European Parliament Forum on Recreational Fisheries and Aquatic Environment

MORE BIG FISH IN THE SEA!

Questioning the MSY paradigm for a sustainable long-term fisheries management

Co-chaired by MEP Caroline Roose
and MEP Isabel Carvalhais

@RecfishingEP #SaveEUFish #MSY

EFTTA European Fishing Tackle & Trade Association

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@RecfishingEP
#RecFishing4Sustainability
#SaveBigFish
@NiclasHerbst

Welcoming words

MEP Niclas Herbst, Chair of the Forum on Recreational Fisheries and Aquatic Environment

➢ *Next* – **Opening remarks by MEP Caroline Roose, Member of the PECH Committee**

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#SaveEUFish
@CarolineRooseEU

Opening statements

MEP Caroline Roose, Member of the PECH Committee

➢ *Next* – **Presentation by Markus Lundgren (Regional Manager, Sportfiskarna, EAA Sweden)**

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European Parliament Forum on Recreational Fisheries and Aquatic Environment

The recreational fisheries sector's perspective

Limits of the Maximum Sustainable Yield and possible improvements for a better protection of fish stocks,

Markus Lundgren, (Regional Manager, Sportfiskarna, EAA Sweden)

@RecfishingEP
#Anglers4Sustainability
#ImplementNatureLaws
Markus Lundgren

➢ *Next* – **Presentation by Christopher Griffiths (Swedish University of Agricultural Sciences)**

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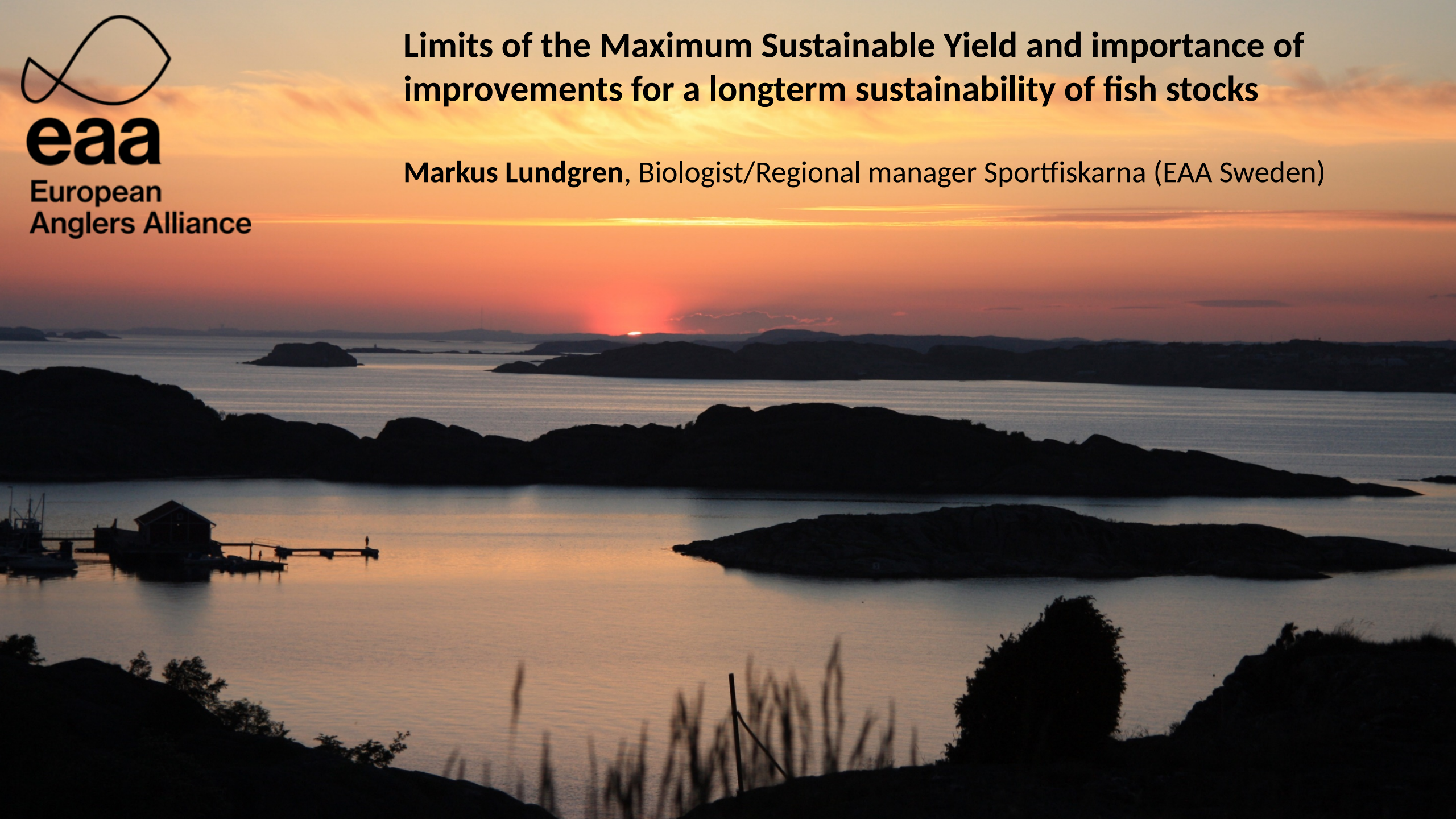

Limits of the Maximum Sustainable Yield and importance of improvements for a longterm sustainability of fish stocks

Markus Lundgren, Biologist/Regional manager Sportfiskarna (EAA Sweden)

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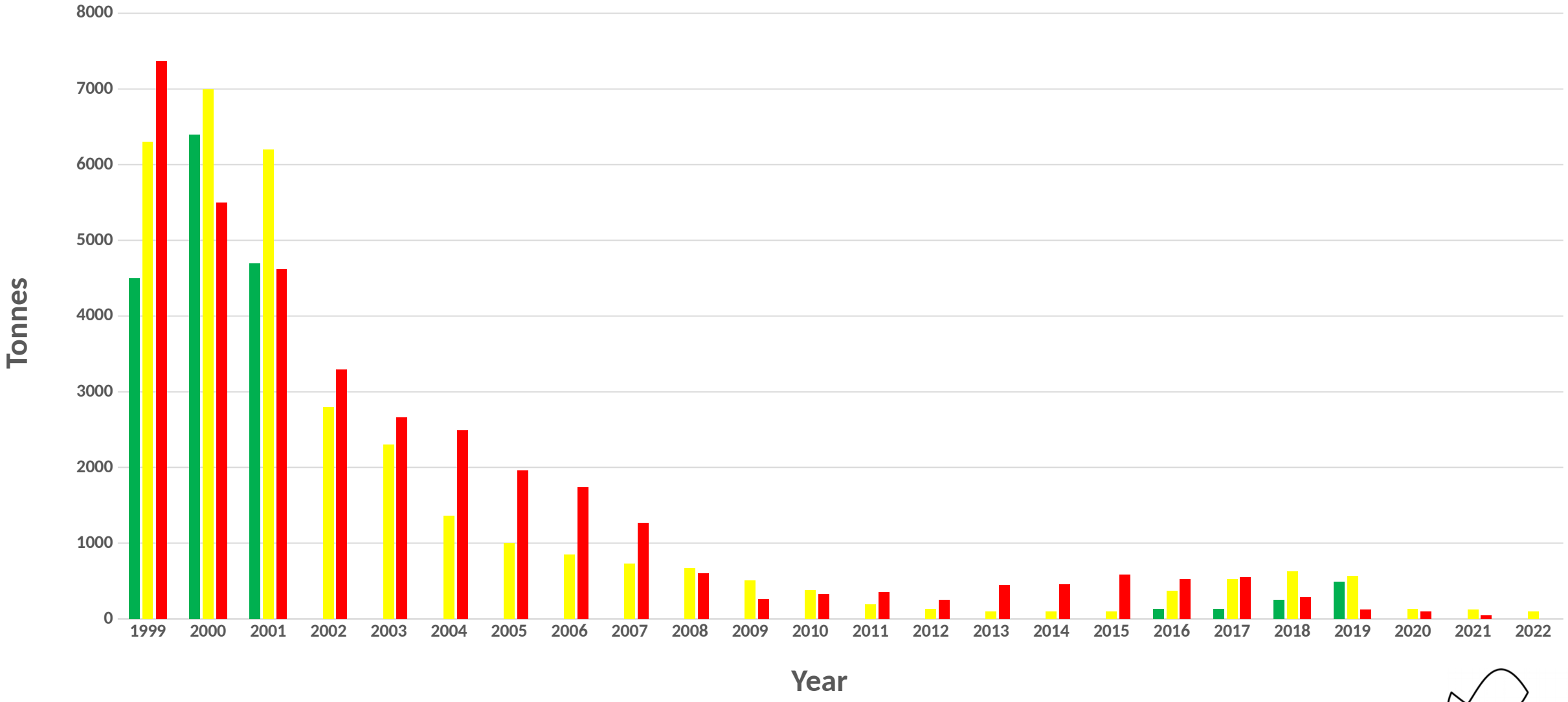
Abu Garcia
Abu Garcia

SportFiskarna

SLU Aqua

WWF

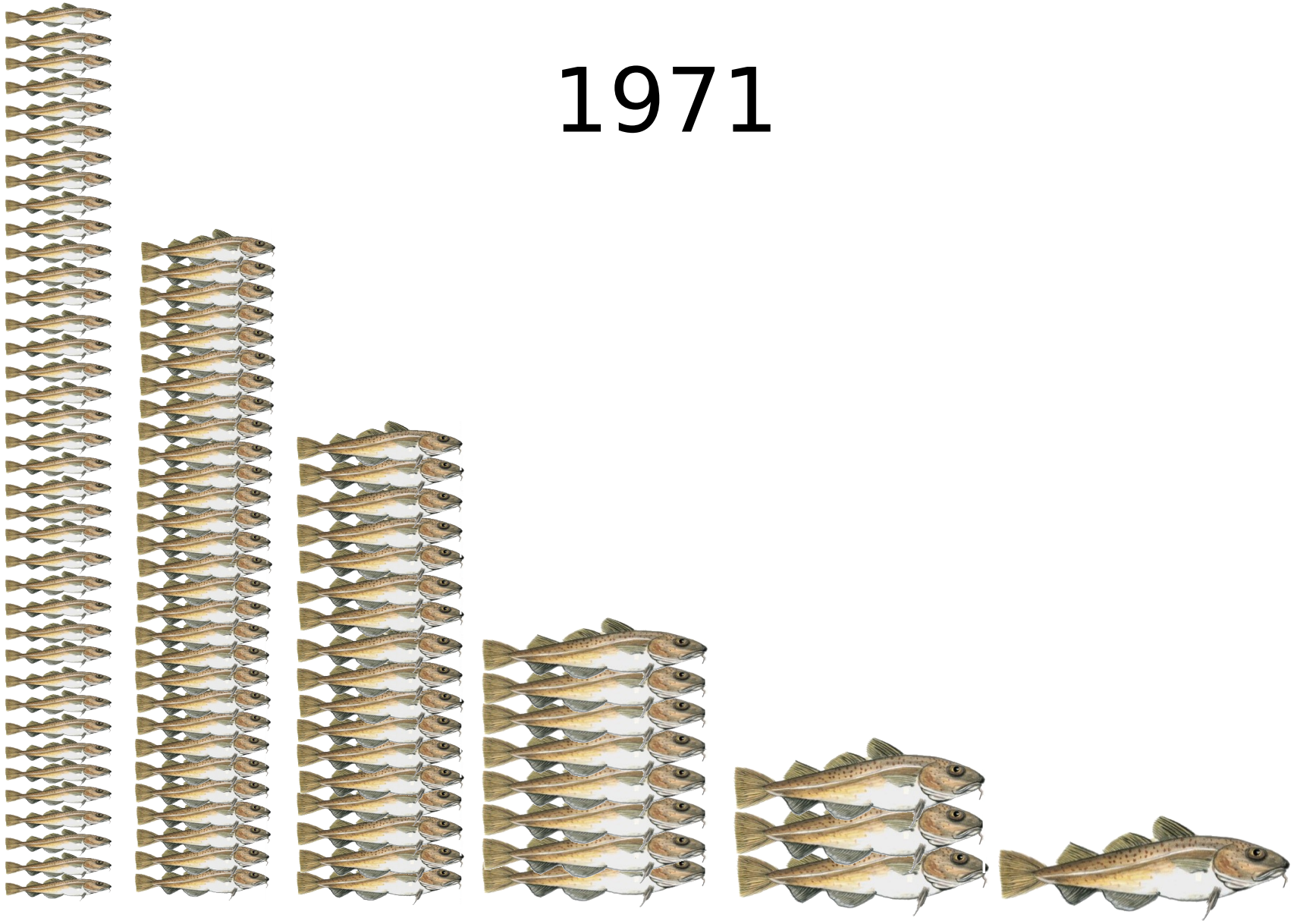
Cod, Kattegat 1999-2022



SportFiskarna

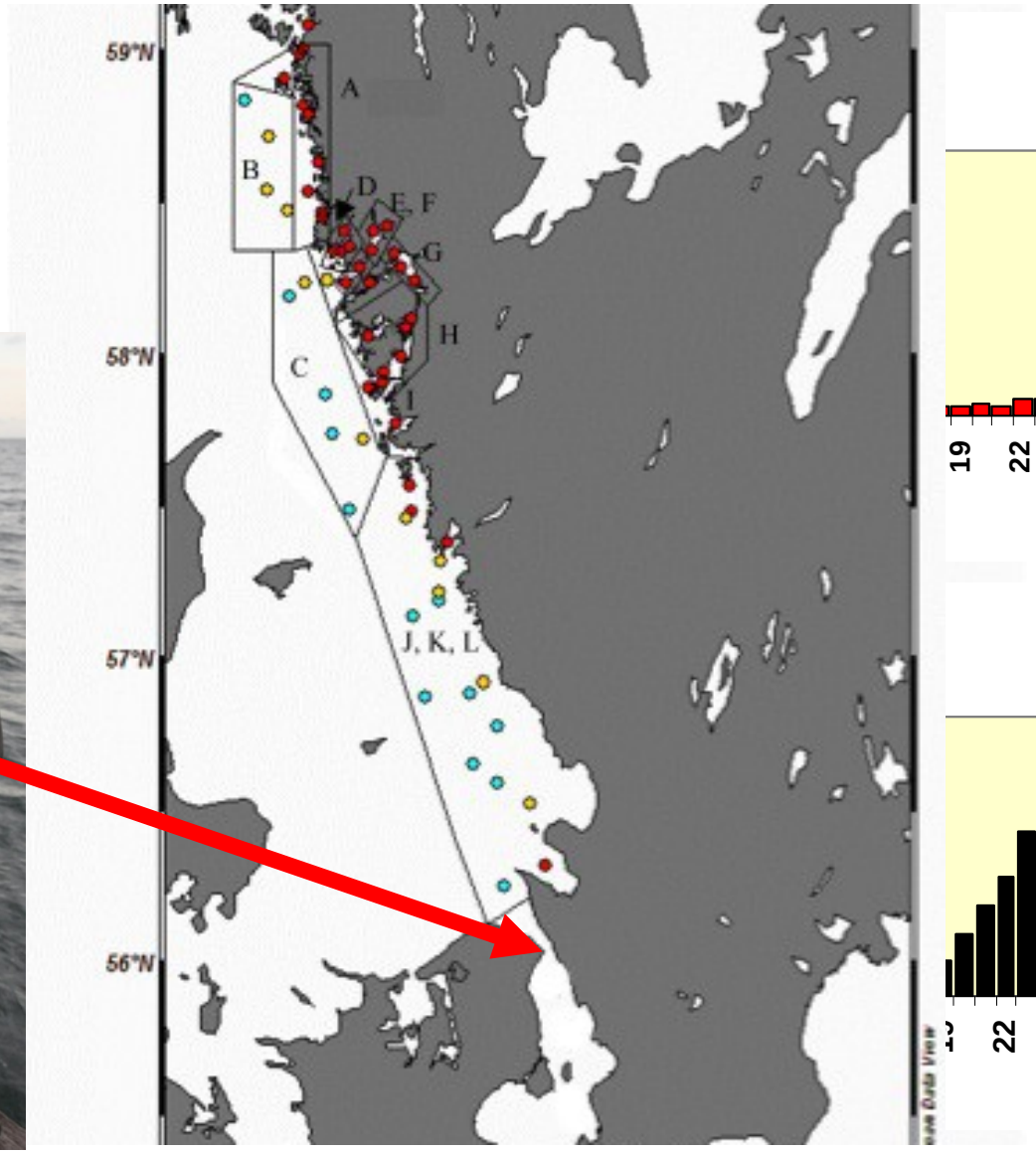
eaa European Anglers Alliance

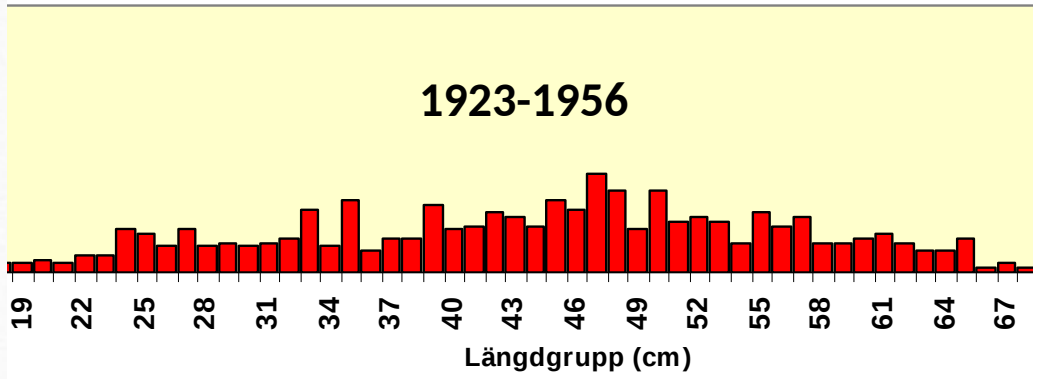
1971

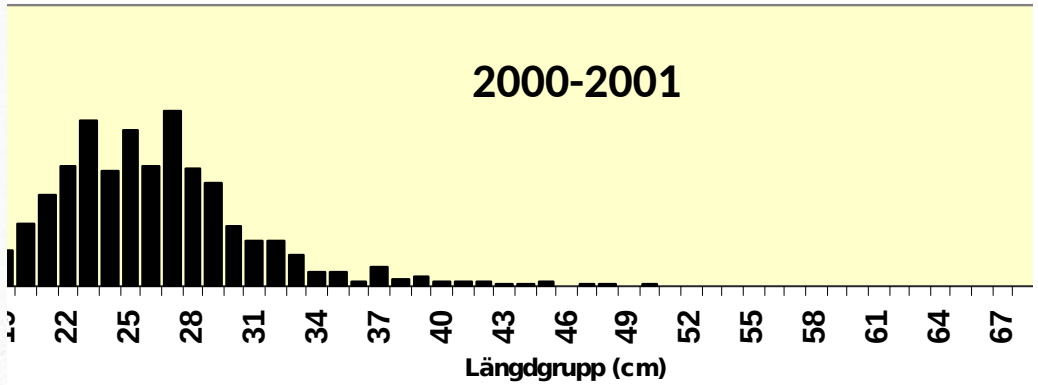


2010

Swedish trawl surveys – length on cod



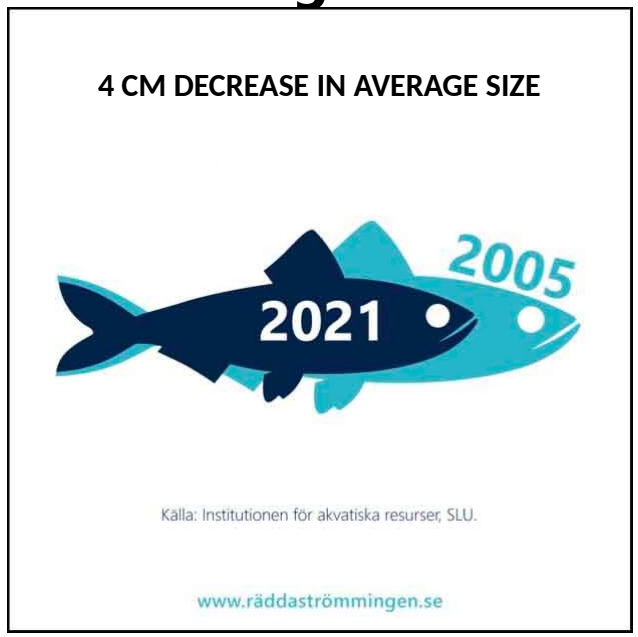


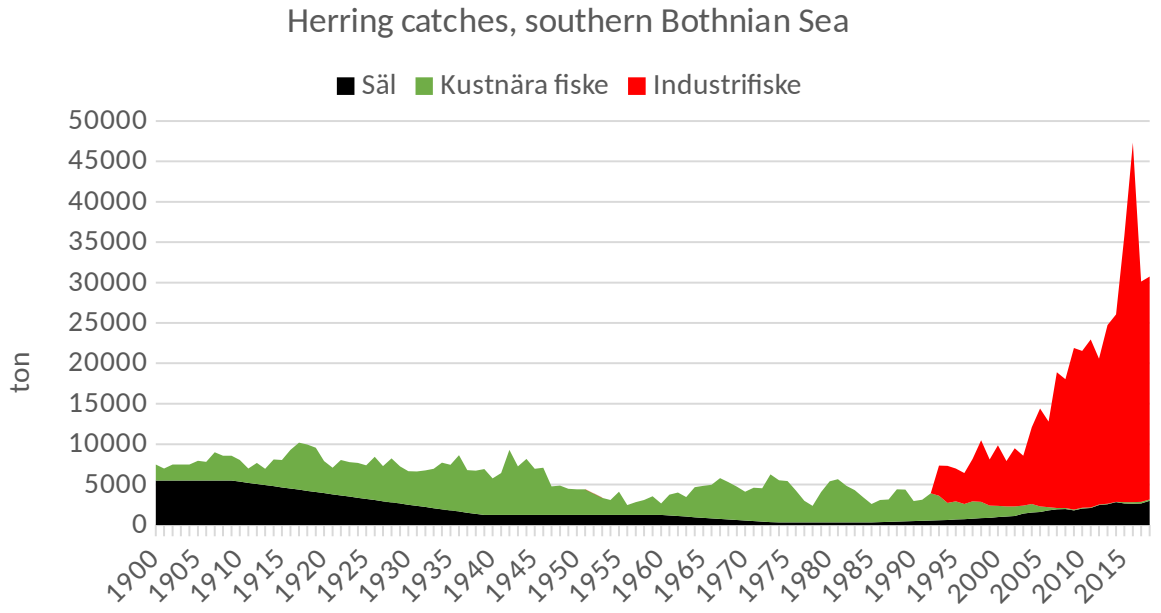


Data: Swedish Board of Fisheries

Baltic and Bothnian herring

- the engine of the ecosystem





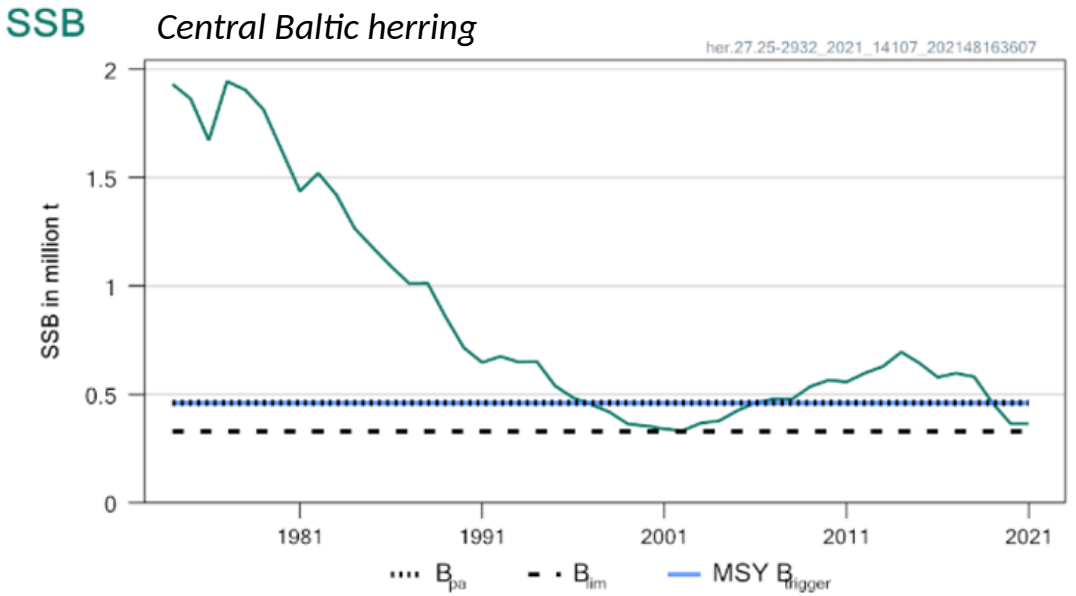
Graph: Sportfiskarna

- Large-scale pelagic (fish meal) industry fishing fishing near the coast:
  - Enormously large coastal catches
  - size doesn´t matter…
  - neither does effect on local subpopulations…

- Small-scalers:
  - decreased catches
  - almost no larger fish

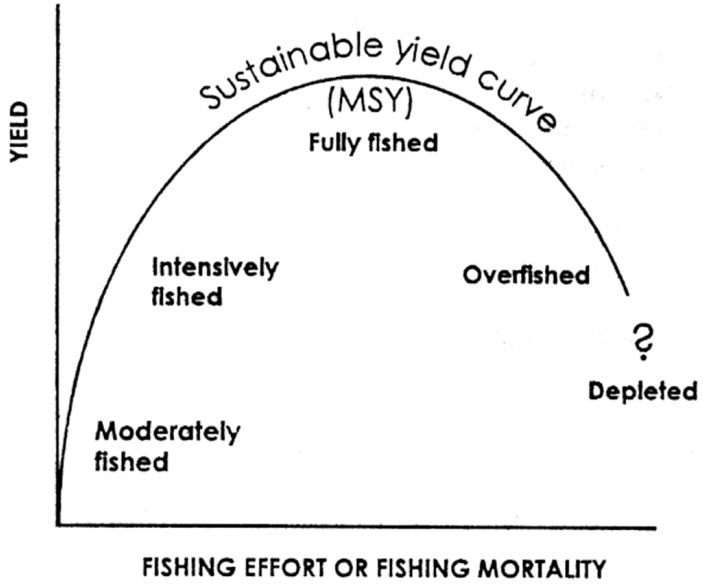
  (necessary for human consumtion)

- Scientist: disclaimer!

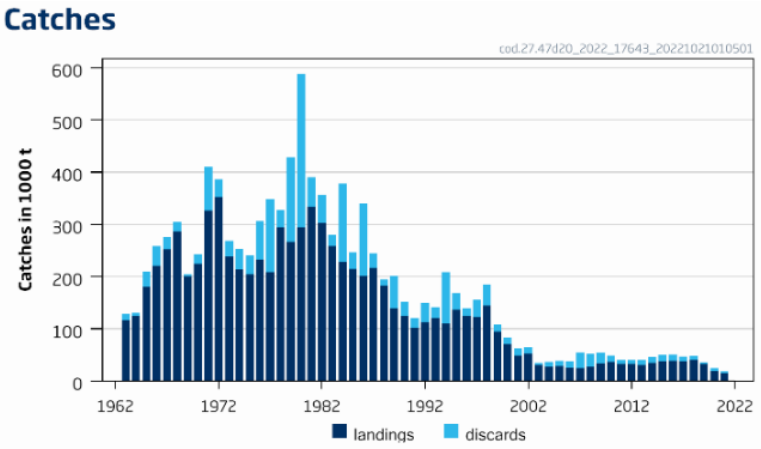


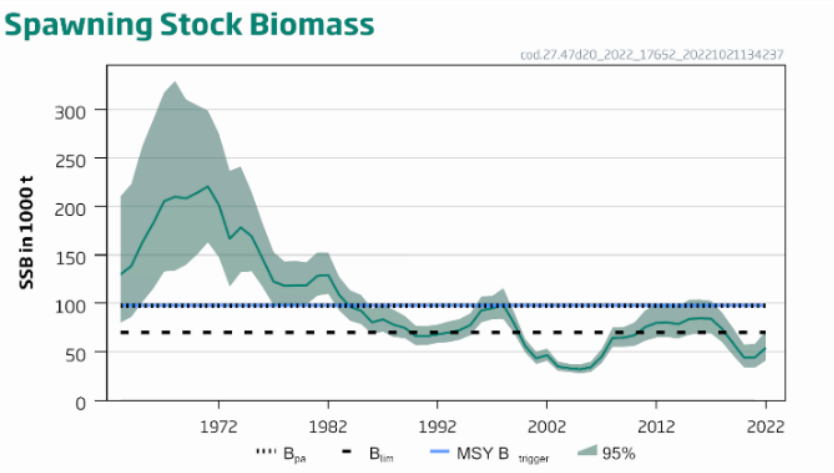
Maximum ”Sustainable” Yield (MSY)

- Production target, maximises yield
- Abundance dependant culling/cleansing to increase growth
- Decreases size, takes no consideration to size distribution
- Causes goal conflicts with other legislation
- Single-species management
- Reference values change over time, the MSY definition moves…
- Can be called ”sustainable” even if stock is weak



North Sea cod stock





“ICES advises that when the MSY approach is applied, catches in 2023 should be no more than 26 008 tonnes.”

Existing MSY management/advice vs...

- **EU Common Fisheries Policy** (CFP)
  "*The objective of the CFP is to ensure that fishing and aquaculture activities contribute to long-term environmental, economic and social sustainability*", "*ecosystem-based approach to fisheries management*" and "achieving a good environmental status by 2020"
- **EU Multiannual Plans** (MAPs)
  (*"sustainable use"*, *"recovery"*)
- **Marine Strategy Framework Directive** (MSFD)
  - "*achieving a good environmental status by 2020*", age and size distribution, and more...
- **Precautionary principle**
- **Ecosystem-based fisheries**
- **Local populations**
- **Food web interactions**

The value of big fish

- ✓ **Biological/ecological**
  - top down-effect, resilience against eutrophication
  - high fecundity, the BOFFF-hypothesis

- ✓ **Genetical**
  - efficient fishery, no big fish, selection on early maturation

- ✓ **Recreational**
  - anglers often want big fish and travel very far for it

- ✓ **Economical**
  - bigger fish = better pay
  (fish meal industry trawlers the exception)

- ✓ **Social**
  - coastal communities, small-scale fisheries

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SportFiskarna

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European Parliament Forum on Recreational Fisheries and Aquatic Environment

Including older fish in fisheries management – a new age-based indicator (ABIMSY) for exploited stocks

@RecfishingEP
#LongTermMatters
#BringOldFishBack
#OldFish4Sustainability
@christophgriff5

Dr Christopher Griffiths, (Swedish University of Agricultural Sciences)

➢ *Next* – **Presentation by Christopher Griffiths (Swedish University of Agricultural Sciences)**

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Including older fish in fisheries management – a new age-based indicator (ABI_{MSY}) for exploited stocks

Christopher Griffiths, Henning Winker, Valerio Bartolino, Håkan Wennhage,

Alessandro Orio and Massimiliano Cardinale

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General themes

1. Age-structure (ABI_{MSY})
   a) MSFD Descriptor 3 Criteria 3 of GES – ‘age and size distribution that is indicative of a healthy stock’
   b) General needs on sustainability, resilience and recovery

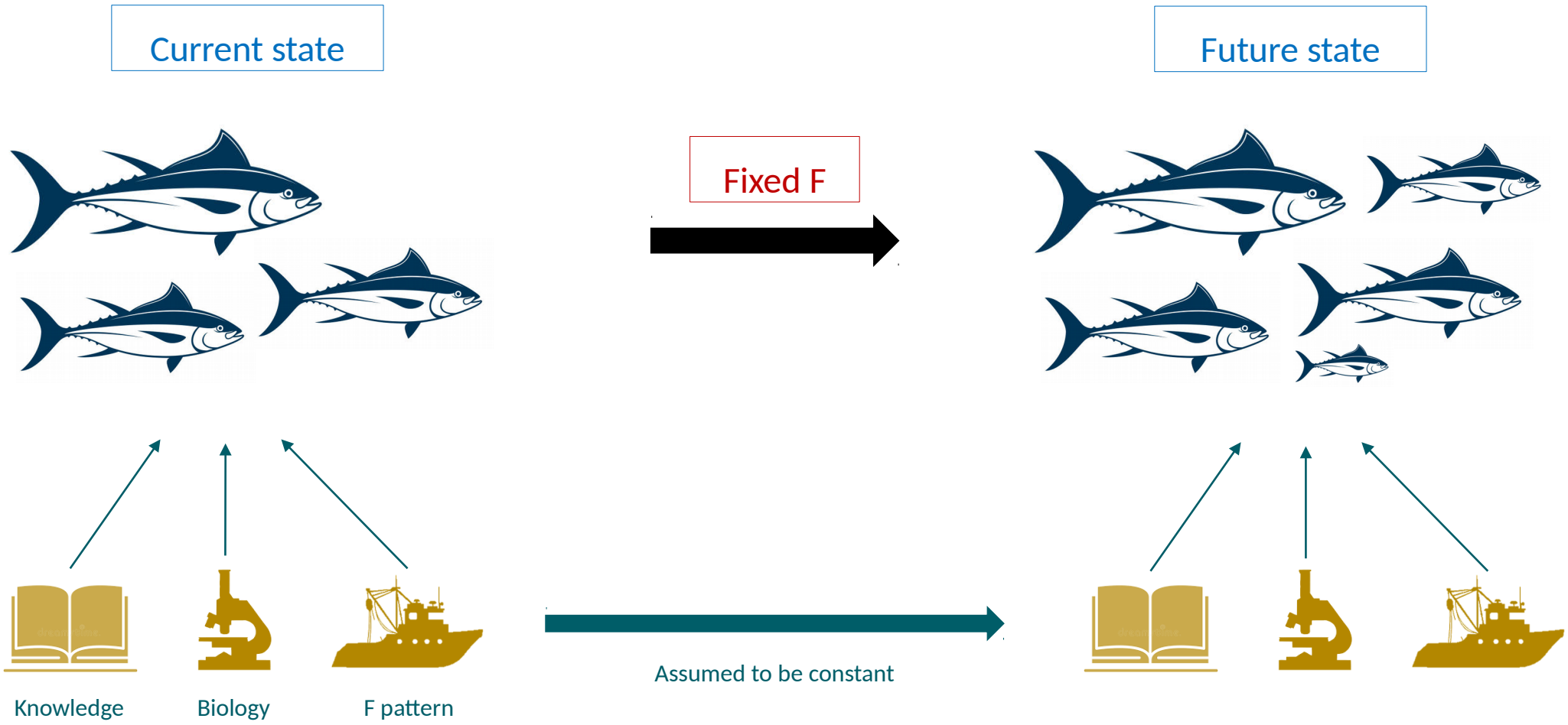
2. Can we fish differently?
   a) Shift in management targets/more precautionary
   b) What will reductions in F mean for long term yields?

Case studies and tools for fisheries management

SCIENCE AND EDUCATION FOR SUSTAINABLE LIFE

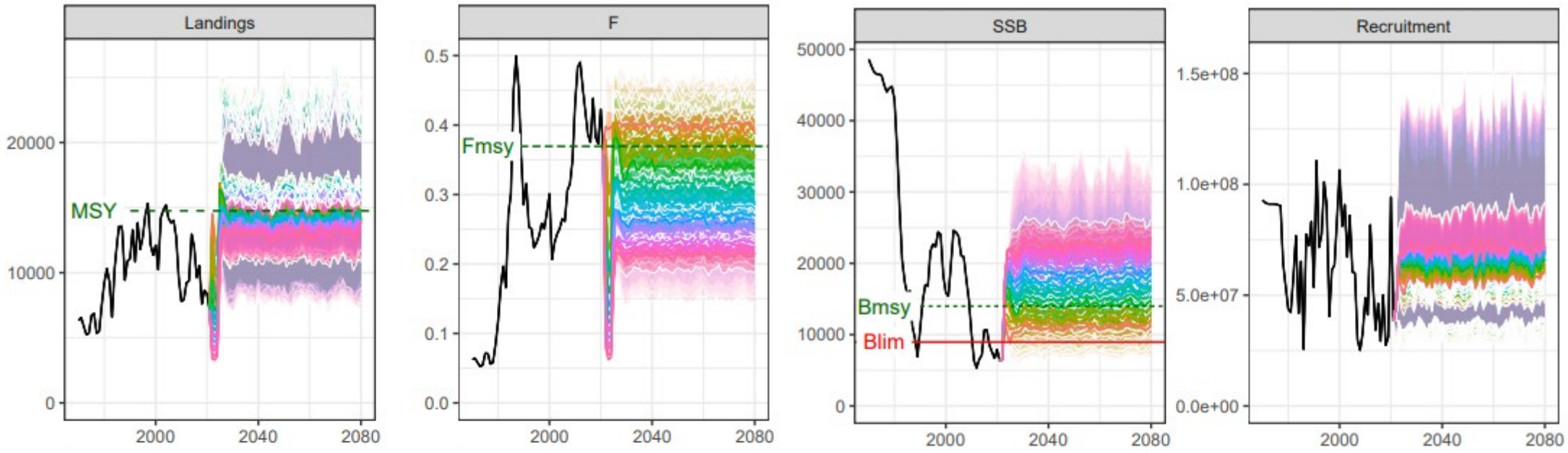
Management Strategy Evaluations (MSEs)

Estimation of reference points (management targets)



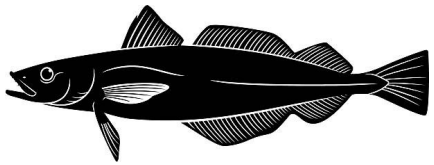
Management Strategy Evaluations (MSEs)

Estimation of reference points (management targets)



Calculating ABI_{MSY}

Stock - hke.27.3a46-8abd



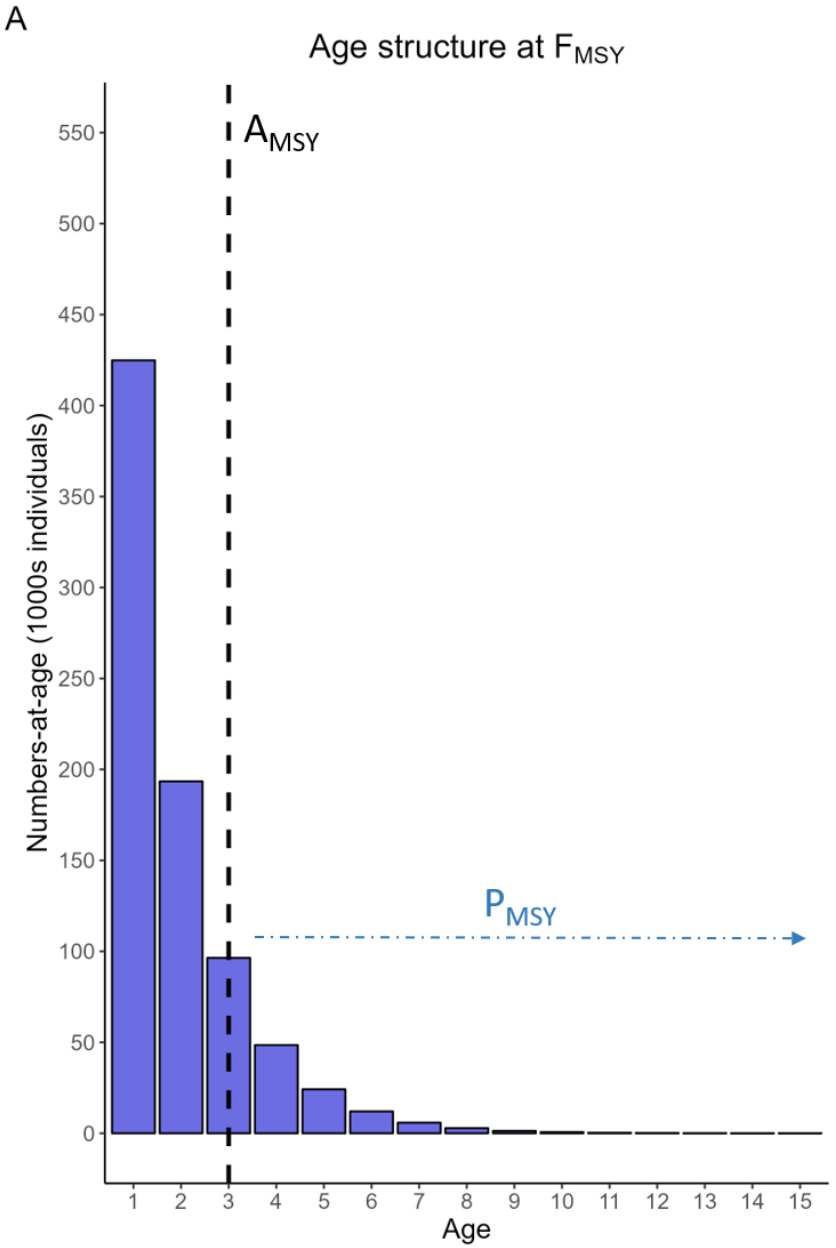
Older fish

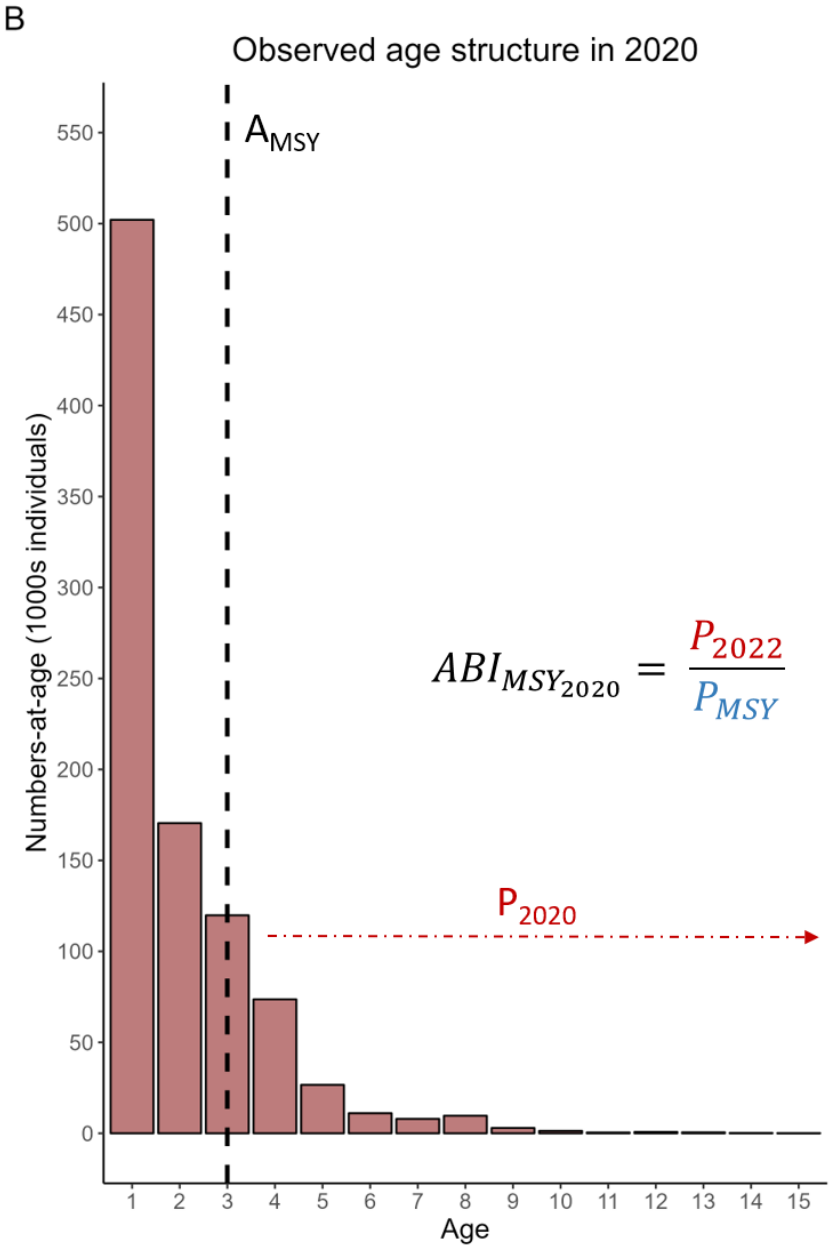
A_{MSY} = 90th percentile

Spawning success

Resilience

Communication on space use





$$ABI_{MSY_{2020}} = \frac{P_{2022}}{P_{MSY}}$$

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

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

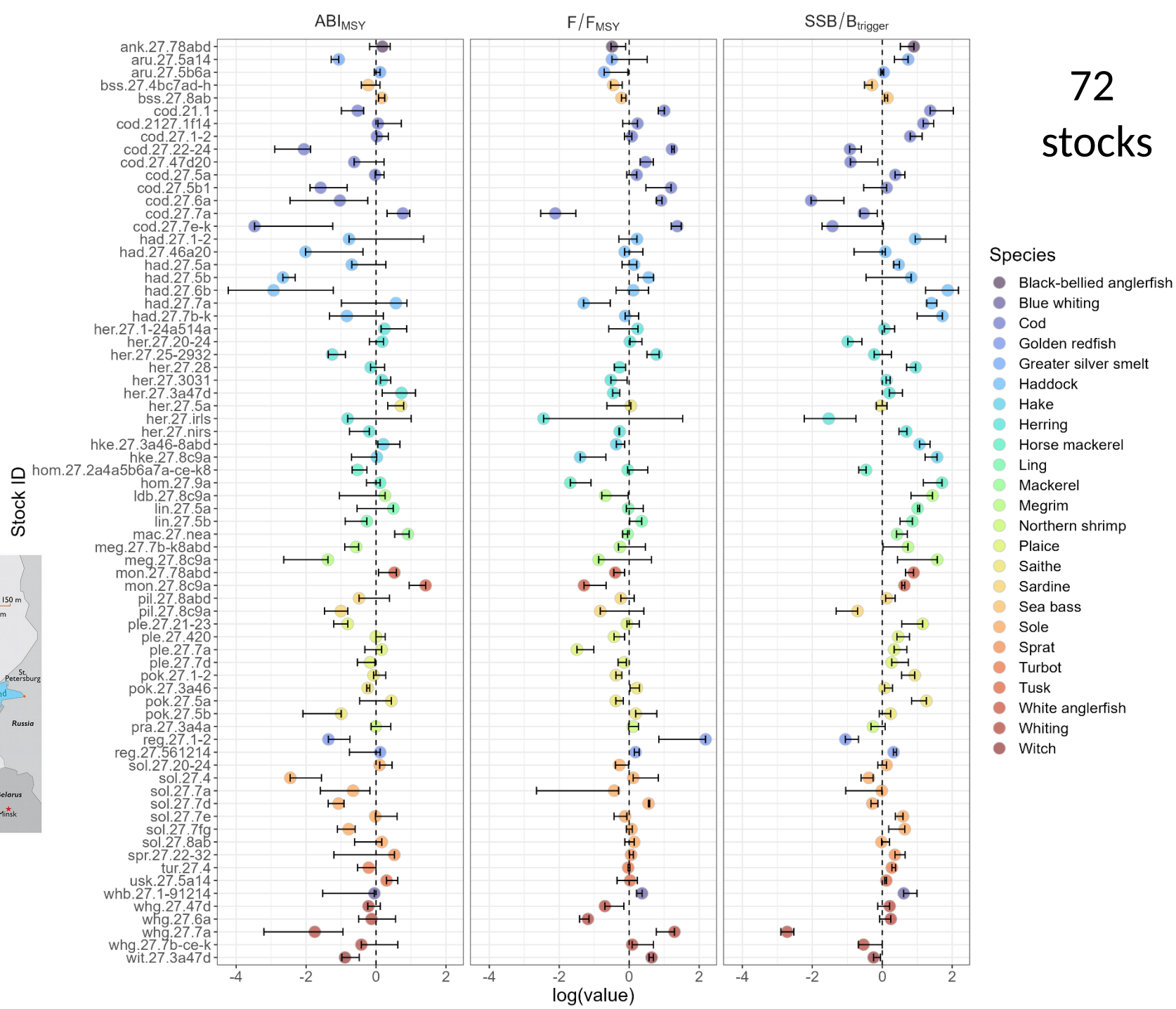
22 stocks: $ABI_{MSY} < 0.5$ (31%)

79%

$ABI_{MSY} < 1$

50%

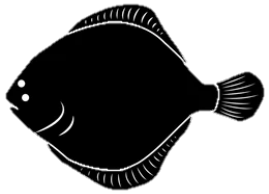
$ABI_{MSY} < 1$



72 stocks

Species

- Black-bellied anglerfish
- Blue whiting
- Cod
- Golden redfish
- Greater silver smelt
- Haddock
- Hake
- Herring
- Horse mackerel
- Ling
- Mackerel
- Megrim
- Northern shrimp
- Plaice
- Saithe
- Sardine
- Sea bass
- Sole
- Sprat
- Turbot
- Tusk
- White anglerfish
- Whiting
- Witch



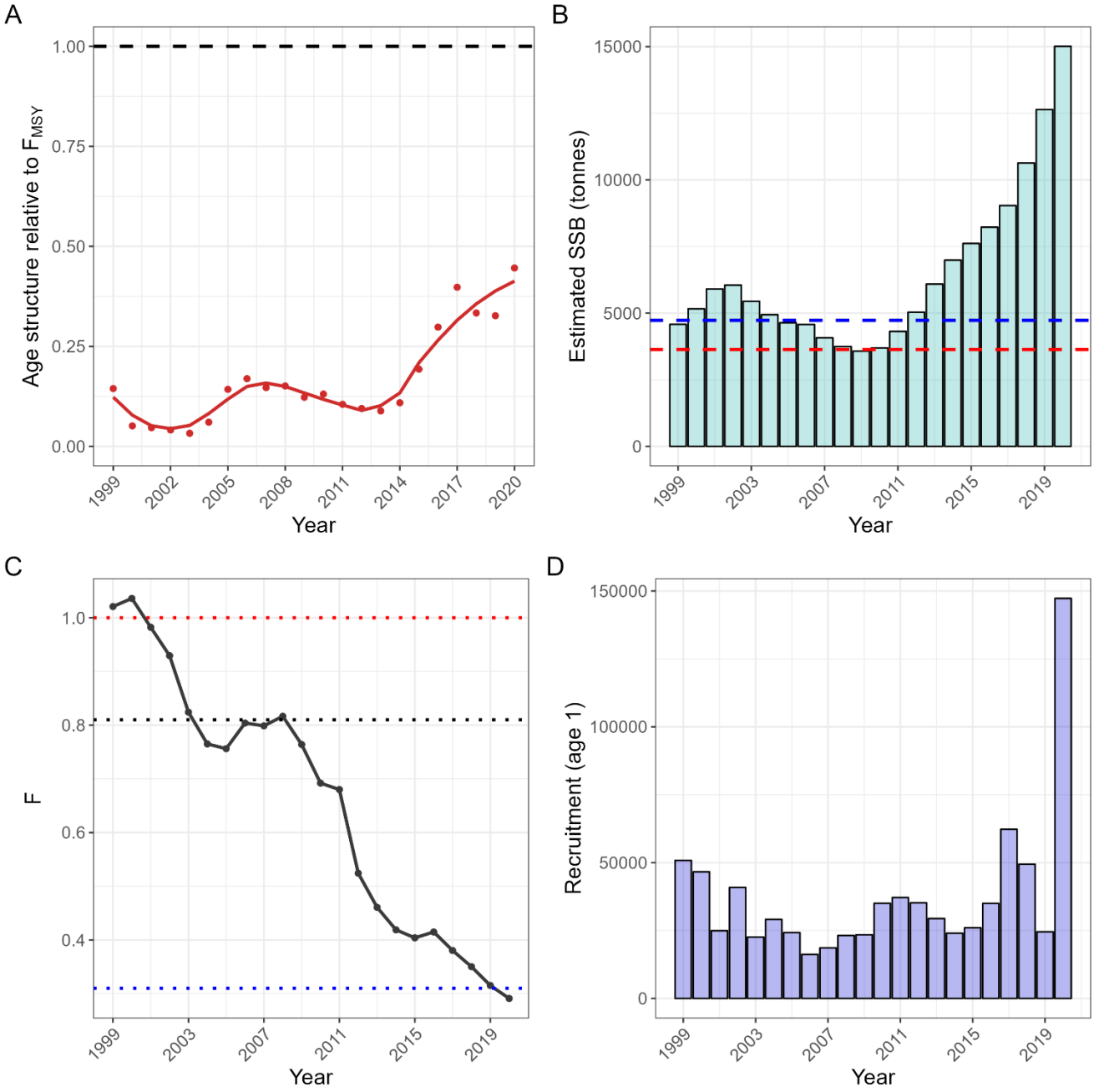
European plaice in Baltic Sea (ple.27.21-23)

High SSB

Low F and declining

Low proportion of older fish

Indications of stock recovery but increasing F could lead to growth overfishing



Conclusions #1

A. ABI_{MSY} provides information on the age structure of exploited stocks that aligns well with current ICES stock assessments and advice

B. Meets the recommendations of the EU Commission and those described in the scientific literature for the MSFDs D3C3 of GES

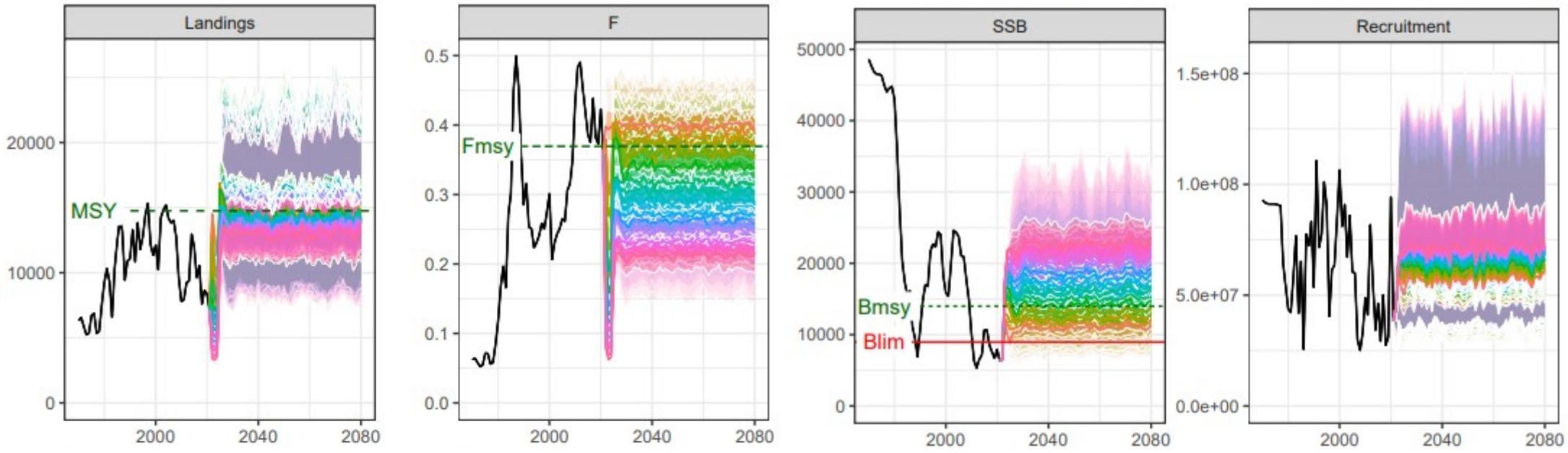
C. Has established reference points (age structure at F_{MSY}) that match policy objectives

D. Is perfectly placed to address two general needs in fisheries management:

- ❑ Does a stock have the age structure it needs to sustain an advised level of catch?
- ❑ Does a stock have enough older fish to recover as expected from fishing?

Management Strategy Evaluations (MSEs)

Estimation of reference points (management targets)

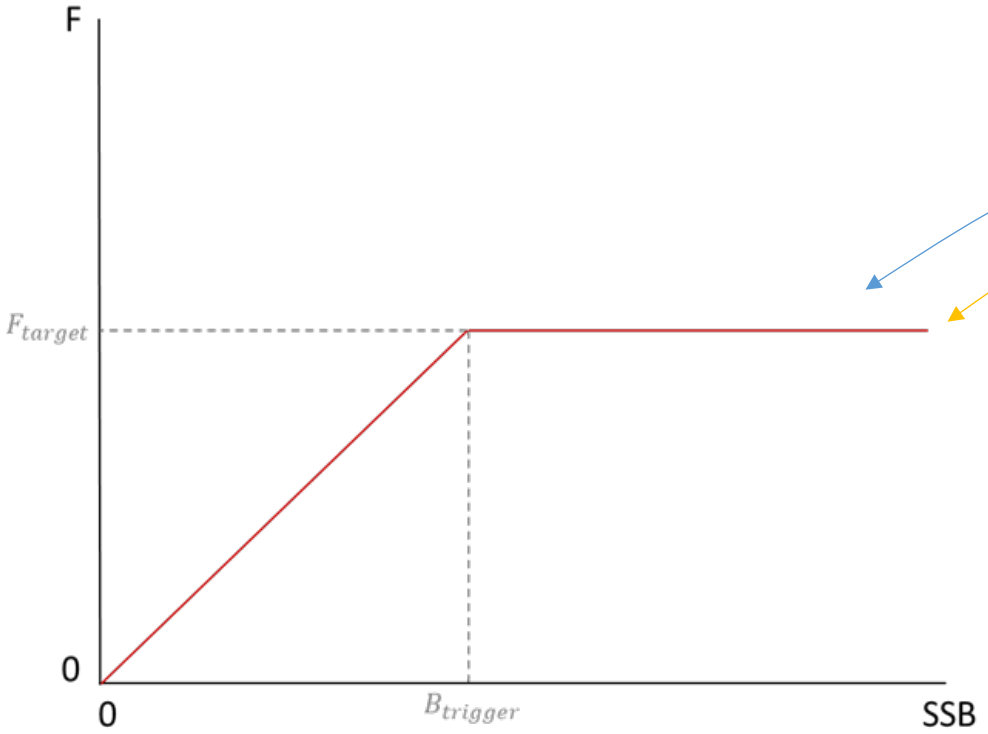


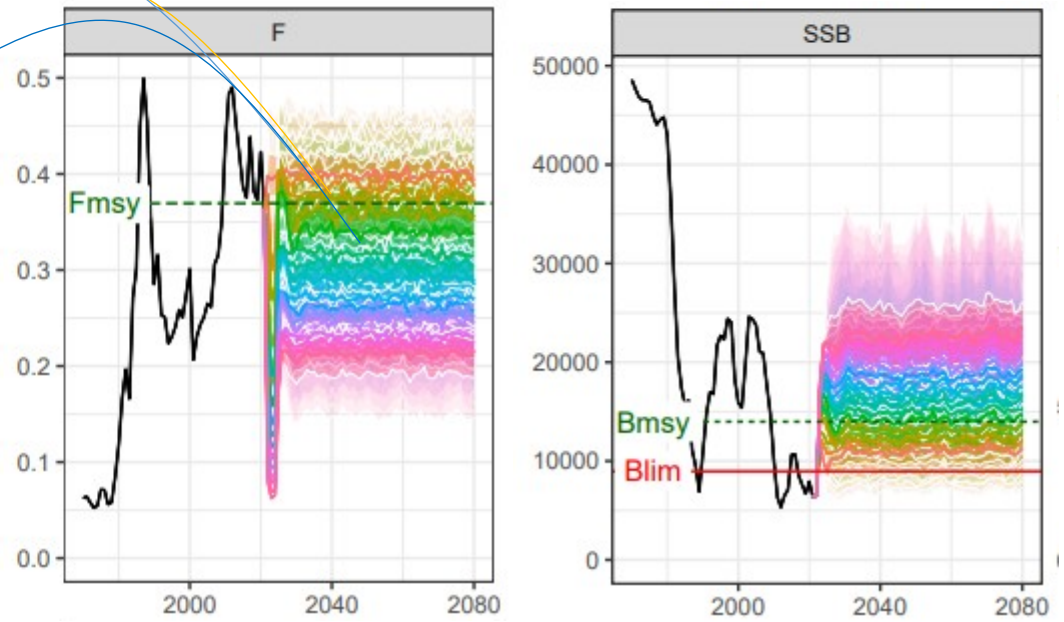
Harvest Control Rules

HCR performance criteria:

1. The probability of SSB falling below B_{lim} in any single year should not exceed a 5% probability

2. High long-term yields should be achieved that, ideally, should correspond to fishing at F_{MSY}





ICES Advice on fishing opportunities, catch, and effort
Greater North Sea ecoregion
Published 09 May 2022

Northern shrimp (*Pandalus borealis*) in divisions 3.a and 4.a East (Skagerrak and Kattegat and northern North Sea in the Norwegian Deep)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches should be no more than 7712 tonnes in 2022, and catches for the first six months of 2023 should be no more than 5882 tonnes.

Stock development over time

Fishing pressure on the stock is below F_{MSY}, and spawning-stock size is below MSY $B_{trigger}$ and B_{pa} but above B_{lim}.

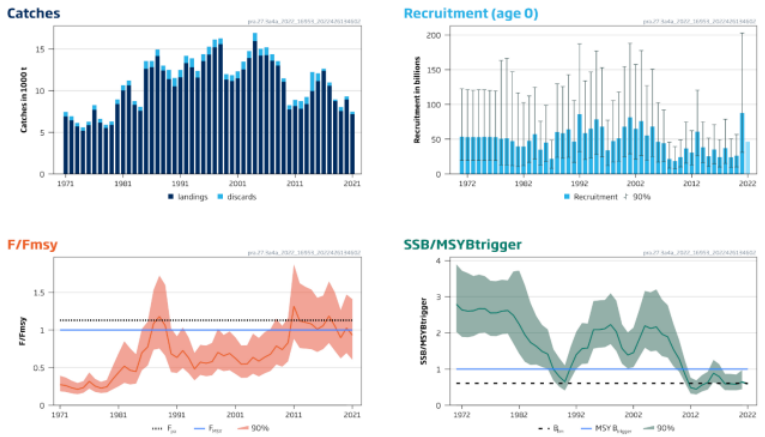
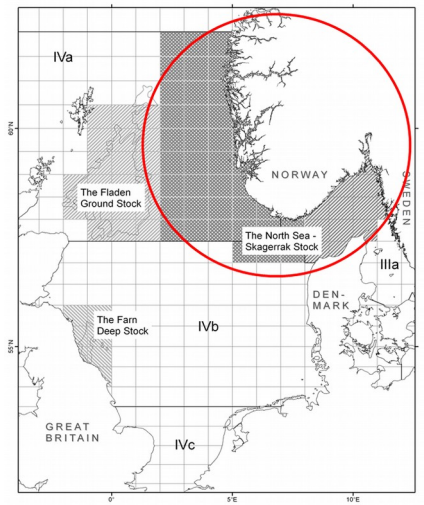
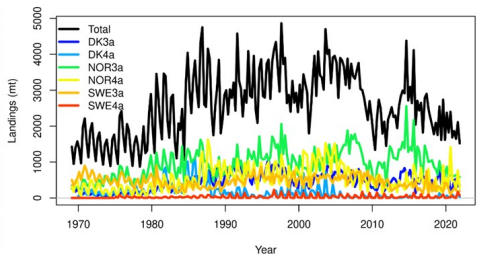
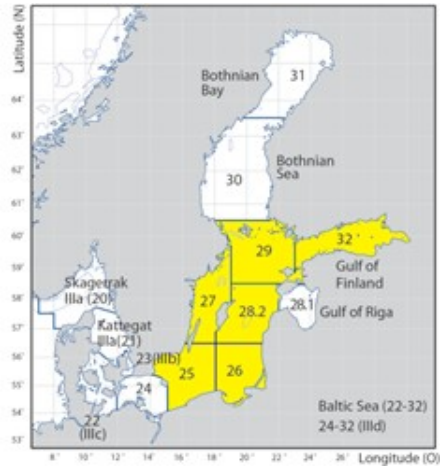
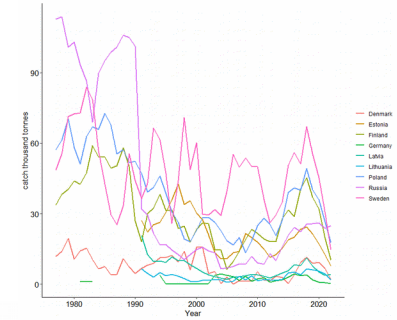


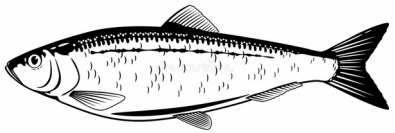
Figure 1 Northern shrimp (*Pandalus borealis*) in divisions 3.a and 4.a East. Summary of the stock assessment. The assumed recruitment value for 2022 is shown in a lighter shade of blue. [Note: B_{pa} = MSY $B_{trigger}$]. Spawning-stock biomass (SSB) is the biomass of mature females.











ICES Advice on fishing opportunities, catch, and effort
Baltic Sea ecoregion
Published 31 May 2022
Version 2: 17 June 2022

Herring (*Clupea harengus*) in subdivisions 25–29 and 32, excluding the Gulf of Riga (central Baltic Sea)

ICES advice on fishing opportunities

ICES advises that when the EU multiannual plan (MAP) for the Baltic Sea is applied, catches in 2023 that correspond to the F ranges in the plan are between 70 130 and 95 643 tonnes. The current advice applies to all catches from the stock, including those taken in Subdivision 28.1.

Stock development over time

Fishing pressure on the stock is above F_{MSY} and between F_{pa} and F_{lim} and that spawning-stock size is below MSY $B_{trigger}$ and between B_{pa} and B_{lim}.

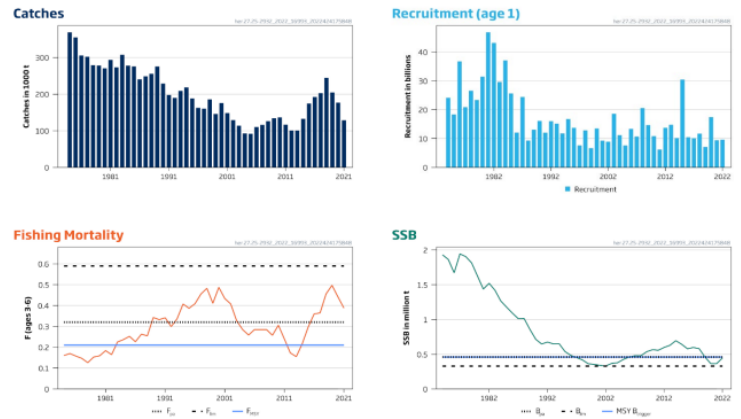


Figure 1 Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga. Summary of the stock assessment. SSB at spawning time in 2022 is predicted.

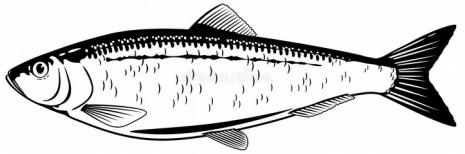
Management Strategy Evaluation outcomes for a range of Harvest Control Rules for northern shrimp in divisions 3.a and 4.a East

HCRs		Objectives		
$B_{trigger}$	F_{target}	$B < B_{lim}$	*Catch/MSY*	B/B_{MSY}
No trigger	F_{MSY}	0.34	1.00	0.82
60% x B_{MSY}	F_{MSY}	0.28	1.00	0.86
80% x B_{MSY}	F_{MSY}	0.22	1.01	0.92
B_{MSY}	F_{MSY}	0.14	1.01	0.99
60% x $B_{25\%}$	$F_{B25\%}$	0.22	0.97	0.98
80% x $B_{25\%}$	$F_{B25\%}$	0.17	0.97	1.05
$B_{25\%}$	$F_{B25\%}$	0.10	0.96	1.12
60% x $B_{30\%}$	$F_{B30\%}$	0.09	0.98	1.20
80% x $B_{30\%}$	$F_{B30\%}$	0.06	0.98	1.25
90% x $B_{30\%}$	$F_{B30\%}$	0.04	0.97	1.28
$B_{30\%}$	$F_{B30\%}$	0.03	0.97	1.34
60% x $B_{35\%}$	$F_{B35\%}$	0.02	0.97	1.42
80% x $B_{35\%}$	$F_{B35\%}$	0.02	0.96	1.47
90% x $B_{35\%}$	$F_{B35\%}$	0.02	0.95	1.49
$B_{35\%}$	$F_{B35\%}$	0.02	0.94	1.53
60% x $B_{40\%}$	$F_{B40\%}$	0.01	0.94	1.63
80% x $B_{40\%}$	$F_{B40\%}$	0.00	0.93	1.66
90% x $B_{40\%}$	$F_{B40\%}$	0.00	0.91	1.71
$B_{40\%}$	$F_{B40\%}$	0.00	0.90	1.76

HCR accepted – maximises catch

Precautionary HCR – higher B lower F same catch

Management Strategy Evalutions outcomes for a range of Harvest Control Rules for herring in subdivisions 25–29 and 32, excluding the Gulf of Riga.



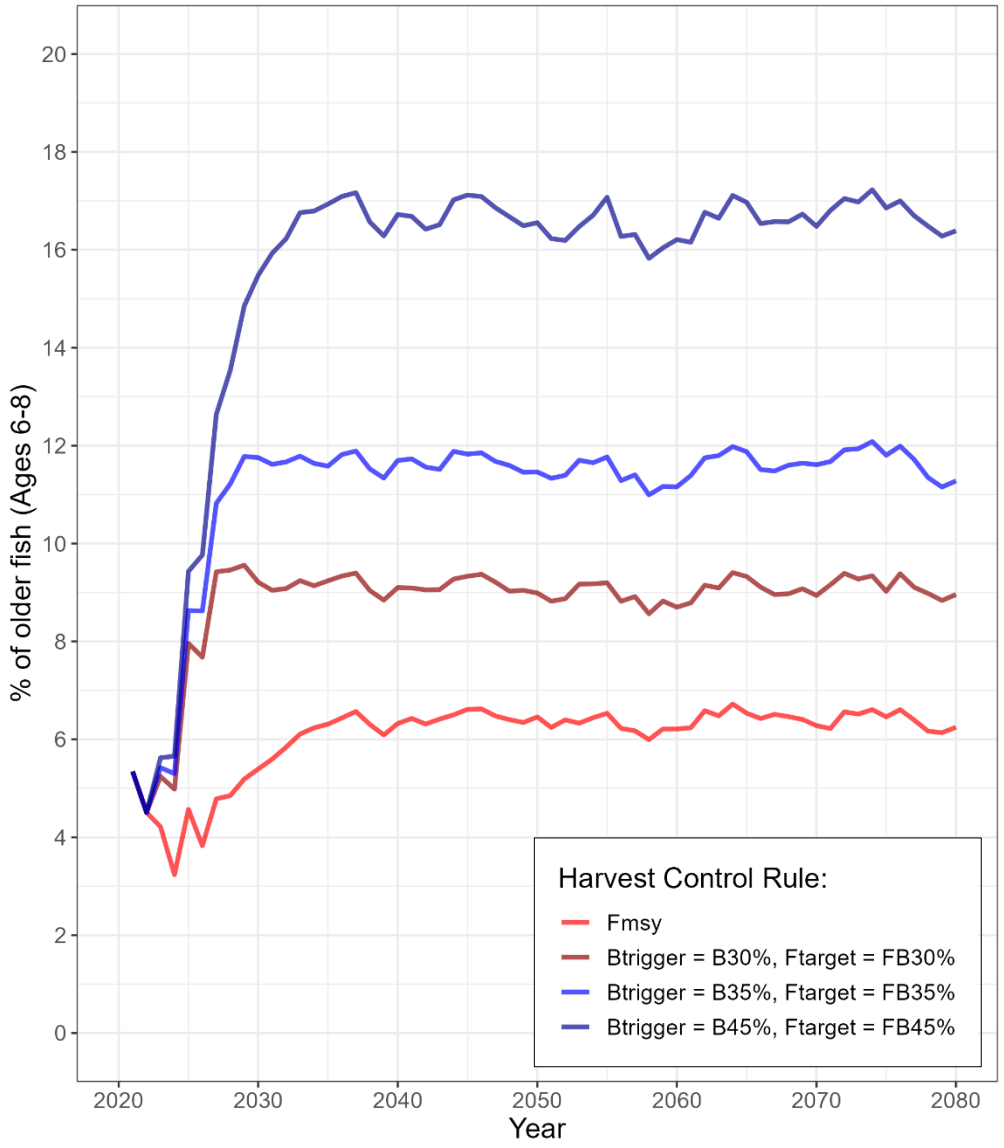
HCRs		Objectives		
$B_{trigger}$	F_{target}	$B < B_{lim}$	*Catch/MSY*	B/B_{MSY}
No trigger	F_{MSY}	0.07	1.00	0.81
60% x B_{MSY}	F_{MSY}	0.06	1.00	0.82
80% x B_{MSY}	F_{MSY}	0.03	1.00	0.85
B_{MSY}	F_{MSY}	0.01	1.00	0.90
60% x $B_{20\%}$	$F_{B20\%}$	0.50	0.92	0.56
80% x $B_{20\%}$	$F_{B20\%}$	0.38	0.94	0.59
$B_{20\%}$	$F_{B20\%}$	0.30	0.95	0.64
60% x $B_{25\%}$	$F_{B25\%}$	0.15	0.98	0.71
80% x $B_{25\%}$	$F_{B25\%}$	0.09	0.98	0.74
$B_{25\%}$	$F_{B25\%}$	0.04	0.99	0.79
60% x $B_{30\%}$	$F_{B30\%}$	0.02	1.01	0.86
80% x $B_{30\%}$	$F_{B30\%}$	0.01	1.01	0.90
$B_{30\%}$	$F_{B30\%}$	0.00	1.01	0.95
60% x $B_{35\%}$	$F_{B35\%}$	0.00	1.01	1.03
80% x $B_{35\%}$	$F_{B35\%}$	0.00	1.01	1.06
$B_{35\%}$	$F_{B35\%}$	0.00	1.00	1.11
60% x $B_{40\%}$	$F_{B40\%}$	0.00	1.00	1.20
80% x $B_{40\%}$	$F_{B40\%}$	0.00	0.99	1.22
90% x $B_{40\%}$	$F_{B40\%}$	0.00	0.98	1.24
$B_{40\%}$	$F_{B40\%}$	0.00	0.98	1.28
60% x $B_{45\%}$	$F_{B45\%}$	0.00	0.97	1.38
80% x $B_{45\%}$	$F_{B45\%}$	0.00	0.96	1.40
90% x $B_{45\%}$	$F_{B45\%}$	0.00	0.96	1.43
$B_{45\%}$	$F_{B45\%}$	0.00	0.95	1.46

HCR accepted

Precautionary HCRs – higher B lower F comparable catch

Herring in subdivisions 25–29 and 32, excluding the Gulf of Riga.

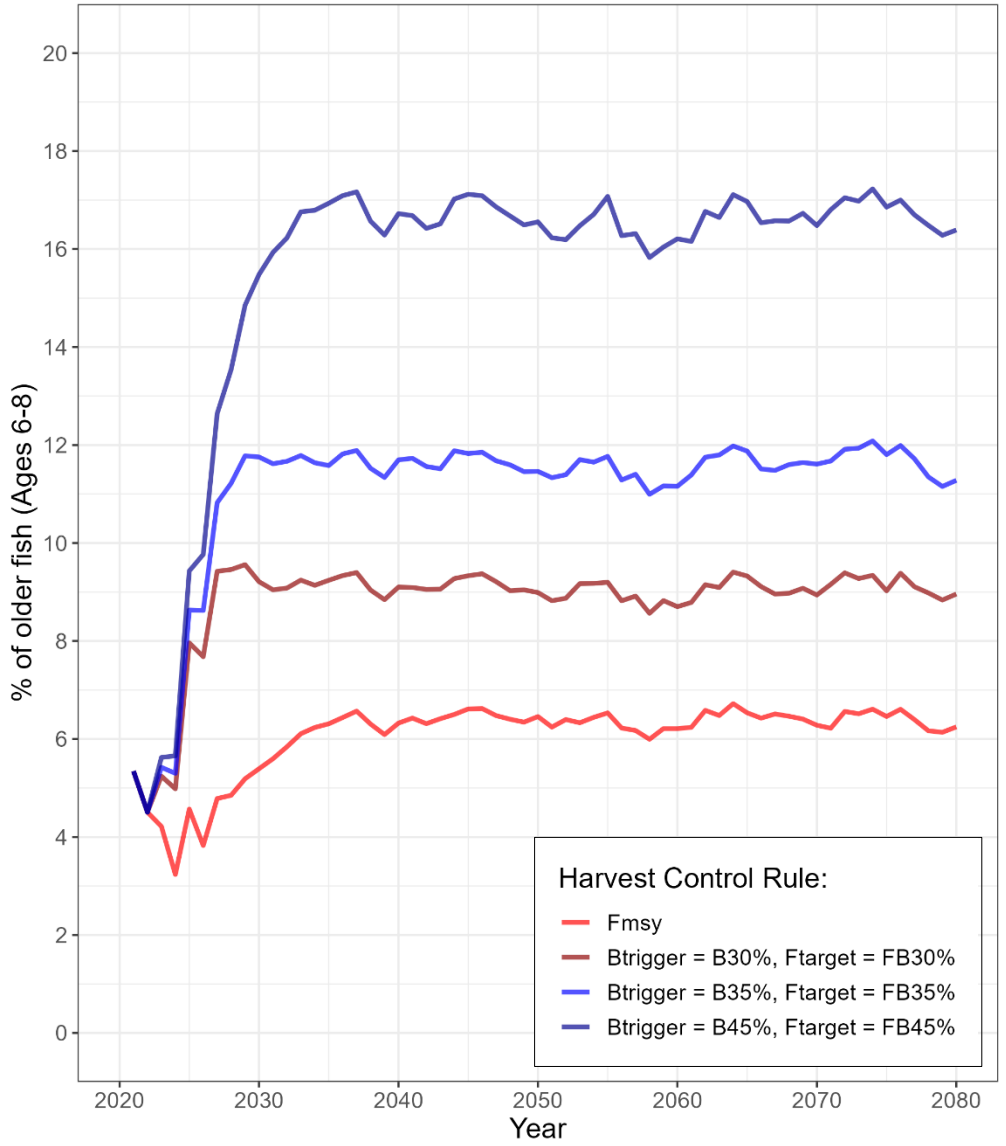
HCRs		Objectives		
$B_{trigger}$	F_{target}	$B < B_{lim}$	*Catch/MSY*	B/B_{MSY}
No trigger	F_{MSY}	0.07	1.00	0.81
60% x B_{MSY}	F_{MSY}	0.06	1.00	0.82
80% x B_{MSY}	F_{MSY}	0.03	1.00	0.85
B_{MSY}	F_{MSY}	0.01	1.00	0.90
60% x $B_{20\%}$	$F_{B20\%}$	0.50	0.92	0.56
80% x $B_{20\%}$	$F_{B20\%}$	0.38	0.94	0.59
$B_{20\%}$	$F_{B20\%}$	0.30	0.95	0.64
60% x $B_{25\%}$	$F_{B25\%}$	0.15	0.98	0.71
80% x $B_{25\%}$	$F_{B25\%}$	0.09	0.98	0.74
$B_{25\%}$	$F_{B25\%}$	0.04	0.99	0.79
60% x $B_{30\%}$	$F_{B30\%}$	0.02	1.01	0.86
80% x $B_{30\%}$	$F_{B30\%}$	0.01	1.01	0.90
$B_{30\%}$	$F_{B30\%}$	0.00	1.01	0.95
60% x $B_{35\%}$	$F_{B35\%}$	0.00	1.01	1.03
80% x $B_{35\%}$	$F_{B35\%}$	0.00	1.01	1.06
$B_{35\%}$	$F_{B35\%}$	0.00	1.00	1.11
60% x $B_{40\%}$	$F_{B40\%}$	0.00	1.00	1.20
80% x $B_{40\%}$	$F_{B40\%}$	0.00	0.99	1.22
90% x $B_{40\%}$	$F_{B40\%}$	0.00	0.98	1.24
$B_{40\%}$	$F_{B40\%}$	0.00	0.98	1.28
60% x $B_{45\%}$	$F_{B45\%}$	0.00	0.97	1.38
80% x $B_{45\%}$	$F_{B45\%}$	0.00	0.96	1.40
90% x $B_{45\%}$	$F_{B45\%}$	0.00	0.96	1.43
$B_{45\%}$	$F_{B45\%}$	0.00	0.95	1.46

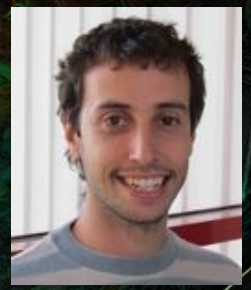


Conclusions #2

Fishing at an **F lower** than F_{MSY} in the long term can result in:

- Increased biomass
- Increased abundance of older/larger fish
- Very limited loss in long term catch





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Questions

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European Parliament Forum on Recreational Fisheries and Aquatic Environment

Discussion and debate with the audience

Possibilities to consider the fish stocks' age and size in the future fish stocks management decisions

@RecfishingEP
#GreenMSY
#MSFD
#Anglers4Sustainability
@CarolineRooseEU

Moderated by MEP Caroline Roose

➢ *Next* – **Concluding remarks by MEP Isabel Carvalhais**

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@RecfishingEP
#LongTermFishing
#Anglers4Nature
@IECarvalhais

Concluding remarks

by MEP Isabel Carvalhais, Member of the PECH Committee

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Thank you for your participation!

@RecfishingEP

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