

# Towards Healthy Stocks and Healthy Profits in European Fisheries

Rainer Froese

IFM-GEOMAR

[rfroese@ifm-geomar.de](mailto:rfroese@ifm-geomar.de)

Presentation at Hearing

„How much fish can be safely caught?“

Brussels, 3rd May 2011

# Overview

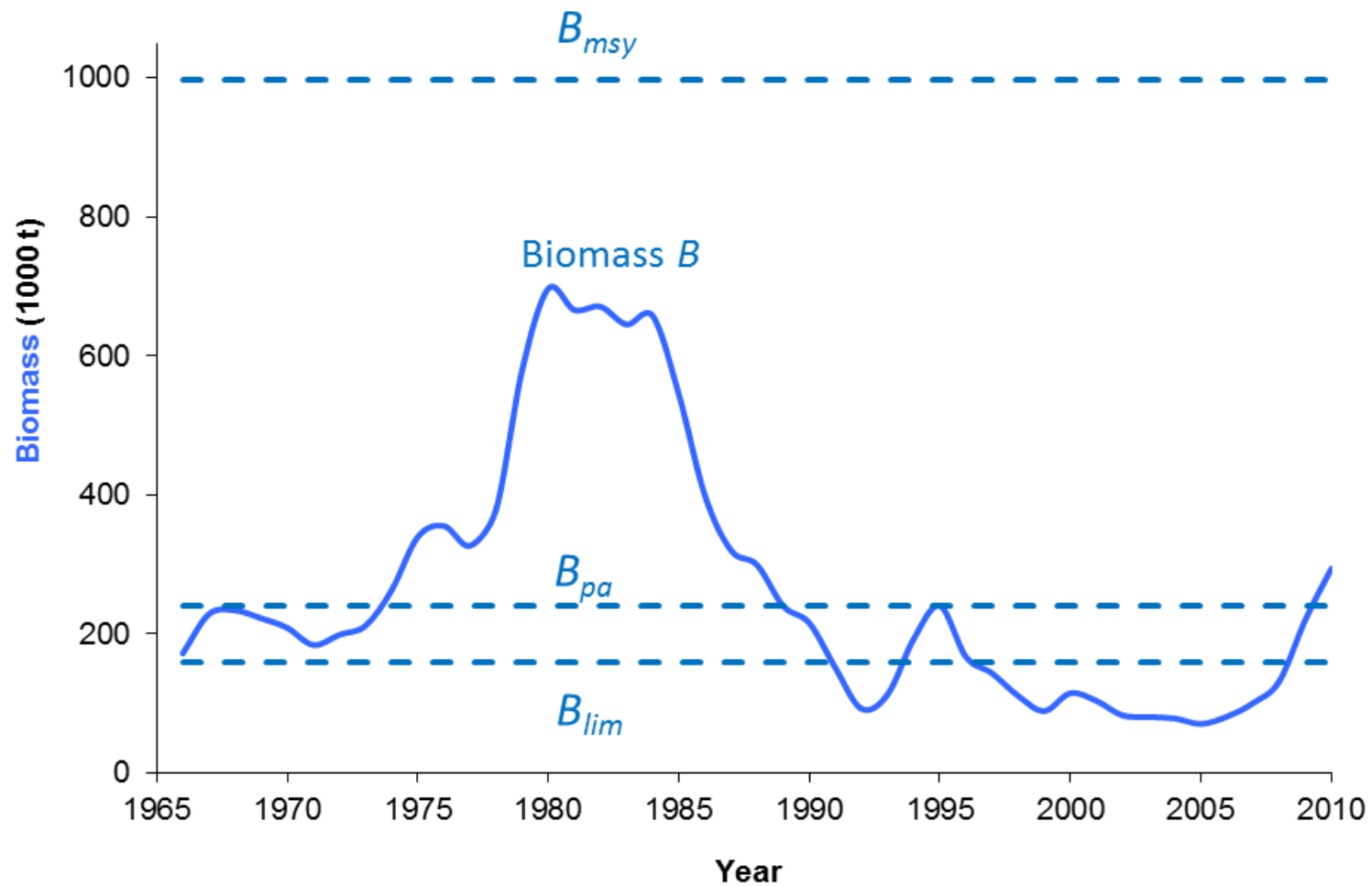
- Some terms
- Legal background
- Status of European and global Fish Stocks
- Towards healthy stocks
- Towards healthy profits
- Conclusions

# Some terms

- **Biomass ( $B$ )** is the weight of the fishes in the sea
- **Fishing mortality ( $F$ )** is an indicator of the proportion of fish killed by fishing
- **$MSY$**  is the maximum sustainable yield
- **$B_{msy}$**  is the biomass that can produce  **$MSY$**
- **$F_{msy}$**  is the fishing mortality resulting in  **$MSY$**  and  **$B_{msy}$**
- **$B_{lim}$**  is the biomass below which recruitment is reduced and collapse possible
- **$B_{pa}$**  is a biomass slightly above  **$B_{lim}$**  but far below  **$B_{msy}$**  ( $B_{pa} \sim B_{msy}$ -trigger)

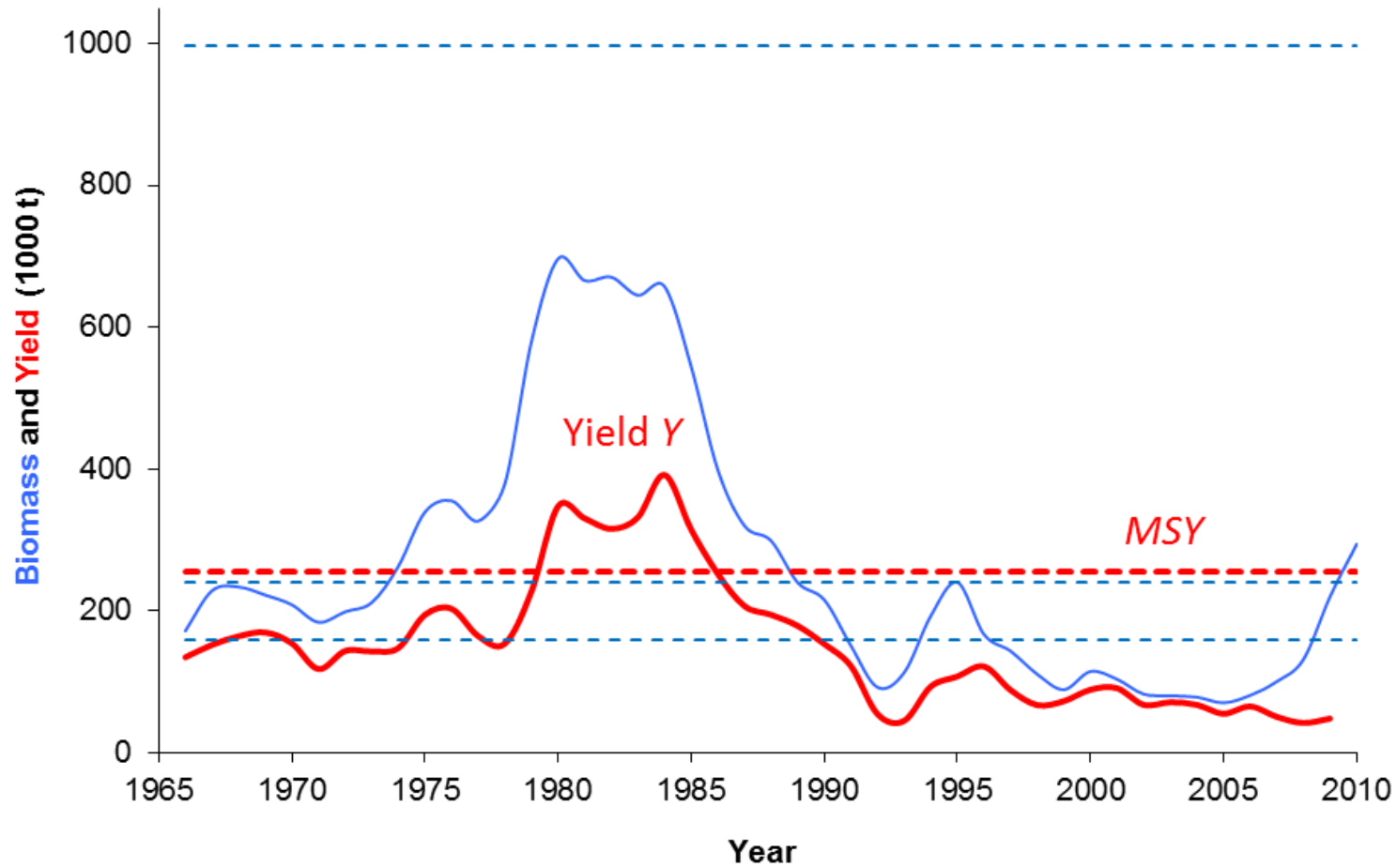
# Biomass Reference Points

## Cod, Eastern Baltic



# Yield Reference Points

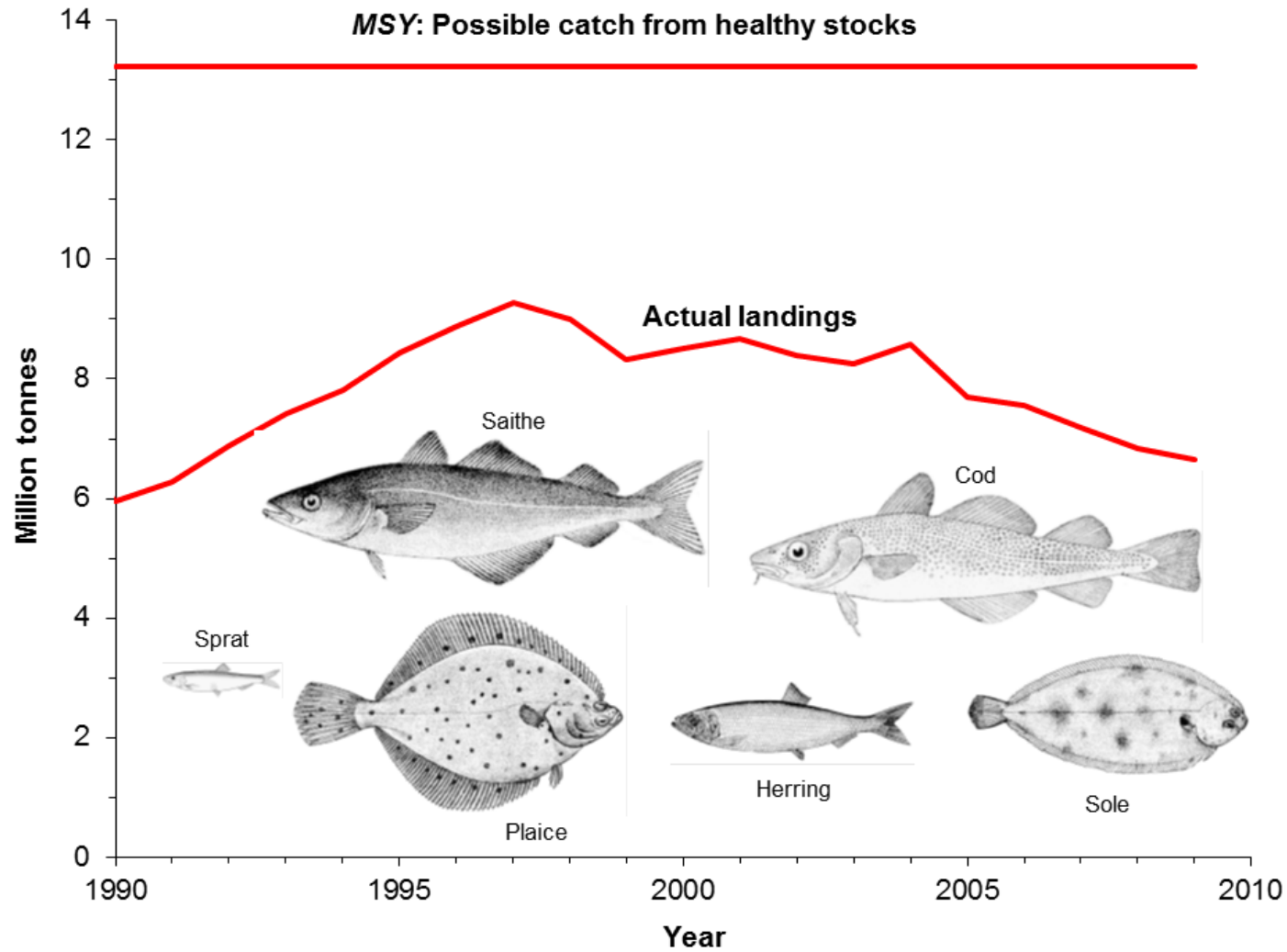
## Cod, Eastern Baltic



# Legal Background

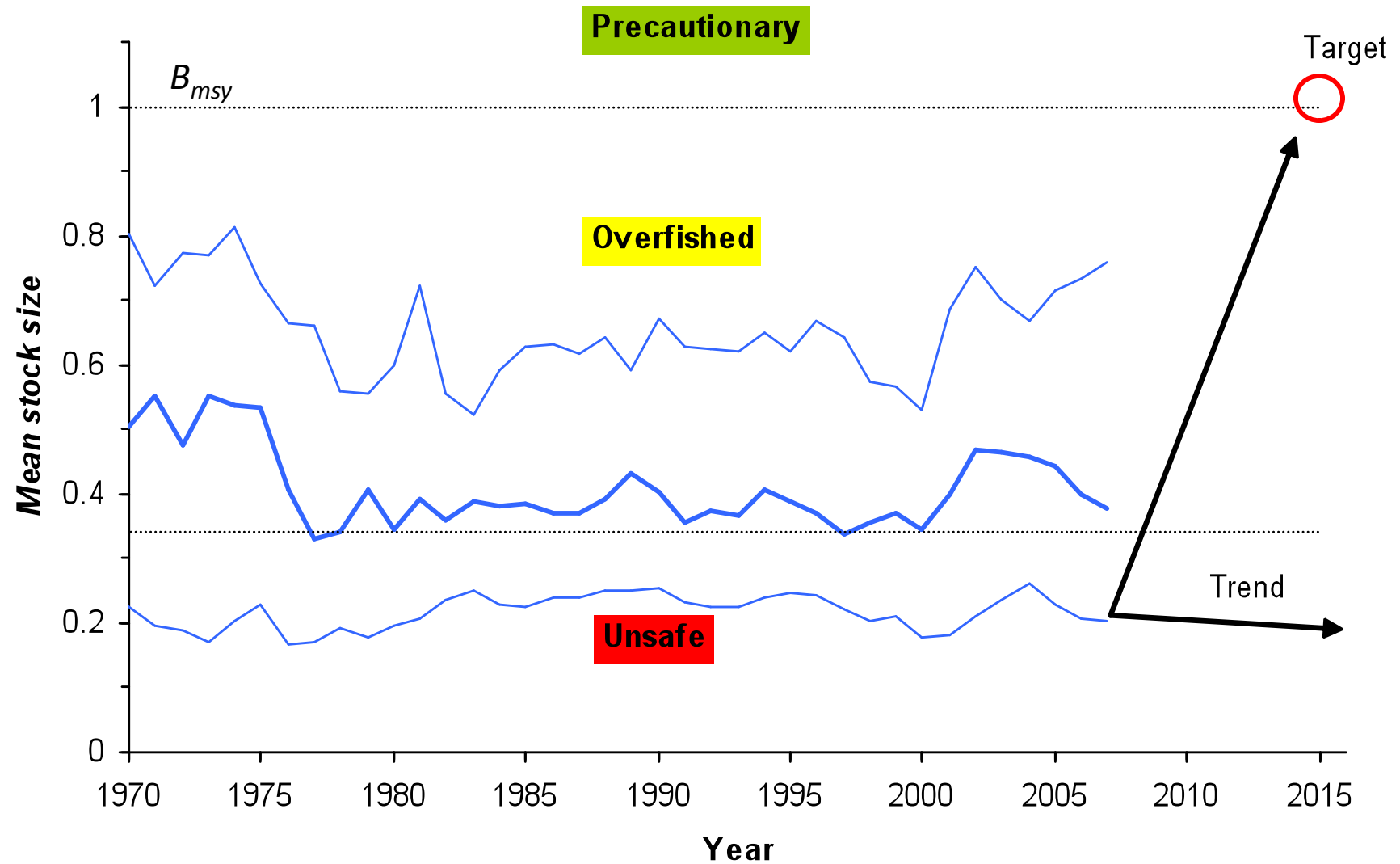
- The UN Convention on the Law of the Sea (UNCLOS 1982), Article 61(3), requires that coastal State fisheries management measures in the EEZ must aim at restoring and maintaining fish stock biomass that can produce maximum sustainable yields.
- The United Nations Fish Stock Agreement (UNFSA 1995), Annex II, specifies that after the rebuilding phase,  $F_{msy}$  is to be used as a limit reference point.
- The precautionary principle, as contained in the Treaty on the Functioning of the European Union, Article 191(2) and in UNFSA Article 6, demands that „States shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.“

# Status of European Fisheries



Actual and potential catch from 56 stocks in northern European waters Fishdrawings: FAO

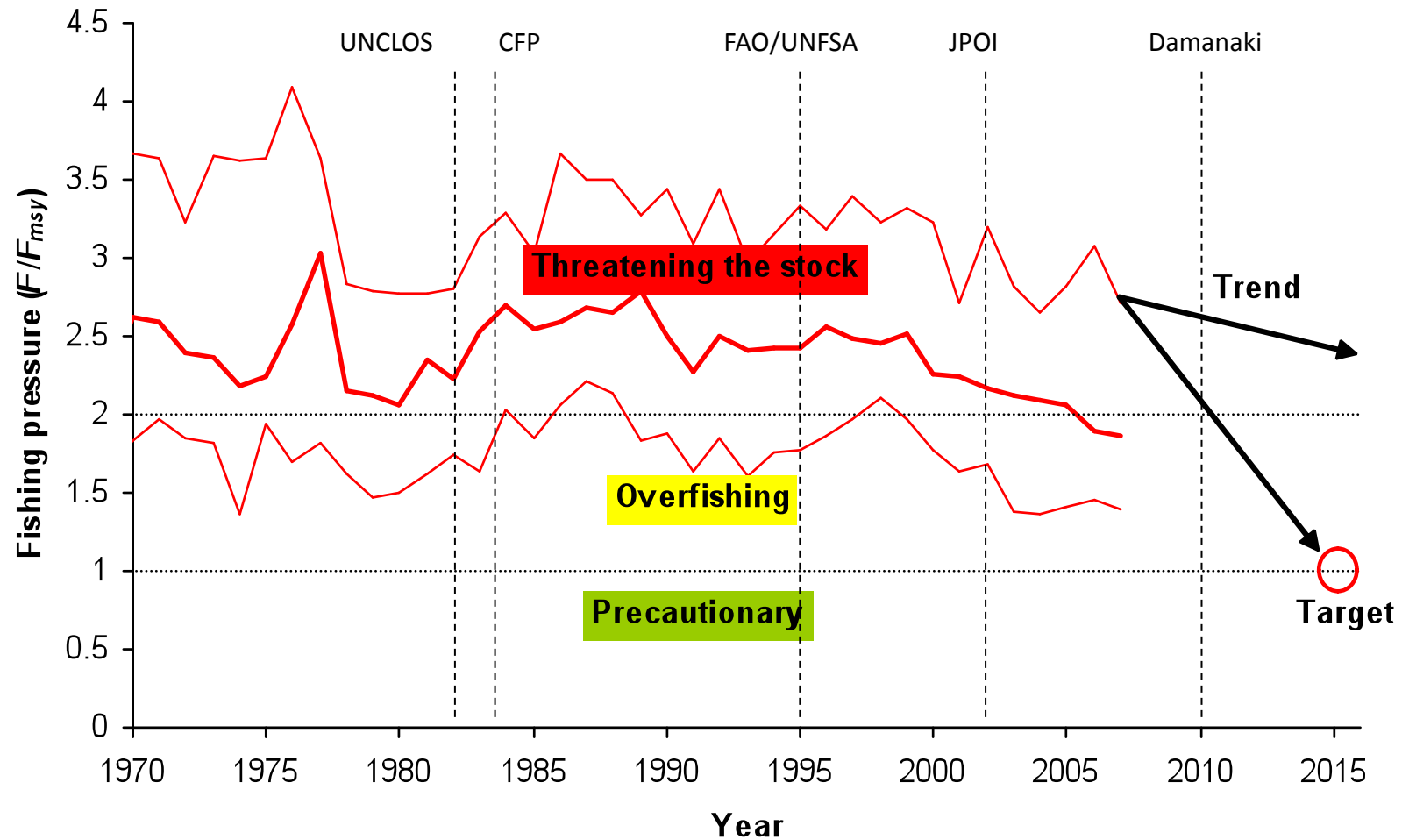
# Biomass of European Fish Stocks



Average size of European fish stocks (bold blue line). The upper arrow indicates the path, if 75% of the stocks were to reach the Johannesburg target in 2015. The lower arrow shows the current trend.

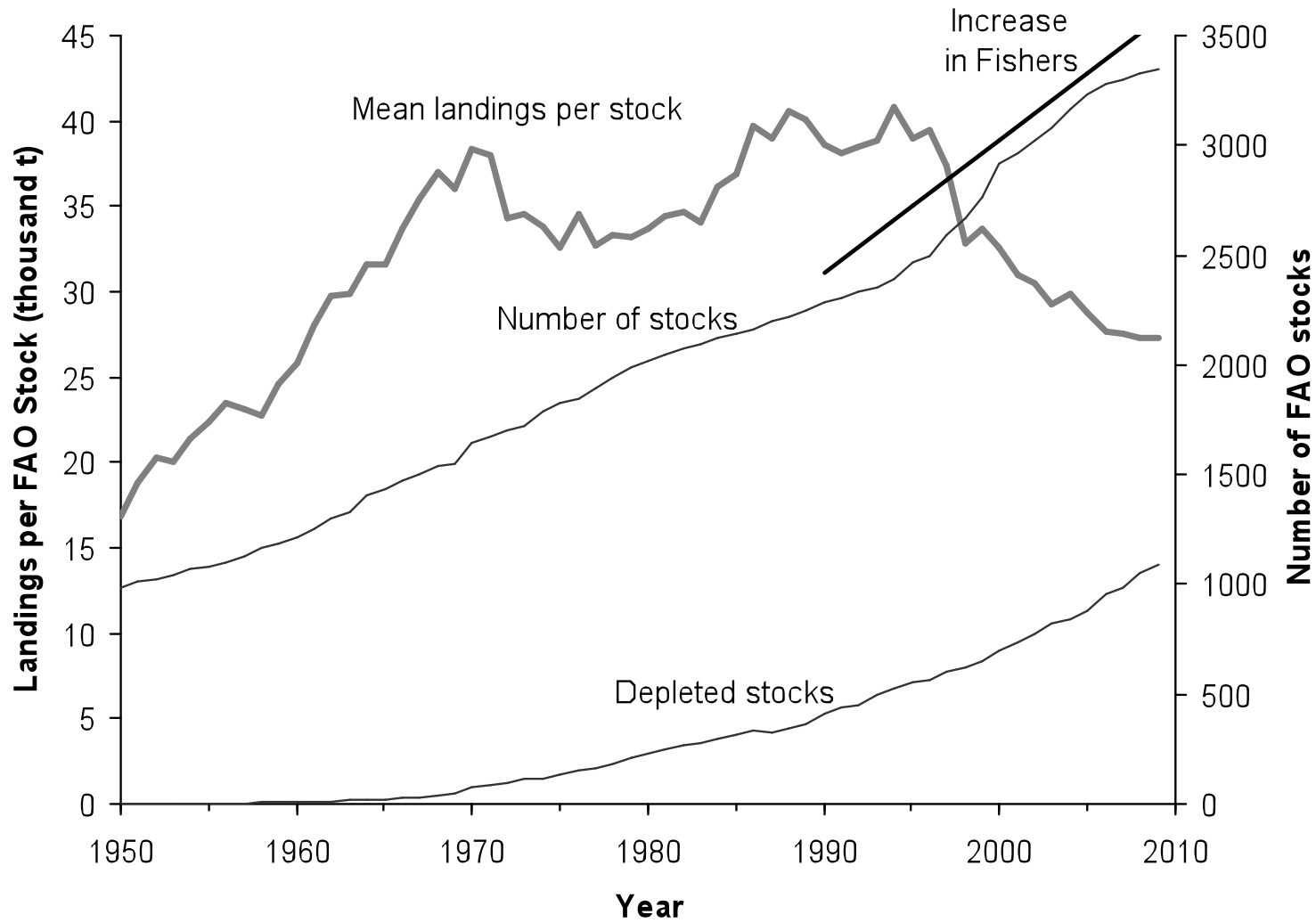


# Fishing Mortality of European Fish Stocks



Average fishing pressure on European fish stocks. The lower arrow indicates the path if 75% of the stocks were to be fished at the maximum sustainable rate in 2015. However, with the trend since 2000, that target will be missed by more than 30 years.

# Status of Global Fisheries



# Why Should Europe Care about Global Fisheries?

- 42% of the global trade in fish and fish products is imported by the Europe
- A CFP reform that correctly implements UNCLOS and UNFSA, such as done by USA, NZ and AUS, will force others to follow
- A failed CFP reform will encourage continued overfishing, in Europe and globally
- US\$ 1.2 billion European fish exports into the USA will be endangered

# Towards Healthy Fish Stocks

# FISH and FISHERIES



FISH and FISHERIES 2010

## **Generic Harvest Control Rules for European Fisheries**

Rainer Froese, Trevor A. Branch, Alexander Proelß, Martin Quaas,  
Keith Sainsbury & Christopher Zimmermann

Nine simple rules for European fisheries management resulting in

- 1) Economic optimization of the fishery
  - 2) Adherence to UNCLOS and UNFSA
  - 3) True implementation of the precautionary principle
  - 4) Building on international experience
  - 5) Progressing towards ecosystem based management
  - 6) Compatible with the biology of European fish stocks
- Under these rules, stocks can be four times larger and catches 63% higher, on average, compared to current levels.

# HCR 1: Reference and Trigger Biomass

The reference biomass  $B_{msy}$  for the subsequent rules and reference points is the biomass that can produce the maximum sustainable yield.

This biomass also acts as a trigger when stocks fall below this level.

## HCR 2: Target Biomass

The target biomass, to be achieved on average over approximately 5 years, is 1.3 *Bmsy*.

The target biomass can be increased as required by economic, ecosystem or other considerations.

## HCR 3: Limit Biomass

The limit biomass  $B_{lim}$ , which is to be avoided with a high probability, is  $0.5 B_{msy}$

A higher biomass limit may be set for species with low resilience to exploitation.



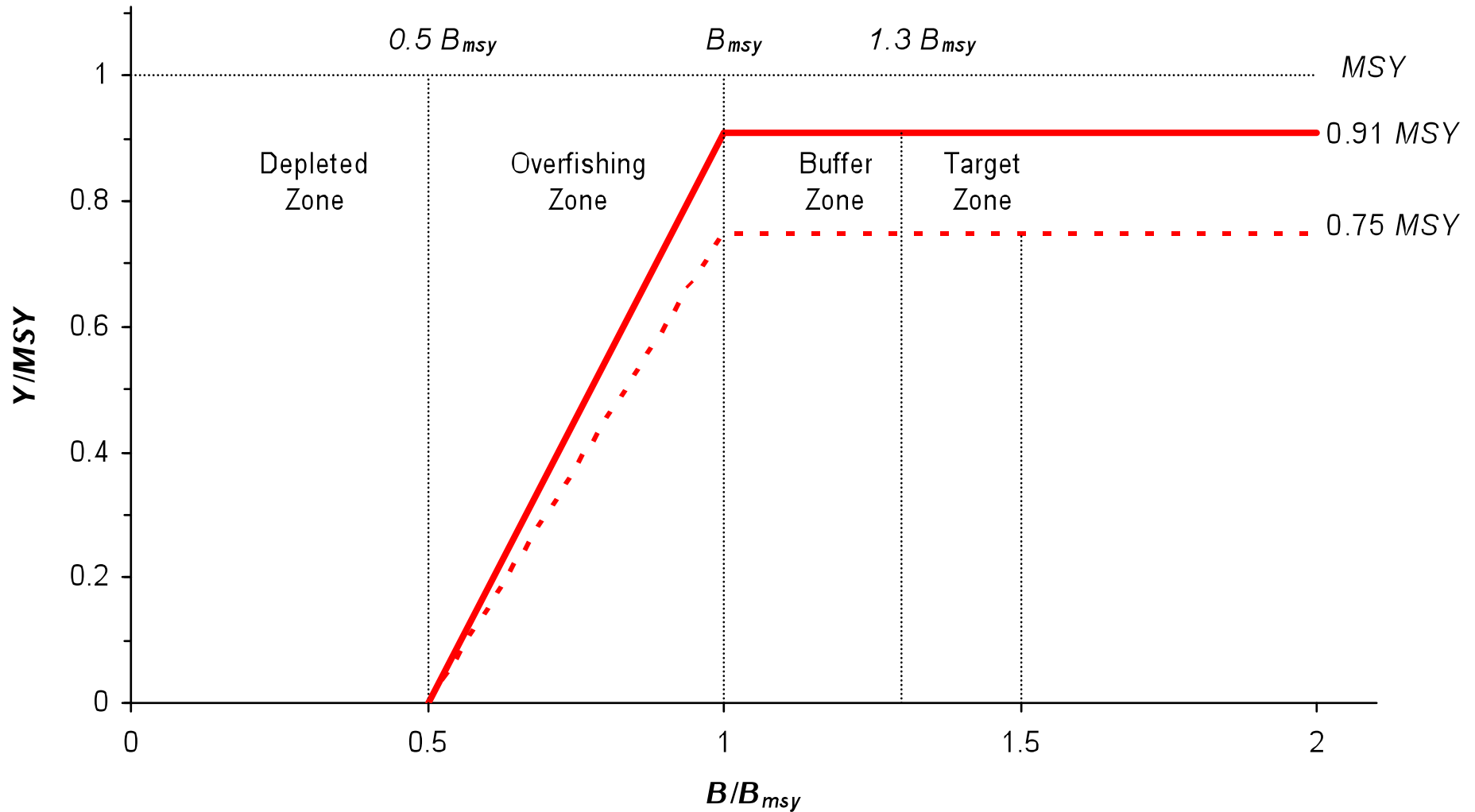
# HCR 5: TAC Reductions

If the biomass falls below  $B_{msy}$ , then the TAC is linearly reduced, as a function of biomass, to reach zero catch at  $B_{lim}$ .

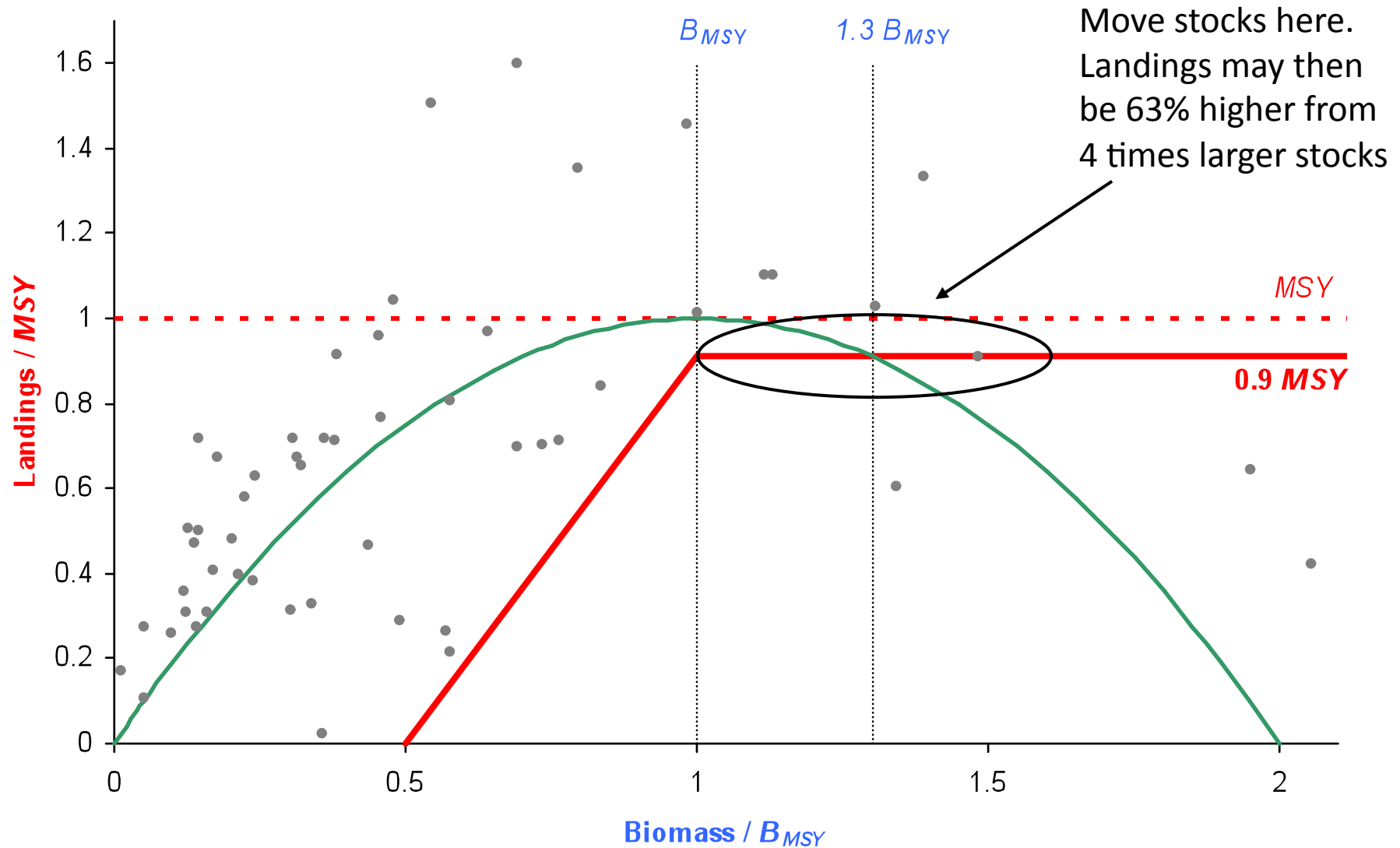
# HCR 9: Size structure

The mean size and age in the catch will be adjusted to minimize changes in age structure caused by fishing and to reduce the effects of fisheries-induced unnatural selection.

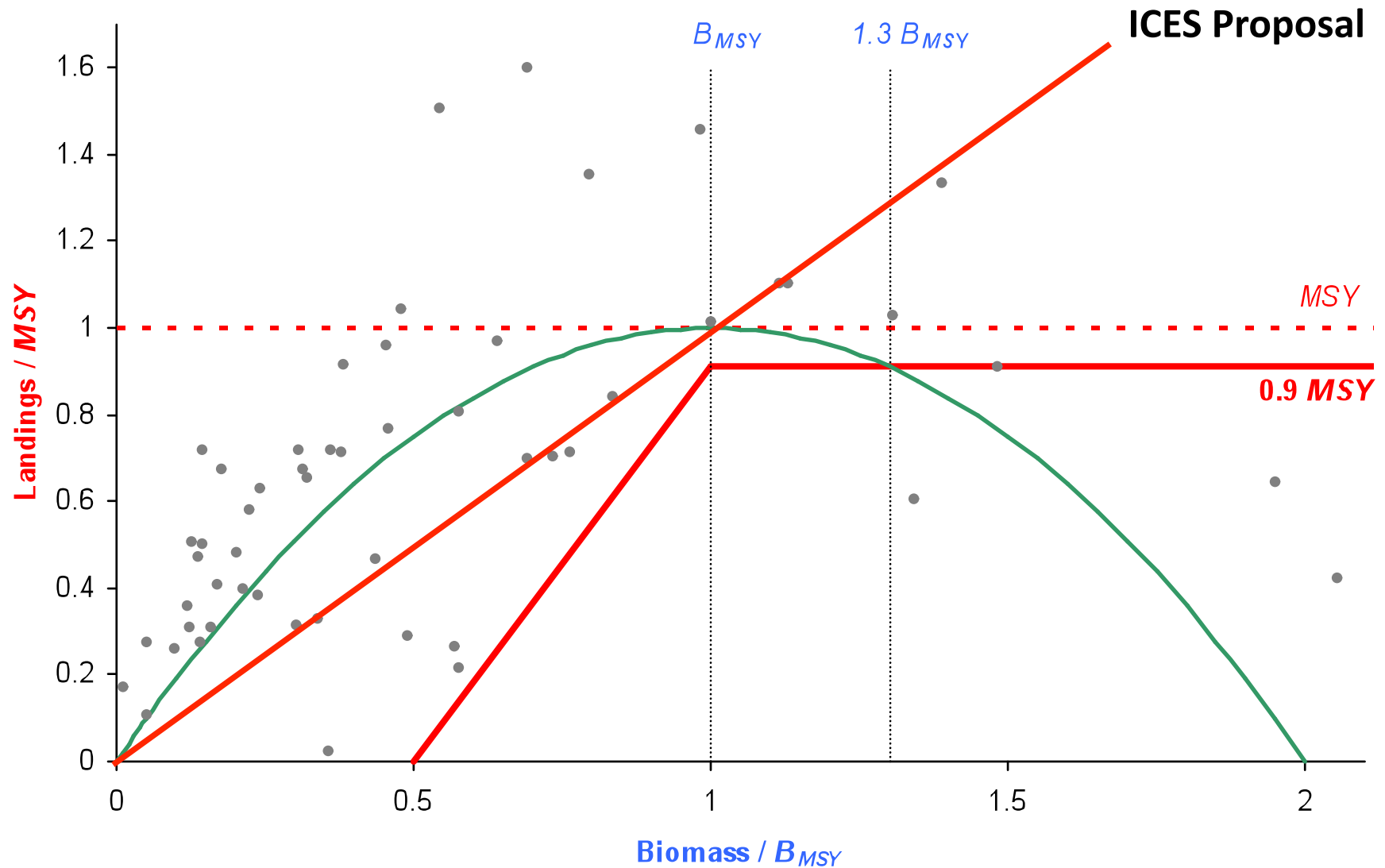
# Proposed Harvest Control Rules



# Status of European Stocks



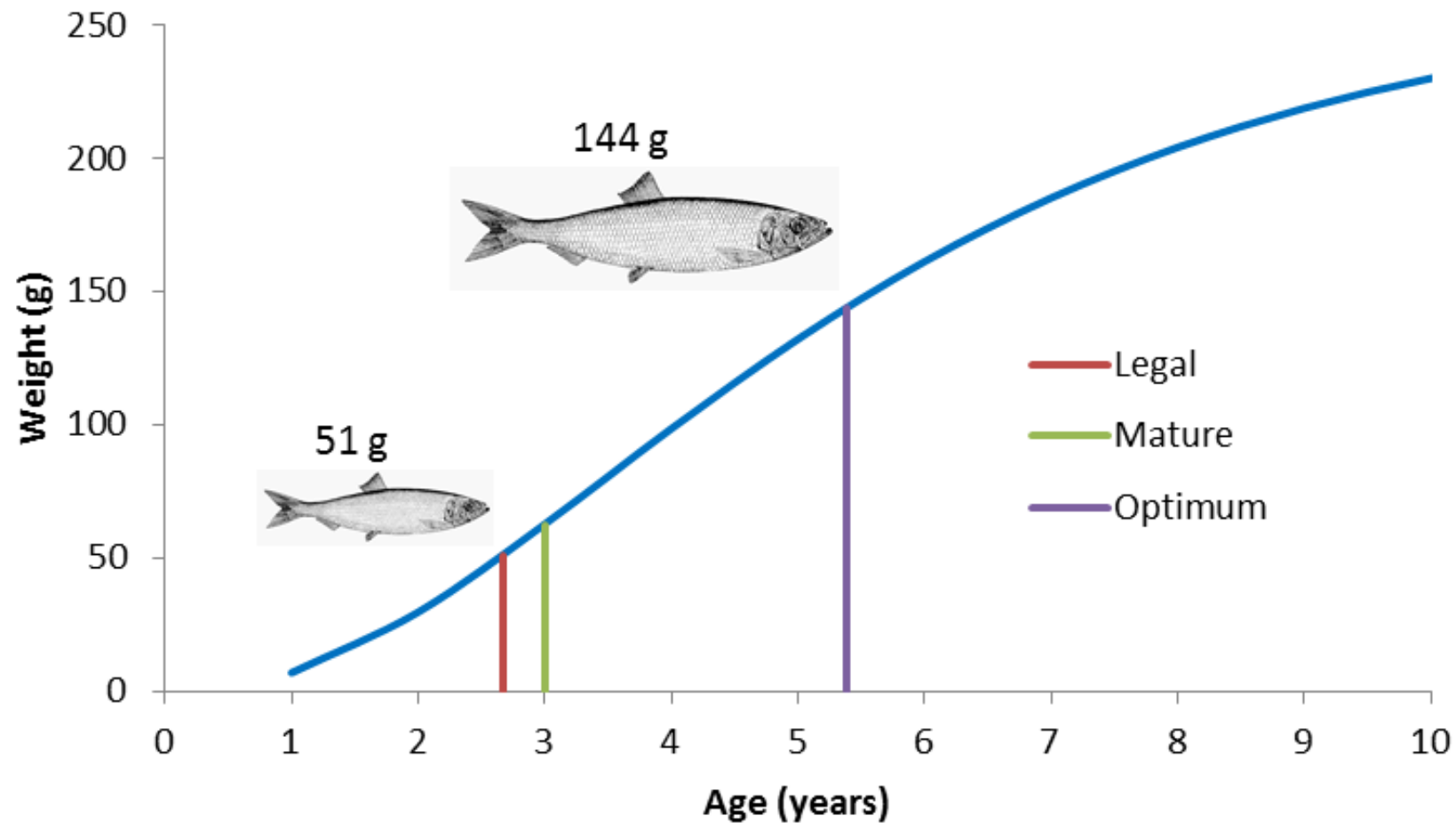
# Status of European Stocks



# Towards Healthy Profits

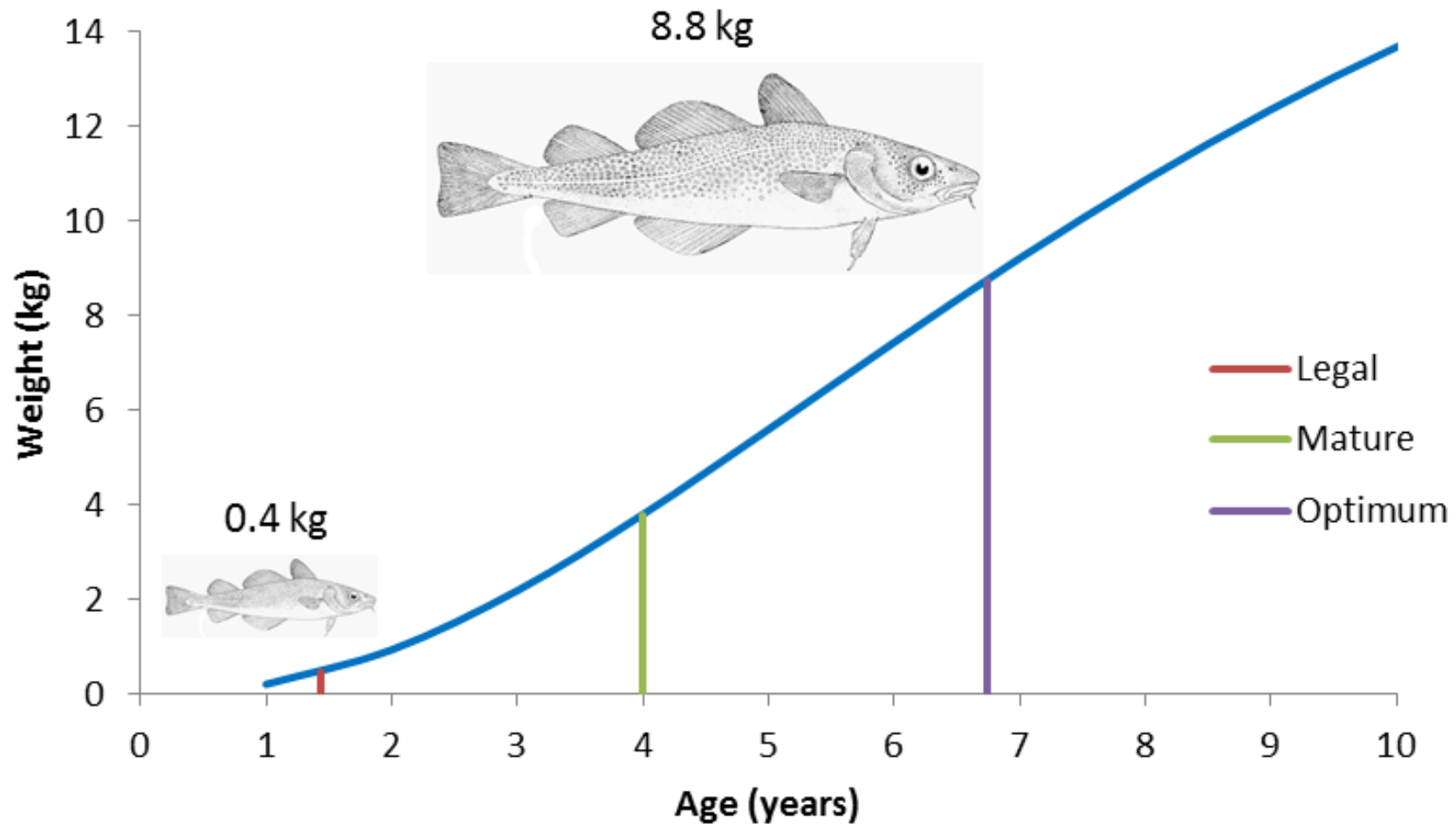
# Growth Overfishing is Stupid

## North Sea Herring



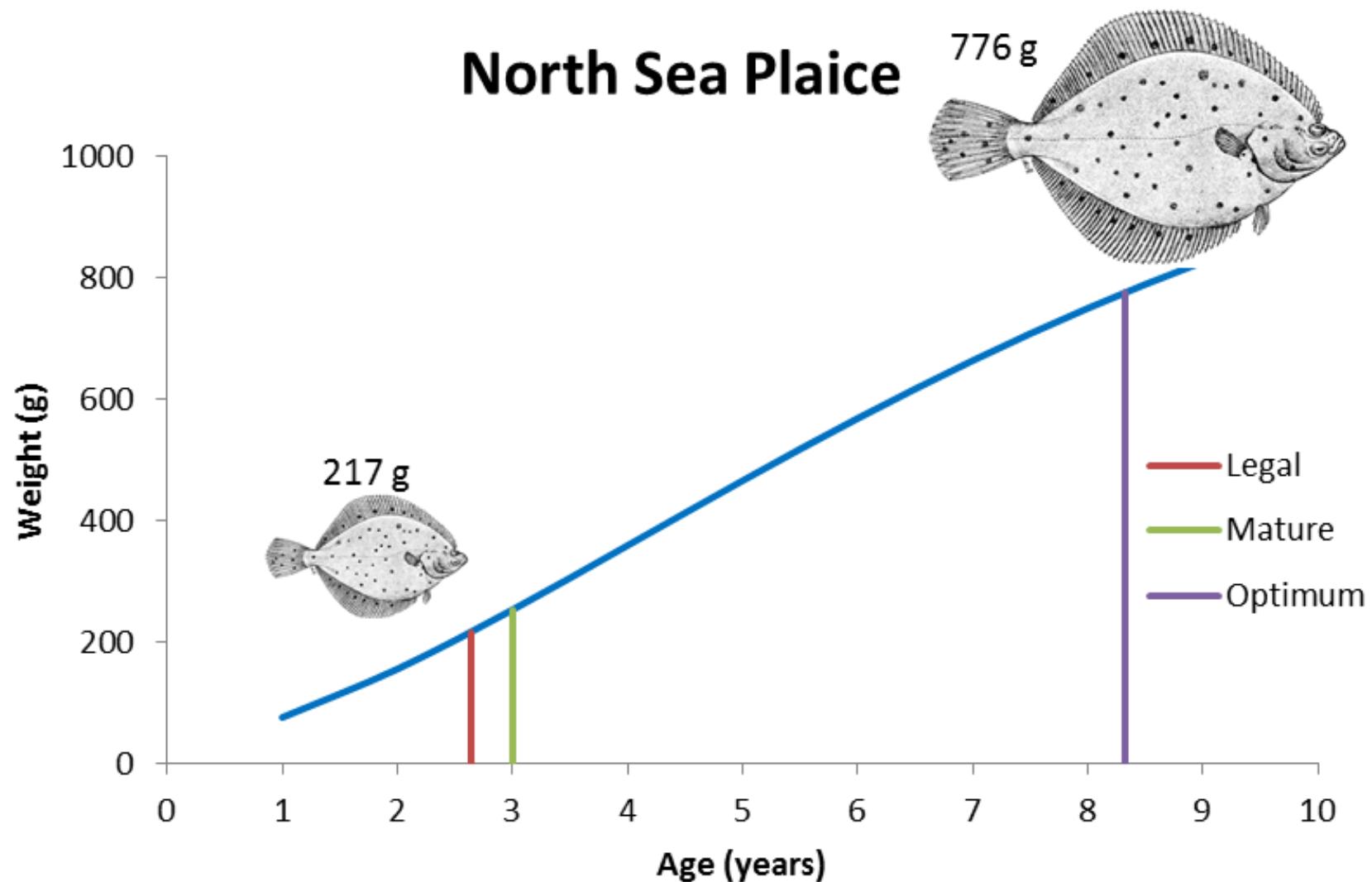
# Killing Juveniles is Stupid

## North Sea Cod





# Letting Fish Grow is Smart



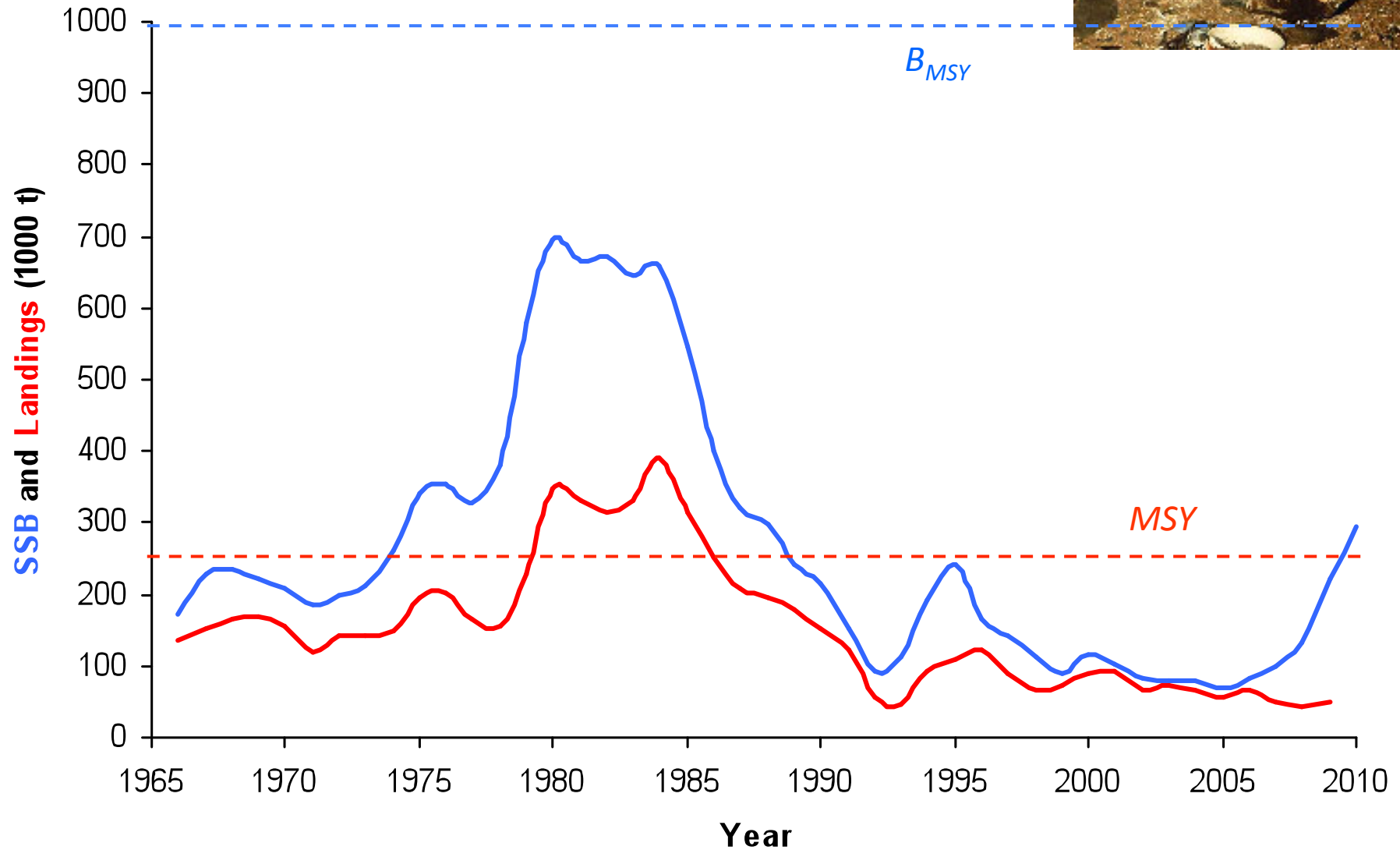
MARINE ECOLOGY PROGRESS SERIES, Submitted

**Making a Miracle Come True:  
Three Options for Rebuilding the Cod Stock in the Eastern Baltic Sea**

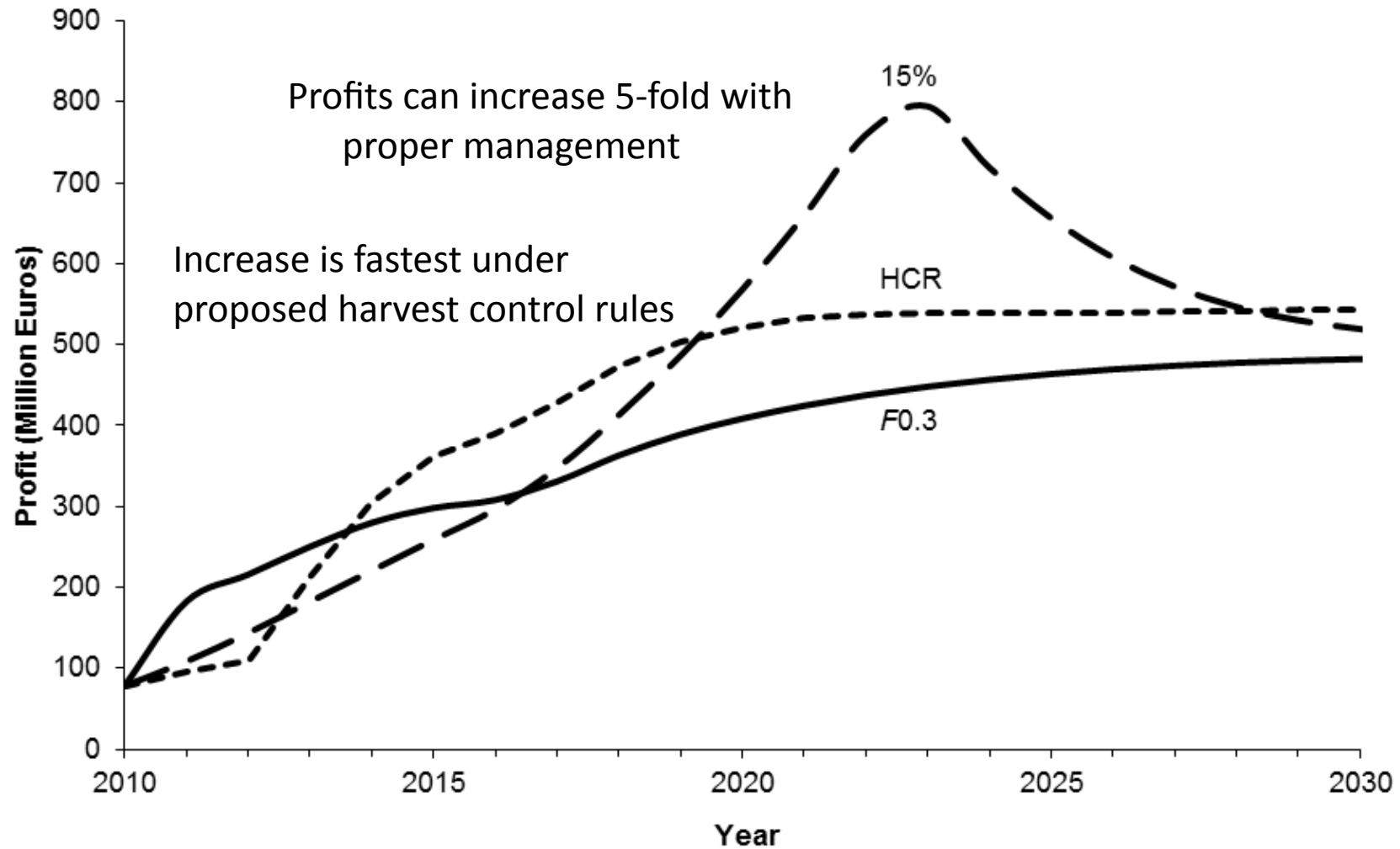
Rainer Froese & Martin Quaas

- We compared a request by fishers with current management and with the rules proposed by Froese et al. 2010
- The rules would rebuild and maintain the stock above  $B_{msy}$  and provide the highest profits over the next 10 years

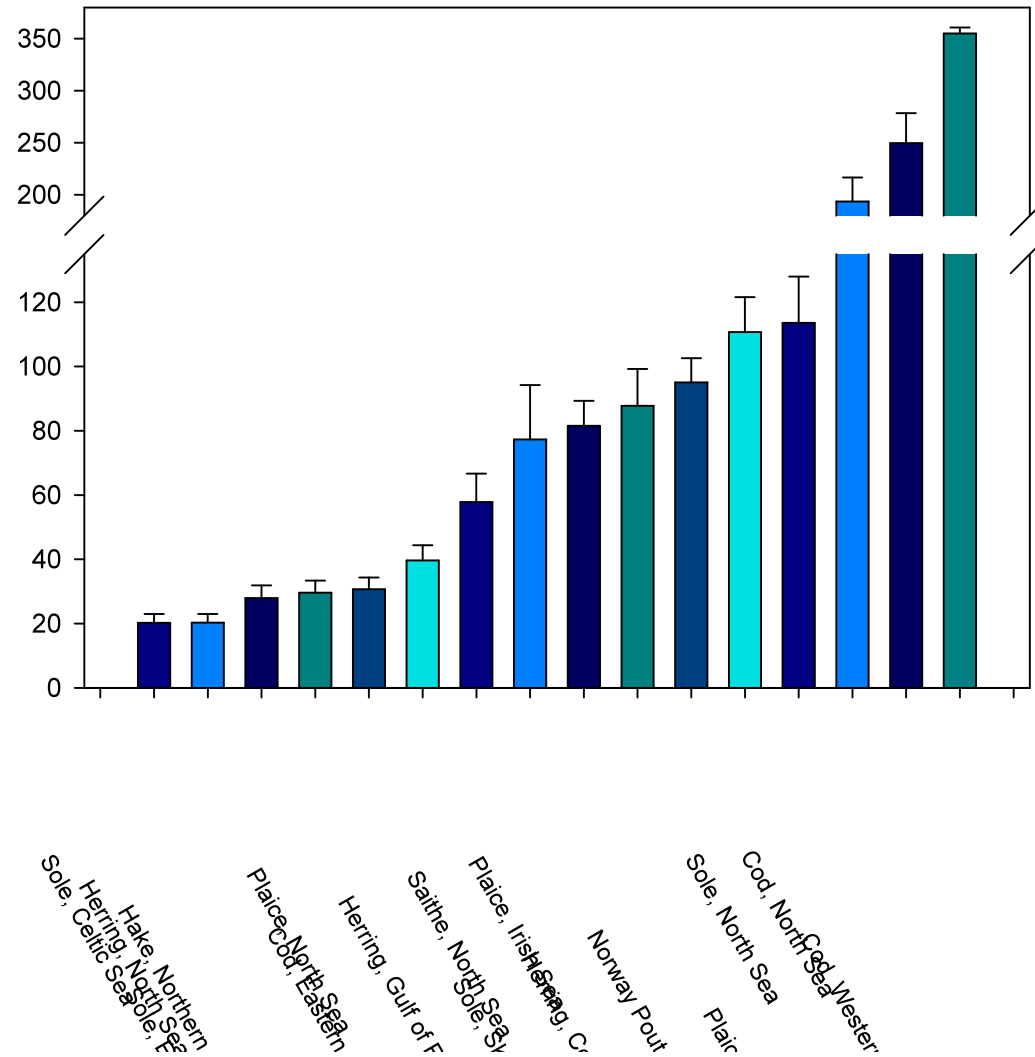
# Cod, Eastern Baltic



# Expected Profits under Three Scenarios



# Investing in the Resource is Smart



Economic return of setting the 2009 TAC to zero and resume fishing at  $F_{mey}$  in 2010.  
 Quaas et al in prep.

# Conclusions

- Getting the CFP reform right is of European and of global importance
- European fish stocks are underperforming assets
- Investing in larger stock sizes leads to improved ecosystems status, healthy stocks, healthy fisheries and healthy profits

# Thank You

Rainer Froese  
IFM-GEOMAR  
rfroese@ifm-geomar.de