



DIRECTORATE OF FISHERIES

# Rebuilding the Stock of Norwegian Spring Spawning Herring

## Lessons Learned

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Foto: Rolf Vik



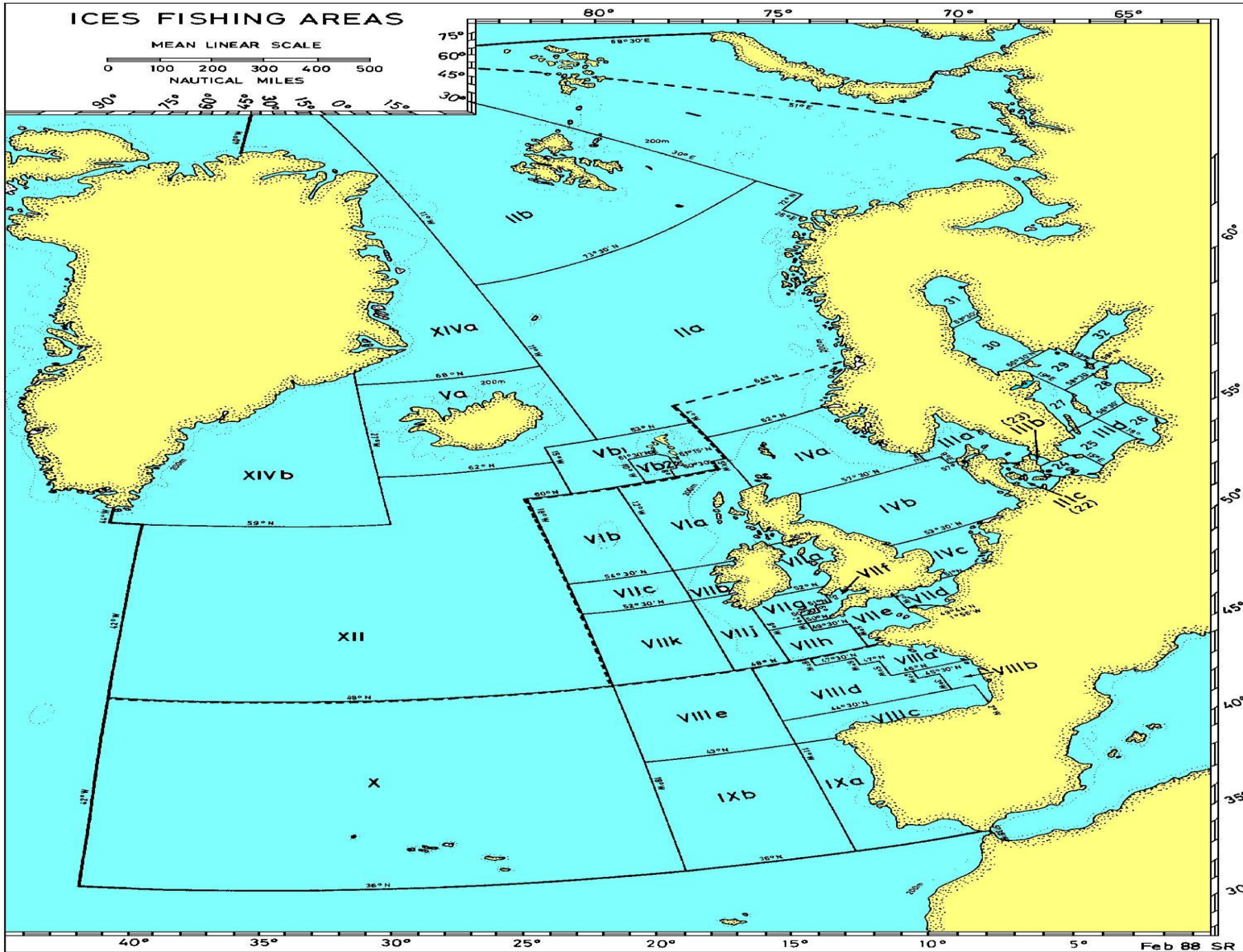
## Outline of Presentation

- **Stock Distribution**
  - Definition of the stock
- **Stock Fluctuation (SSB)**
  - Collapse
- **Role of RFMO**
- **Three main questions related to regulation of the stock**
- **Regulatory measures, focus on periods**
  - 1950 – 1970
  - 1970 – 1990
  - 1990 – 2008
- **Conclusions - Lessons Learned**

# ICES FISHING AREAS

MEAN LINEAR SCALE

0 100 200 300 400 500  
NAUTICAL MILES





80°

75°

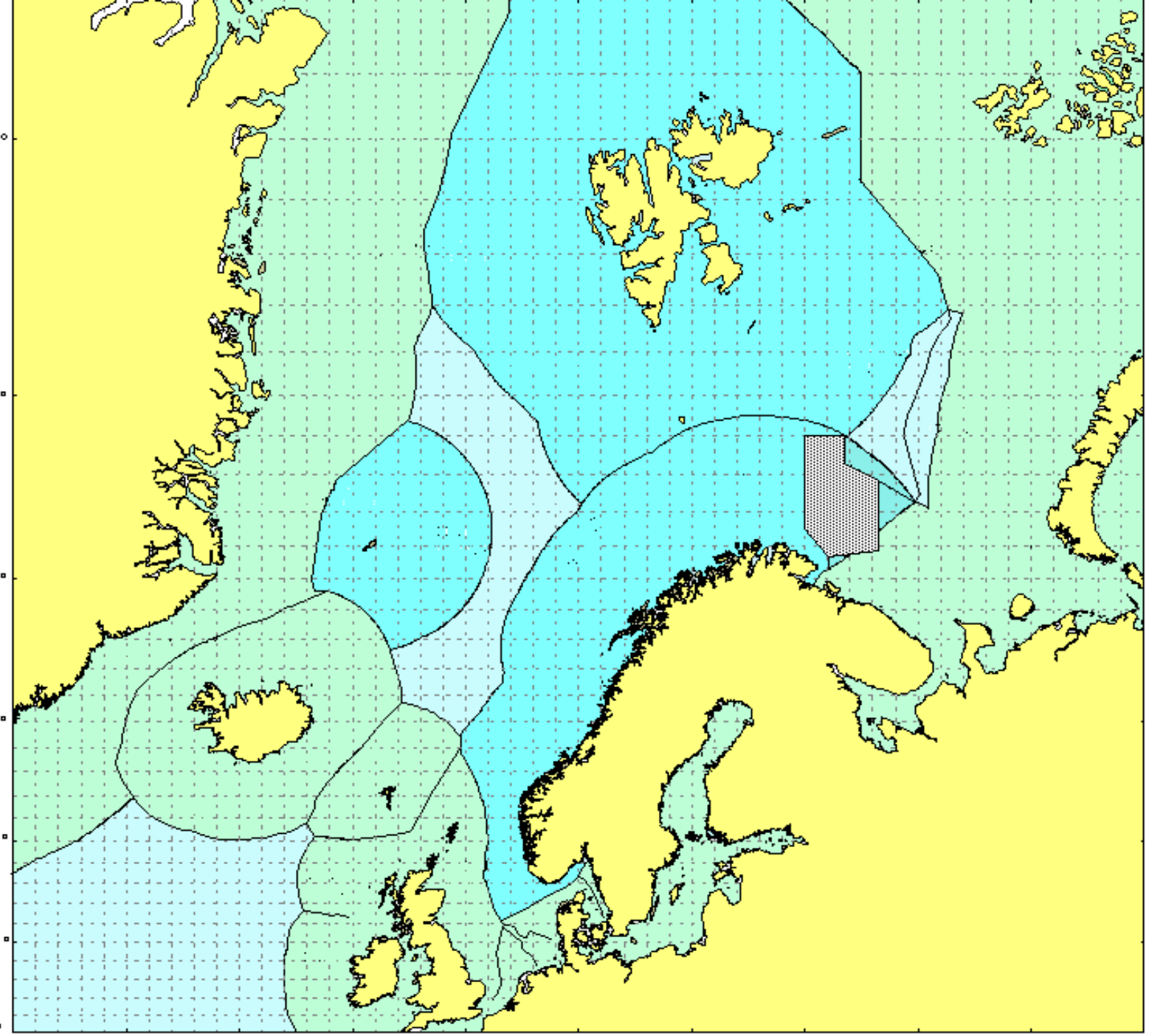
70°

65°

60°

55°

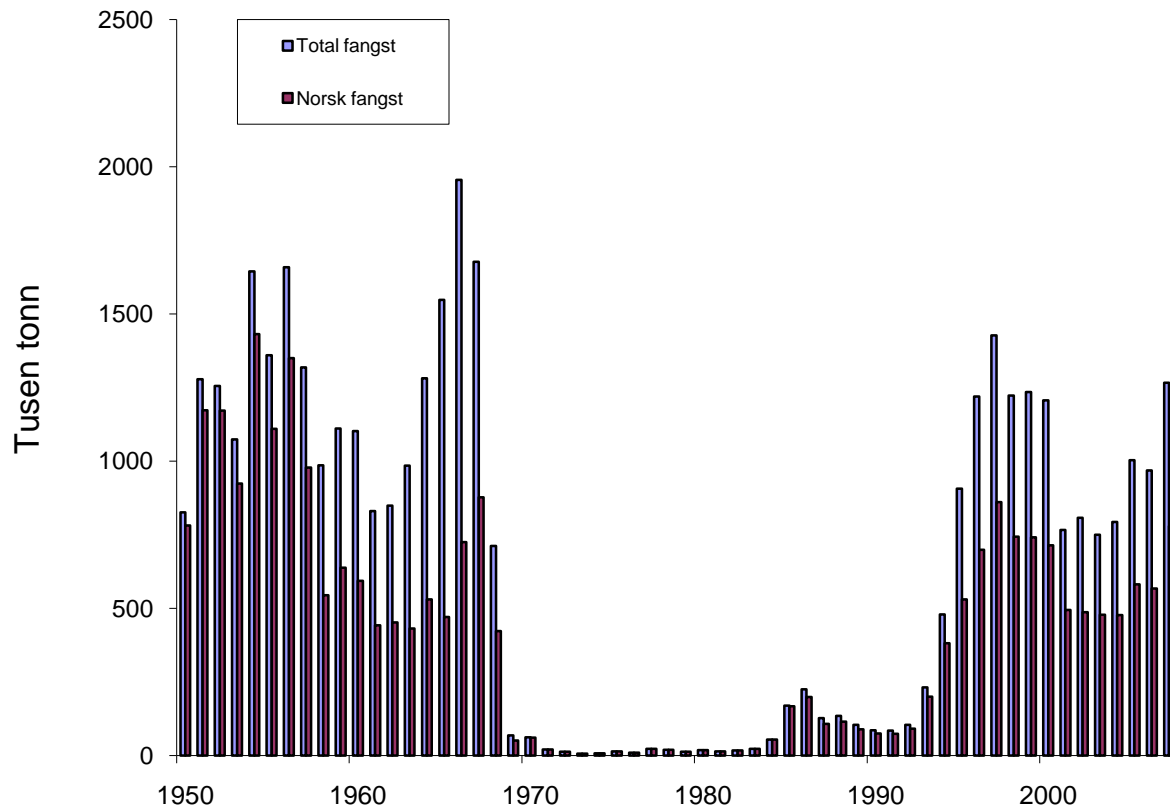
50°



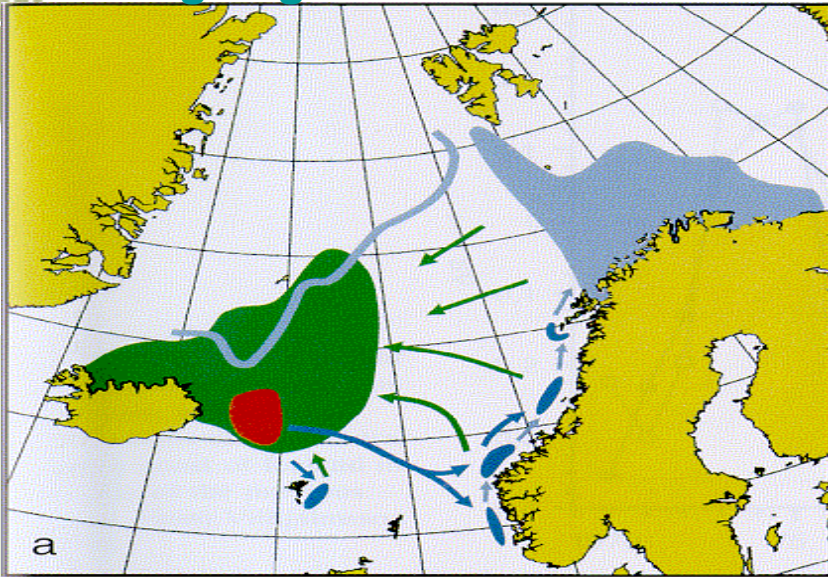
40° 30° 20° 10° 0° 10° 20° 30° 40° 50° 60°



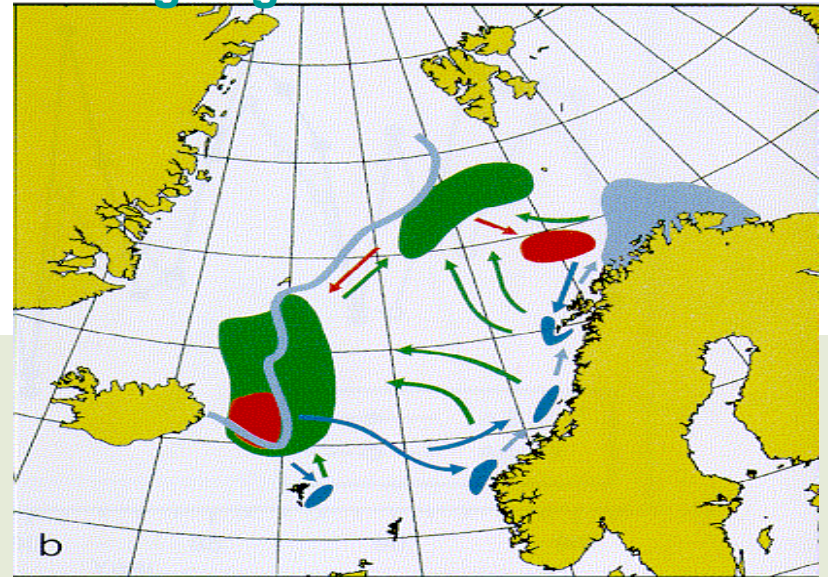
# CATCHES



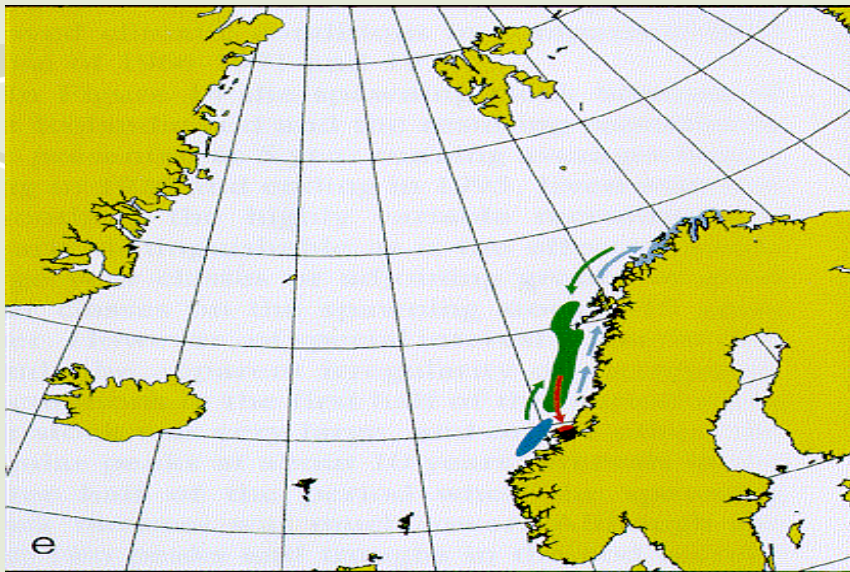
Herring migration - "traditional"



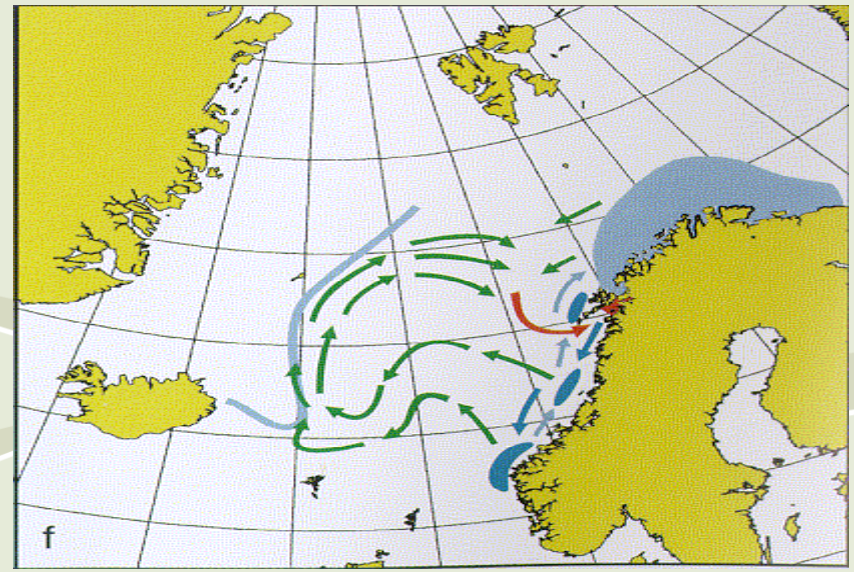
Herring migration 1965 - 66



Herring migration 1972 - 86



Herring migration 1995-99



## Three Fundamental Questions

1. **What was done to prevent the decline of the stock towards the end of the 1960s?**
2. **What were the main regulatory measures implemented when the stock was down?**
2. **What has been done to avoid a new collapse of the stock?**



## **The period 1950 - 1970**

**INSTITUTIONS:** Open Access, No 200 mile Exclusive Economic Zone

**MAJOR PLAYERS:** Norway, USSR, Iceland and the Faroe Island

**RFMO:** Permanent Commission from 1953, NEAFC from 1963

### **DISCUSSIONS IN NEAFC:**

**USSR representatives drew attention to serious decline of the stock in 1968**

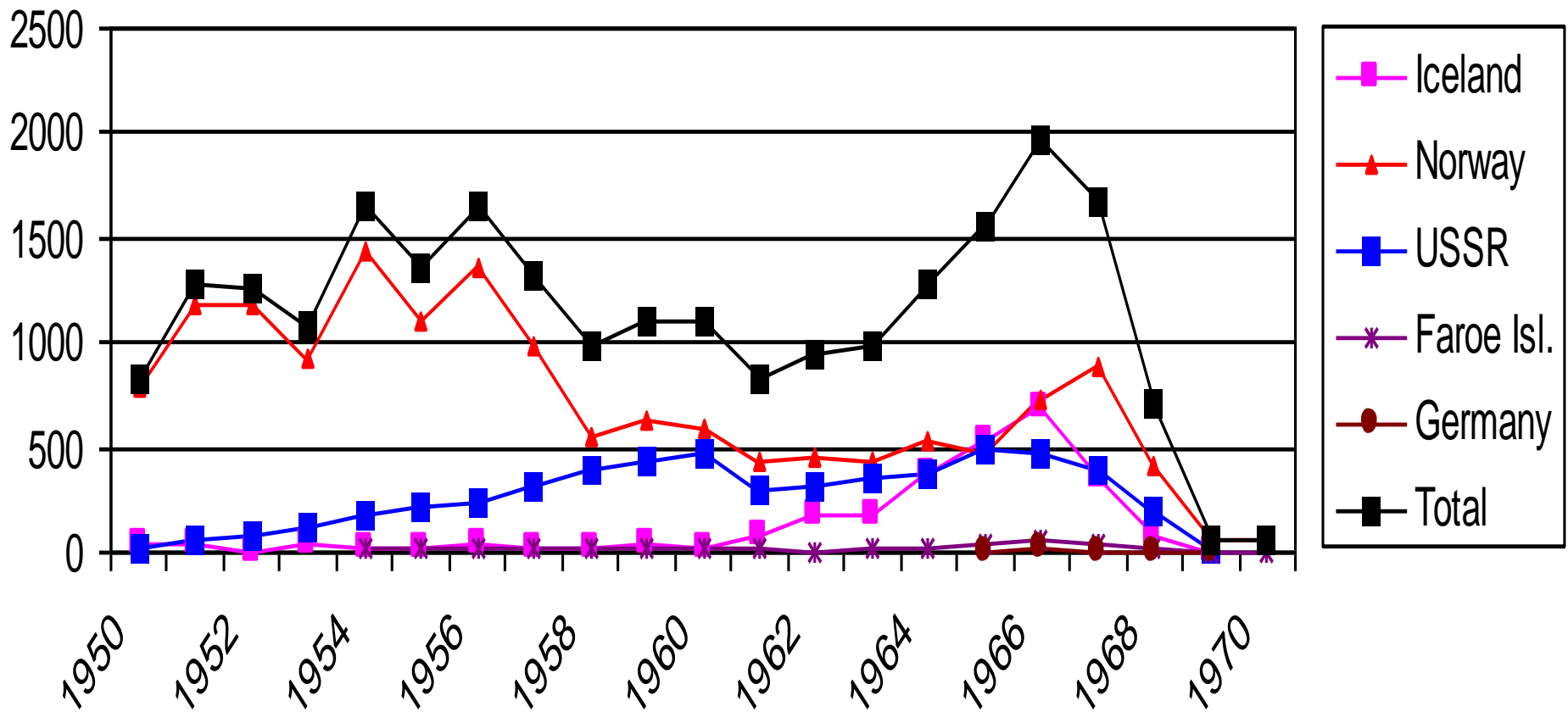
**A special ad hoc studygroup was in 1969 given the task to examine ICES advise**

**Minimum fish size and total quotas were discussed but not implemented**

- **Highest catch ever recorded in 1966**
- **Total collapse of the stock in 1970**



## Catches during the period 1950 - 1970





## The period 1970 - 1990

### INSTITUTIONS

200 mile EEZ established from 1977

Stock continue to live close to the Norwegian shores

### ACCKNONOWLEDGE THE COLLAPSE:

1. The fishery directed at small herring was detrimental to the development of the stock

Growth potential not utilized, and contribution to spawning stock prevented

***GROWTH OVERFISHING***

2. The total outtake was clealy unsustainable. ***RECRUITMENT OVERFISHING***

### REGULATORY MEASURES OR REMEDIES:

ESTABLISH MINIMUM FISH SIZE

RESTRICT OVERALL CATCHES



## Turning point

- 1983 first strong year class in 20 years
- The stock remained within the Norwegian waters

### National measures to rectify Growth Overfishing:

Minimum landing size of 25 cm implied a ban on the fishery of small herring, which during 1950 – 1970 period constituted 33% of the total Norwegian catch.

### National measures to rectify Recruitment Overfishing:

Precautionary TAC was established

TAC based on fixed fishing mortality of 0.05



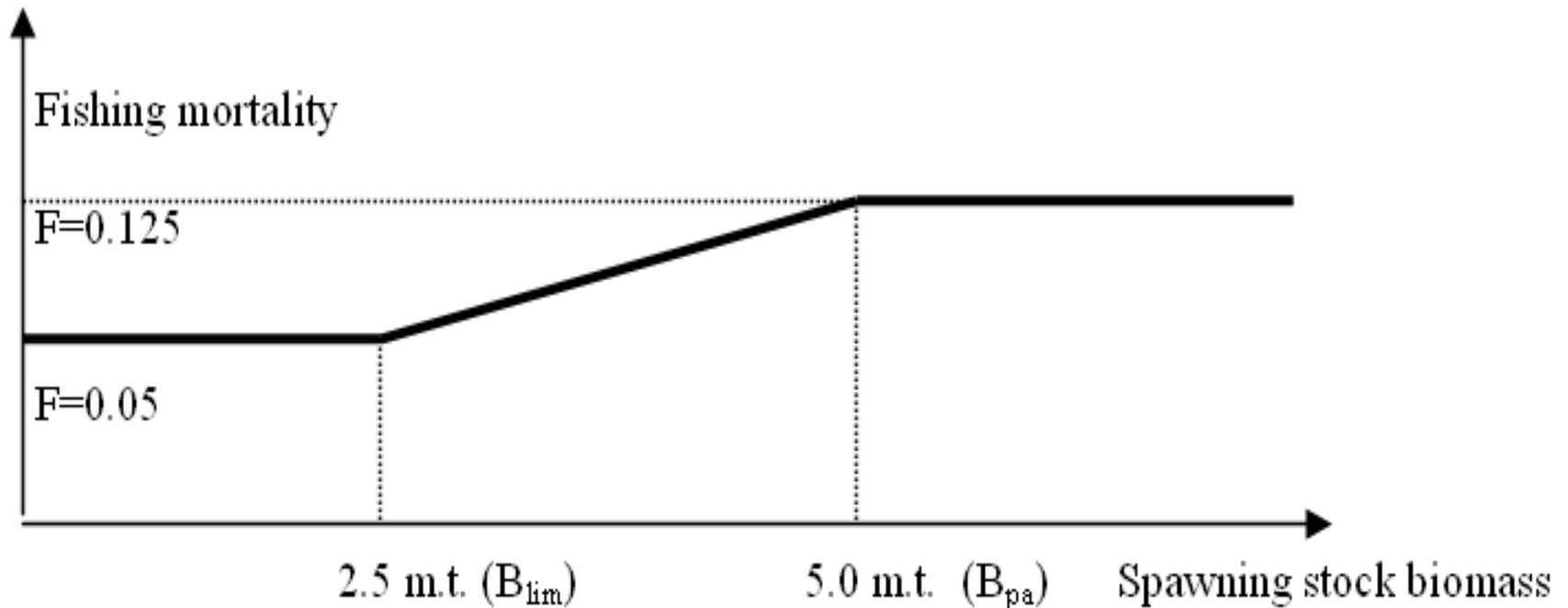
## The period 1990 – 2008

- The SSB exceeded B<sub>Lim</sub> level of 2.5. million tonnes
- New good yearclasses at the beginning of the period
- NSSH started to migrate outside the Norwegian EEZ

**NEED TO ESTABLISH HARVEST CONTROL RULE**

**AGREE ON HOW TO DIVIDE THE HARVEST AMONG PARTICIPATING STATES**

## Harvest Control Rule for NSSH



**Figure 3**

**Coastal states agreement on Harvest Control Rule for NSSH**

## Development of the stock

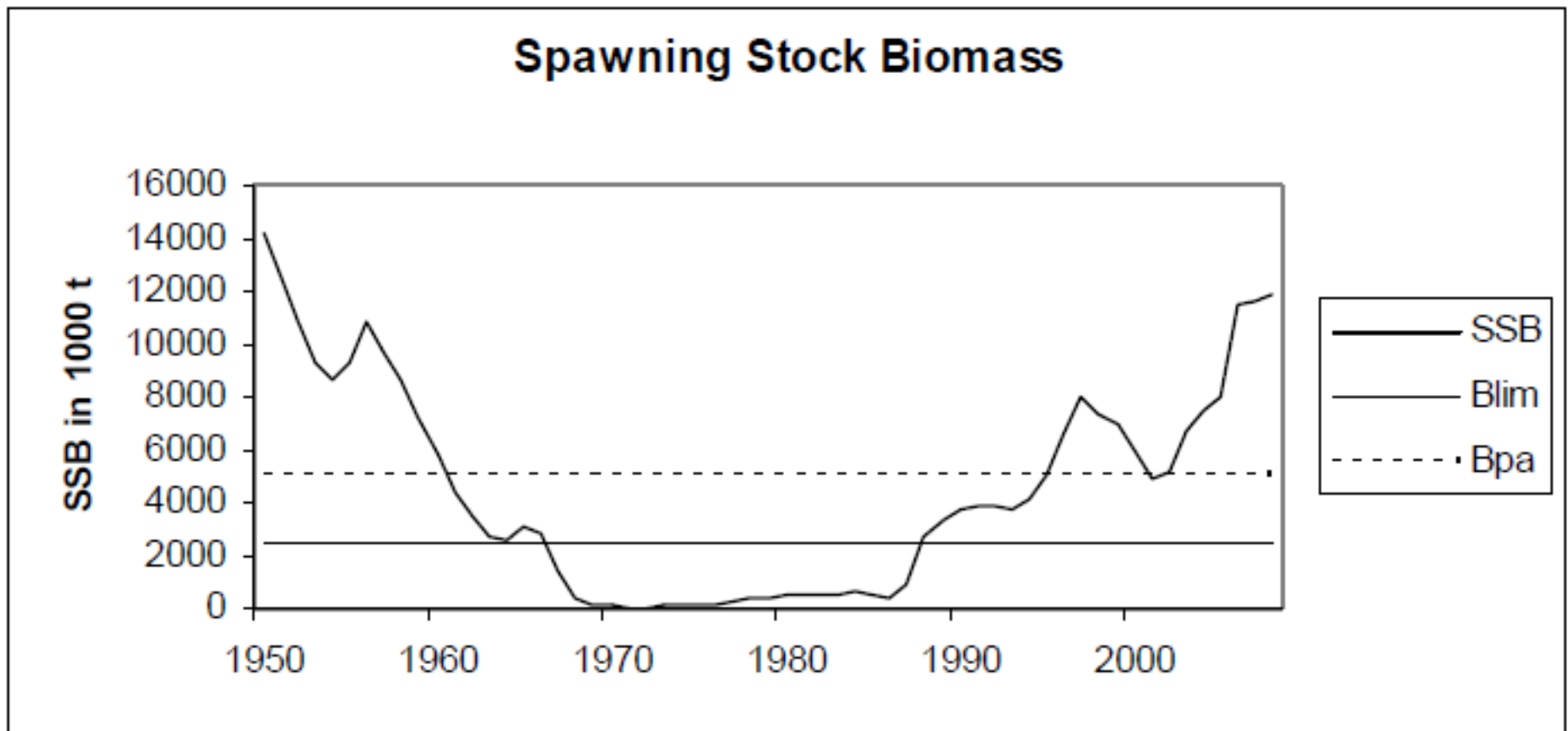
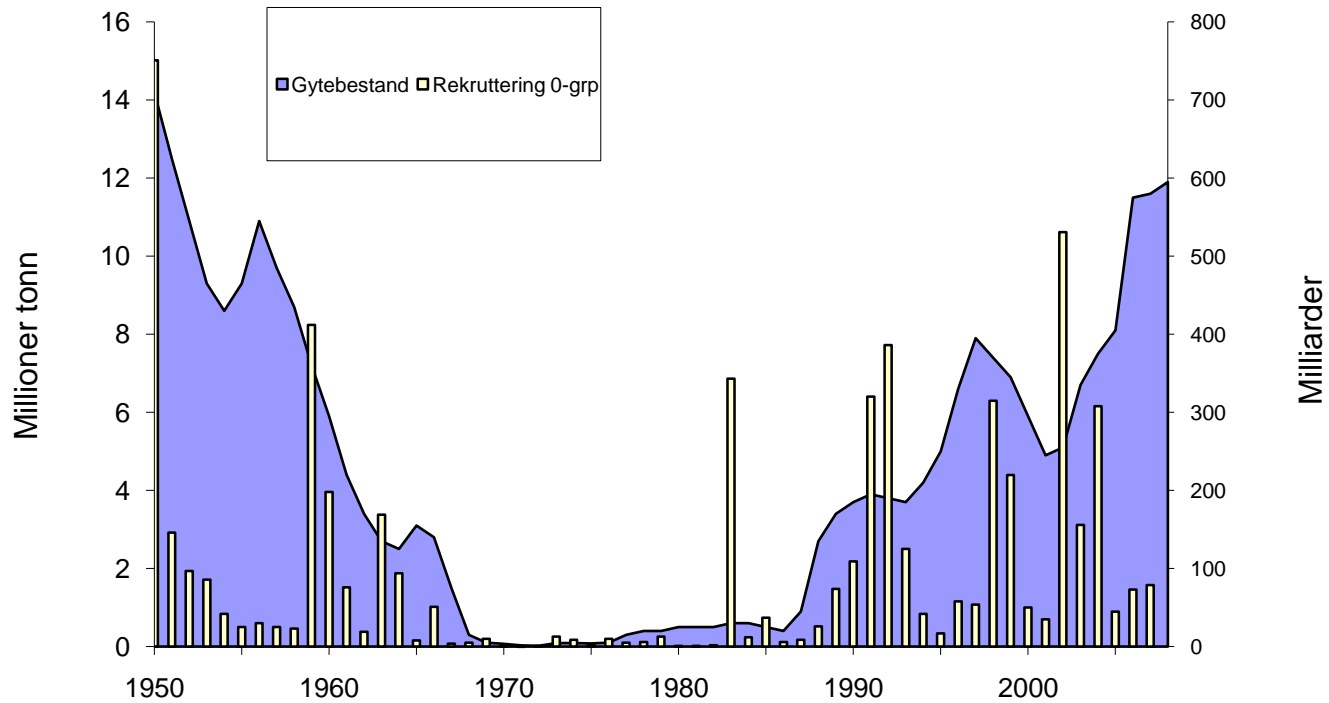


Figure 1 Spawning Stock Biomass of Norwegian Spring Spawning Herring during the period 1950-2008 (ICES, 2008).  $B_{lim}$  and  $B_{pa}$  reflects biological reference points utilised in the current Harvest Control Rule for the stock.

# Stock development



## **Conclusions**

- **Pelagic stocks can sustain profitable fisheries at very low levels**
- **Both fishery (HCR) and environment conditions determine rebuilding path**
- **Improvement both in exploitation pattern and exploitation rate determine rebuilding**
- **Limited fishery during the rebuilding period gave high payoff to small number of participants**
- **Importance of rebuilding the stock exceeds the scope of the herring fishery**