (24%), herring (80%), sprat (60%), plaice (31%) and sole (69%)



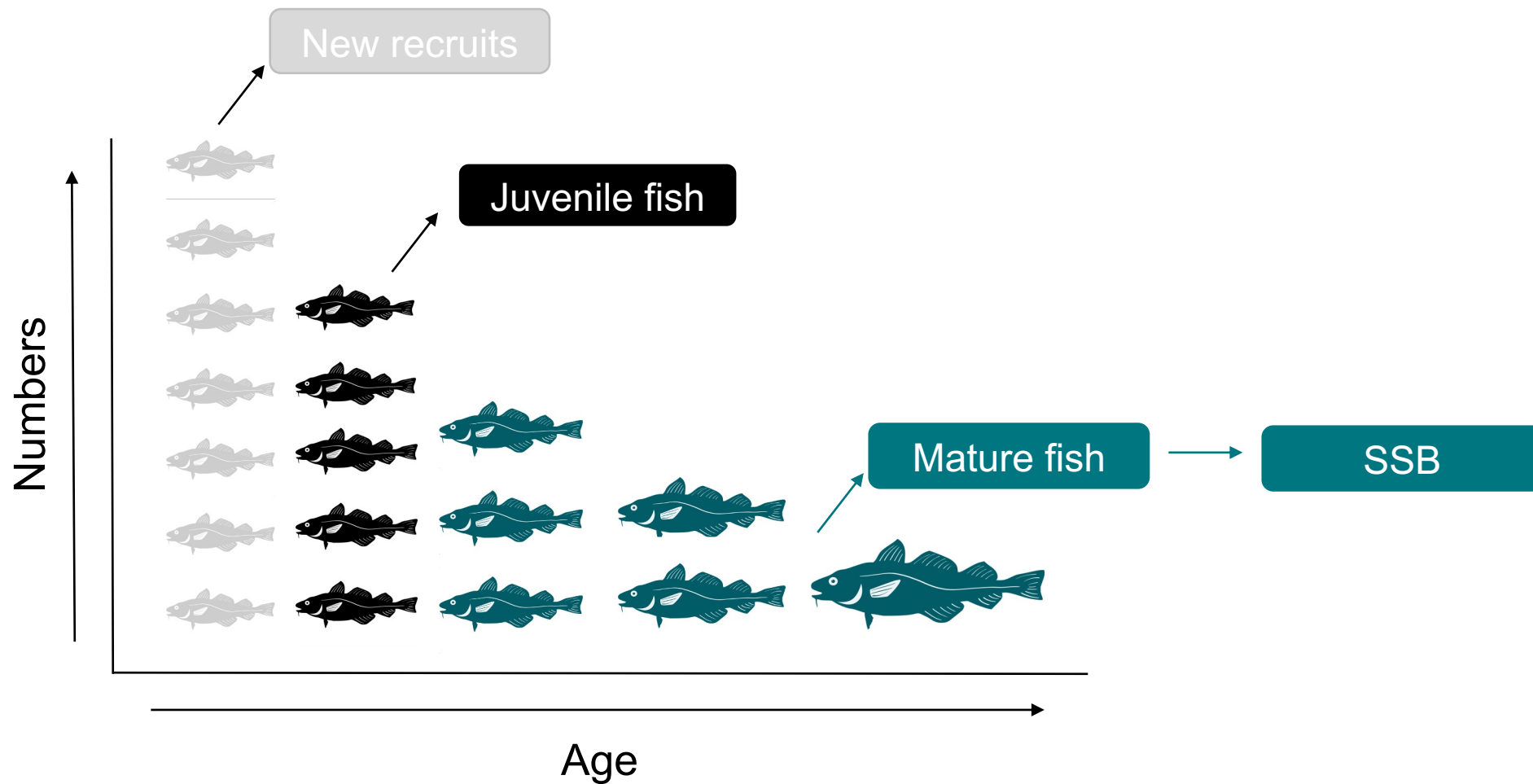
Used to give catch advice based on current stock status (SSB/MSY B_{trigger})

B_{MSY} vs MSY B_{trigger}

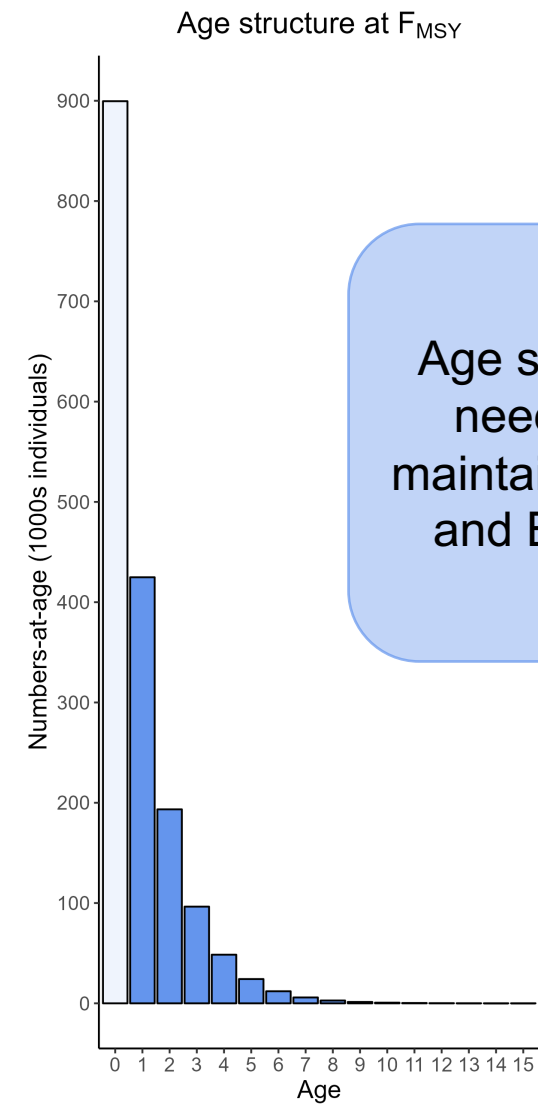
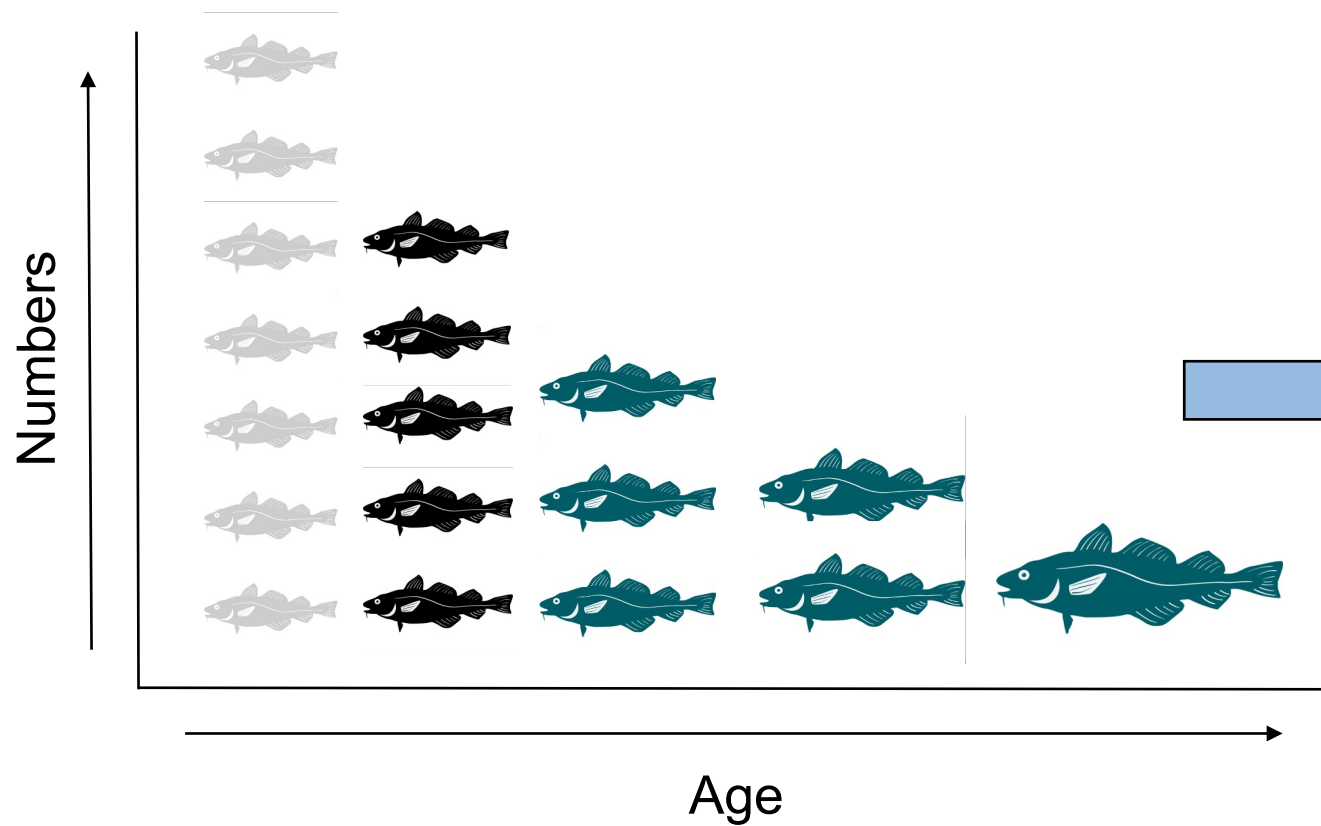


Age structure

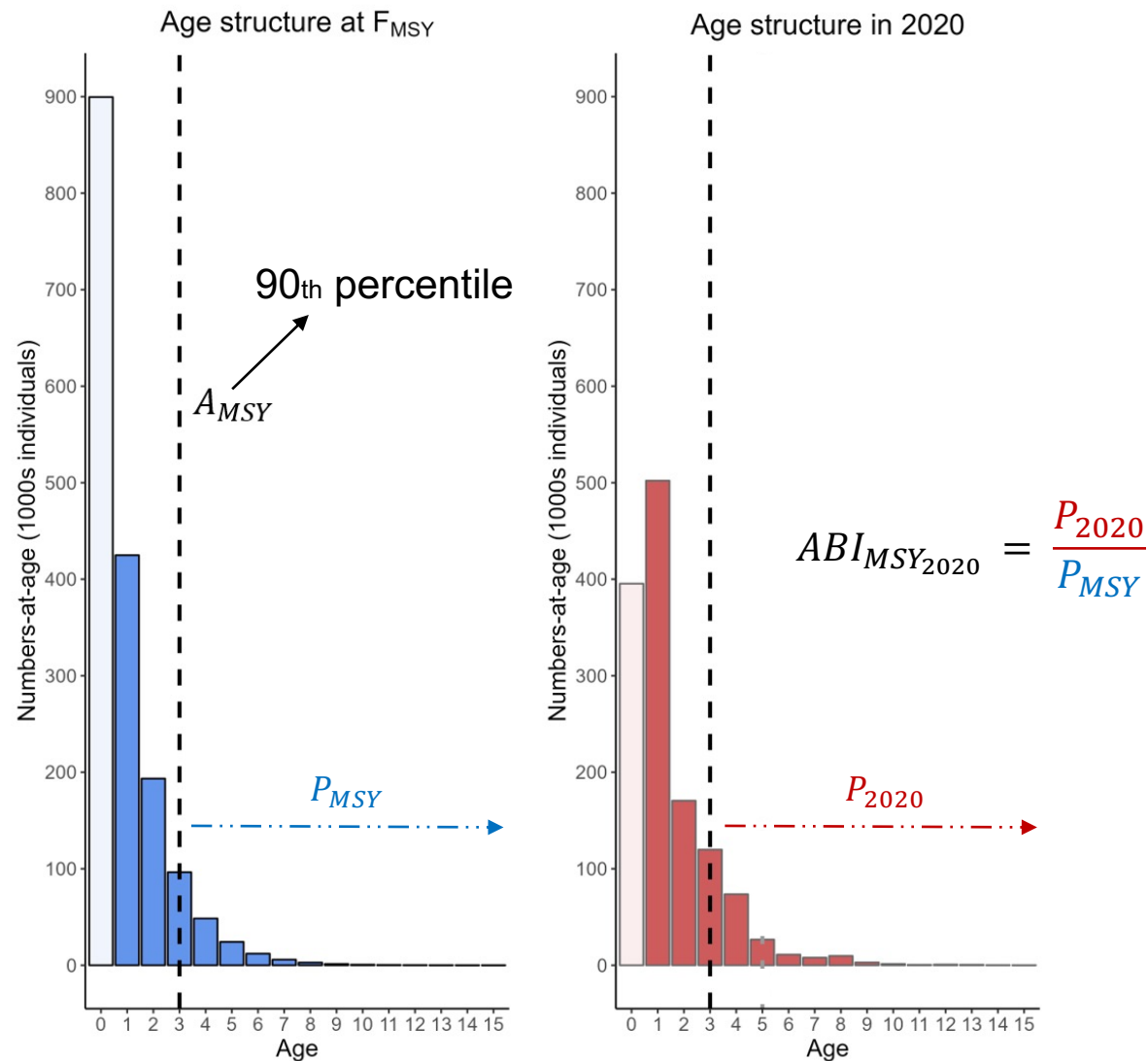
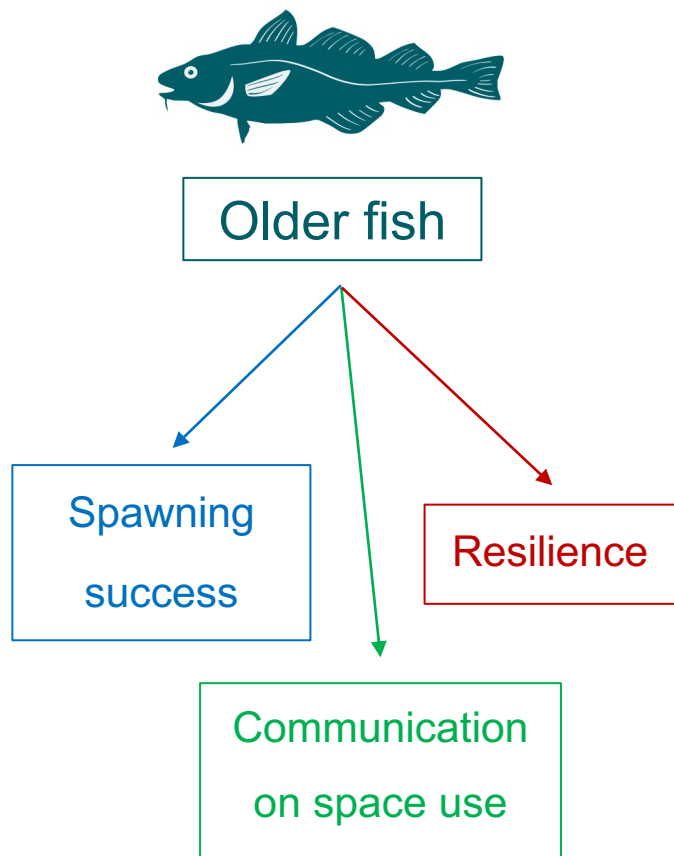
Almost all ICES
Category 1 stocks



Age structure



Calculating ABl_{MSY}



ABI_{MSY}

Current status:

45 stocks - ABI_{MSY} < 1 (62%)

27 stocks - ABI_{MSY} > 1 (38%)

22 stocks - ABI_{MSY} < 0.5 (31%)

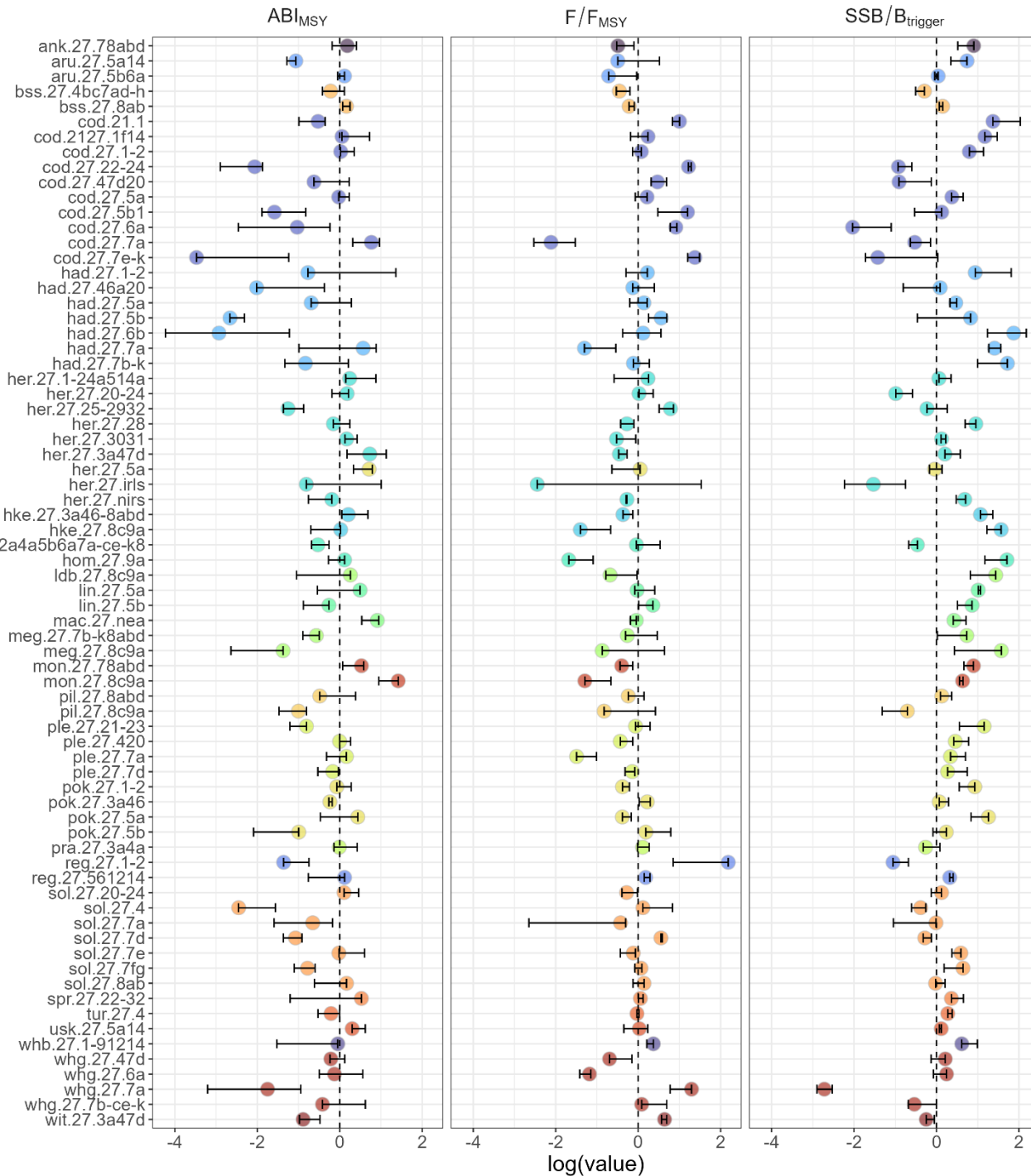


Most recent ABI_{MSY} value



Range of ABI_{MSY} values
over the last 5 years

Stock ID



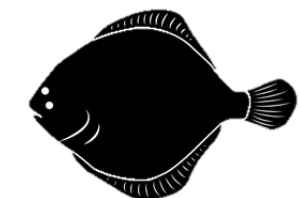
ABI_{MSY}

79%

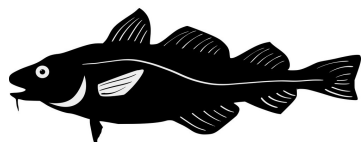
50%



ABI_{MSY} < 1



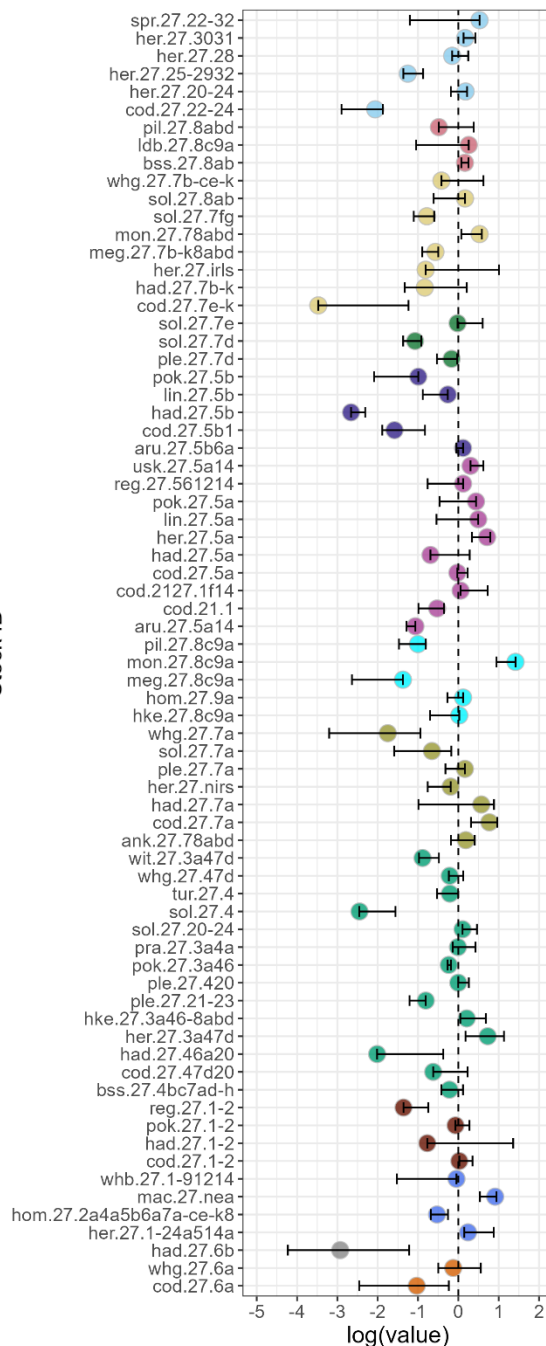
80%



75%

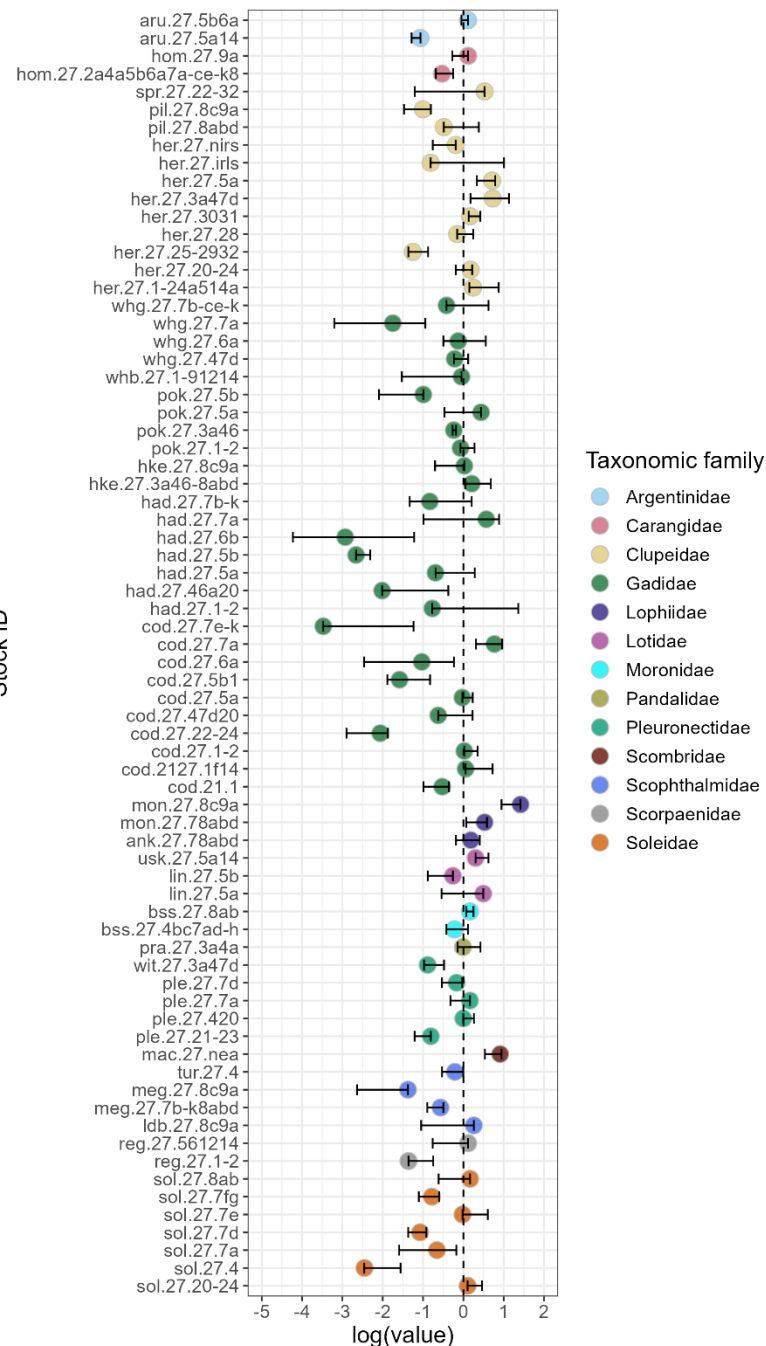
A

Stock ID



B

Stock ID

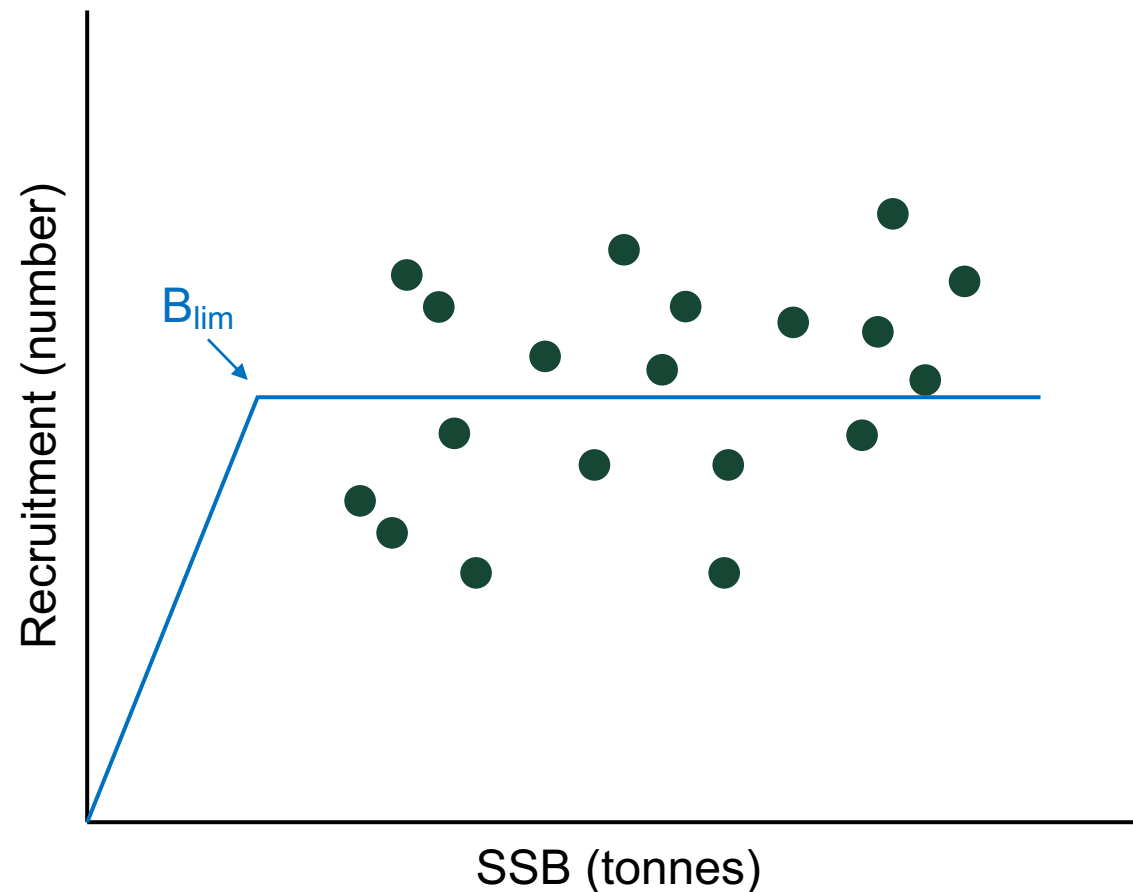


B_{lim} – limit reference point

B_{lim} – often based on assumed recruitment impairment

Often not observed in well managed fisheries

Might be estimated, based on lowest observed SSB or a fraction of B_0

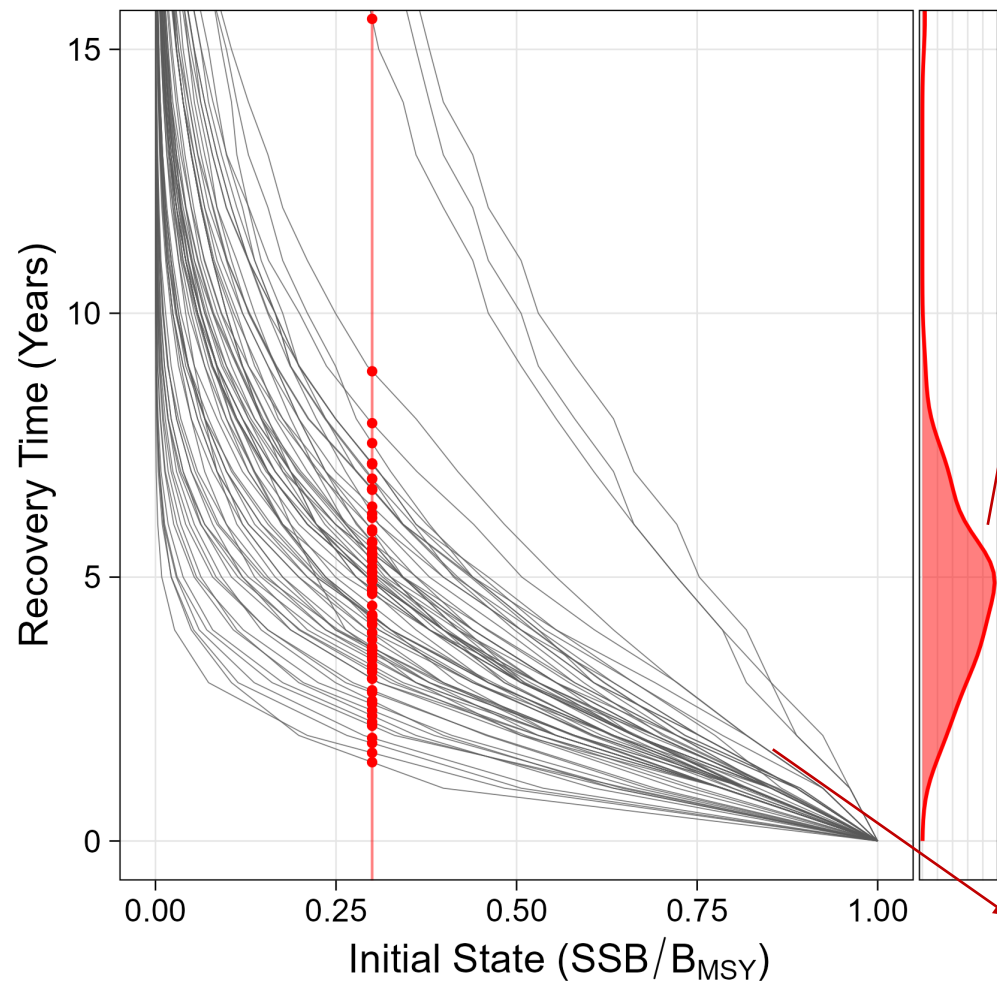


B_{lim} – limit reference point

What if we did it differently?

$B_{rebuild}$ = lowest biomass from which a stock can reach B_{target} within an **agreed time** horizon (years or generation time) and an **agreed F**

$T_{rebuild}$ = time to B_{target} based on current state (**tracker**)



5 years
1 generation

82 stocks
 $F=0$

Questions

Age-structure work – <https://doi.org/10.1111/faf.12789>

B_{MSY} v MSY $B_{trigger}$ work - <https://doi.org/10.1111/faf.70066>

$B_{rebuild}$ and $T_{rebuild}$ - accepted at Fish & Fisheries

