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# Northern Hake

WGHMM 2007

# Presentation will focus on



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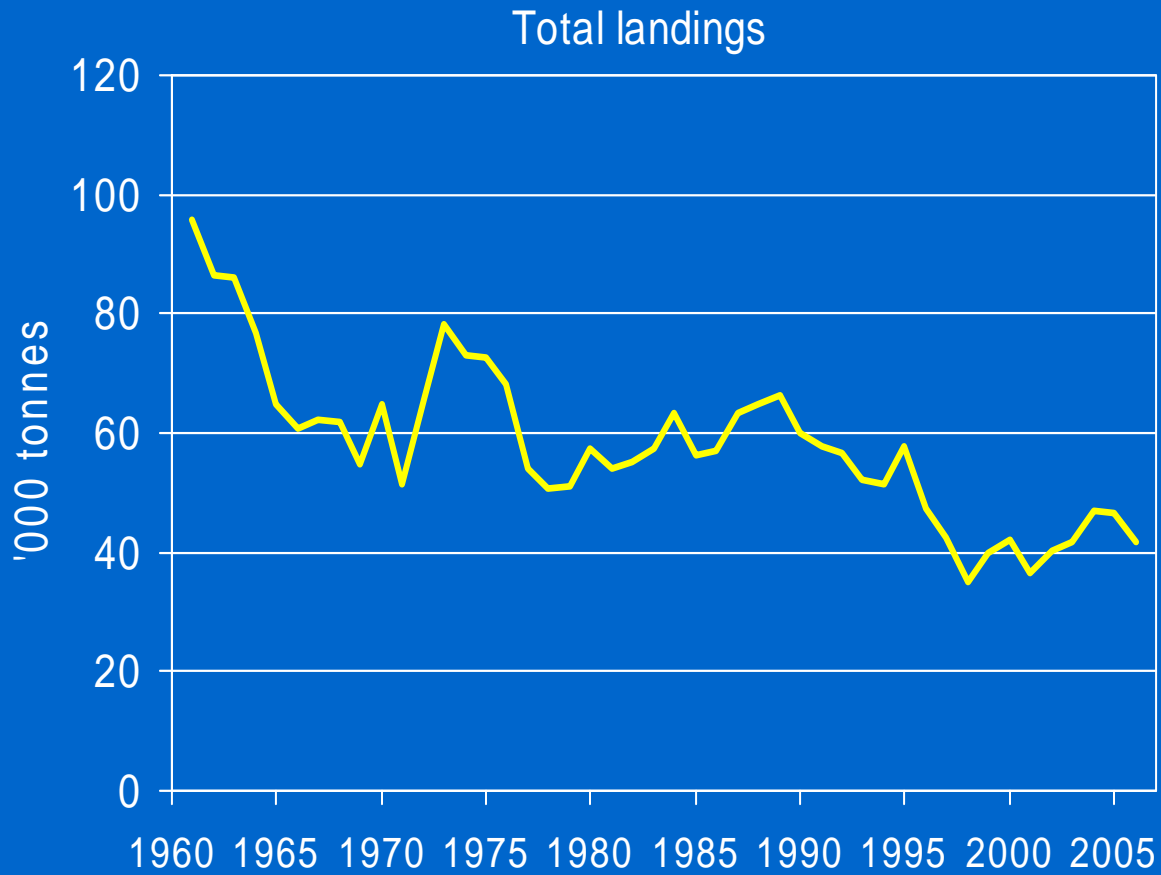
- Description of the fishery, data used for the assessment, uncertainties.
- Main results of the assessment from WGHMM and comments
- Management considerations.



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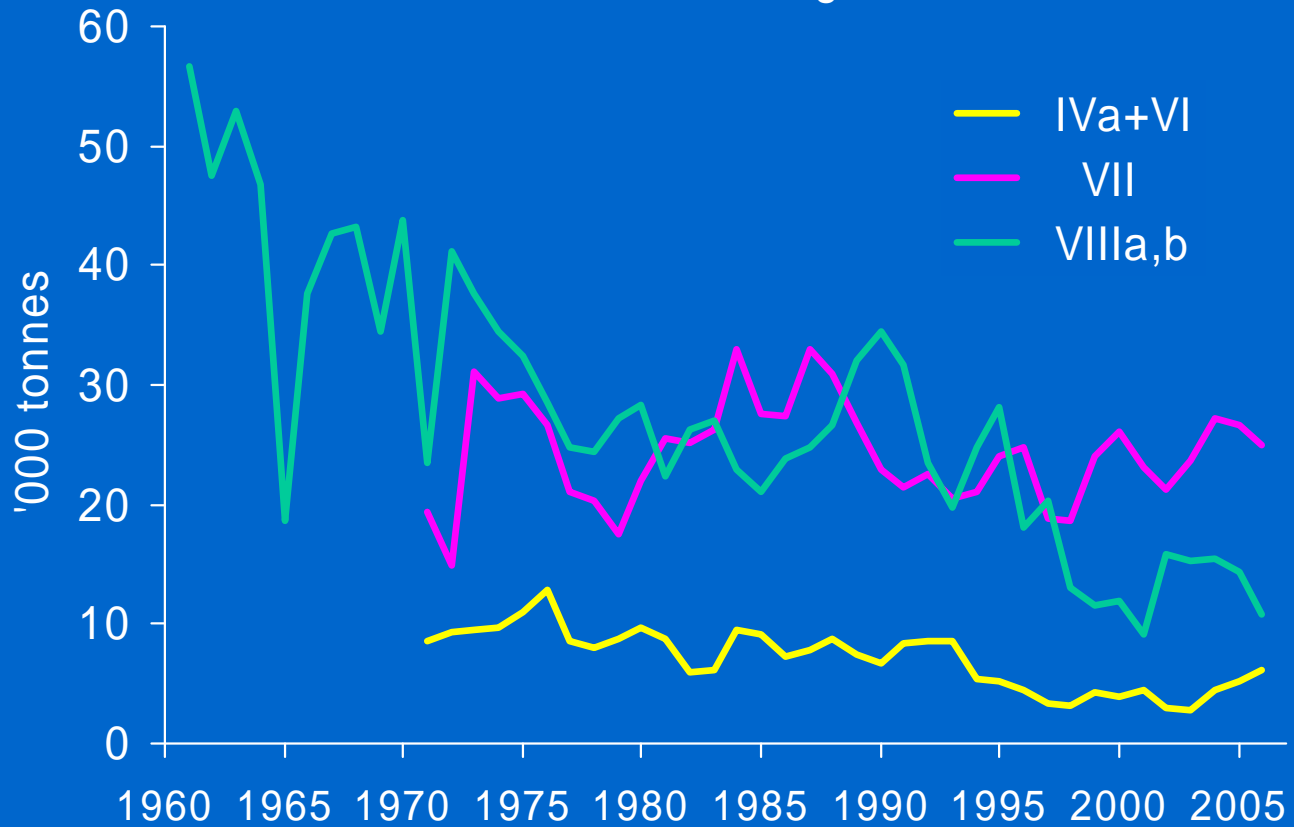
# Fishery - landings





# Fishery - landings

Total landings

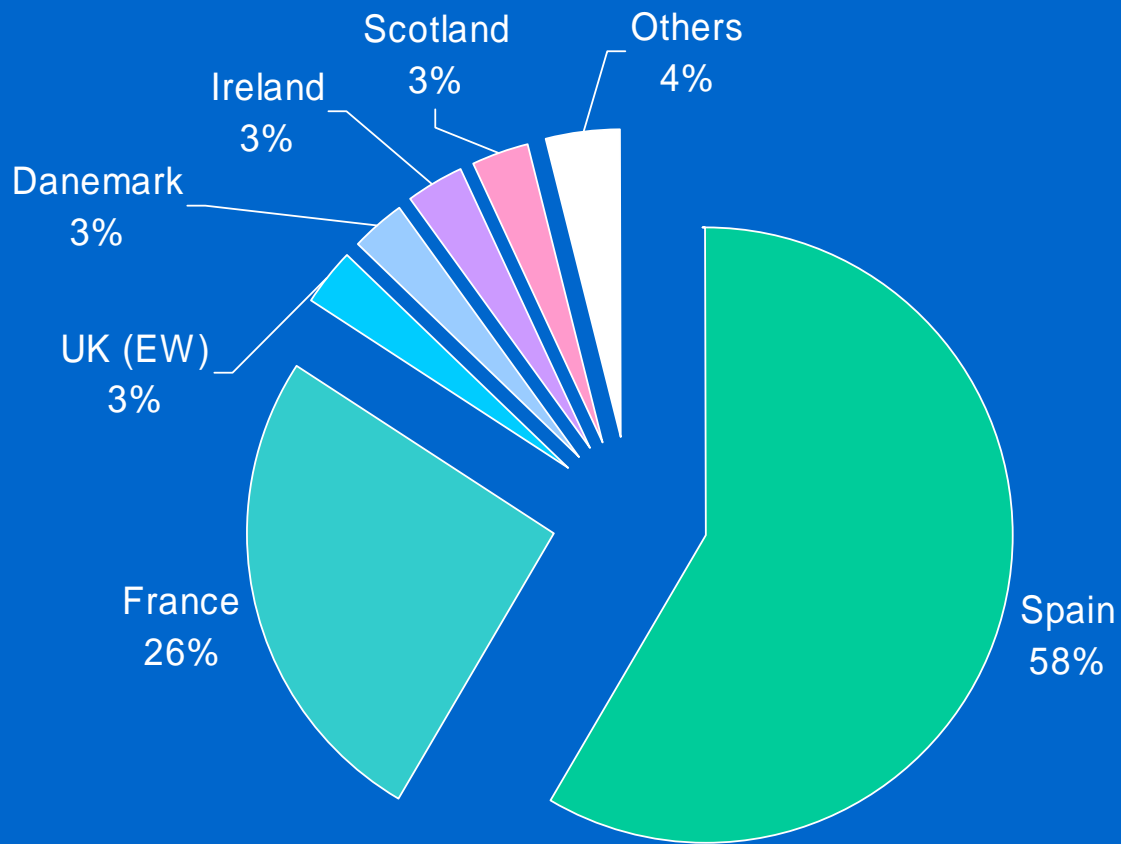


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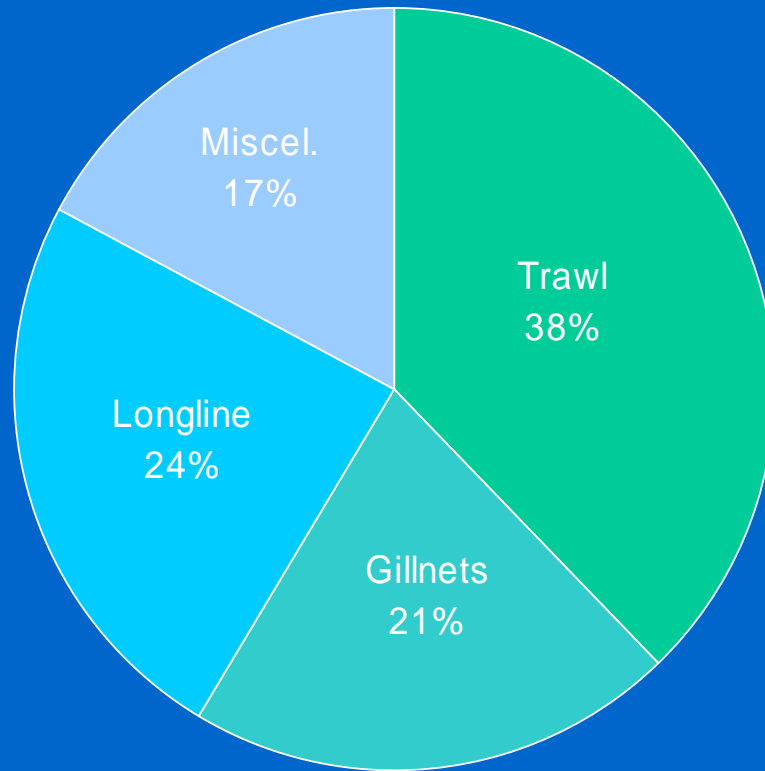


## Total landings - 2006





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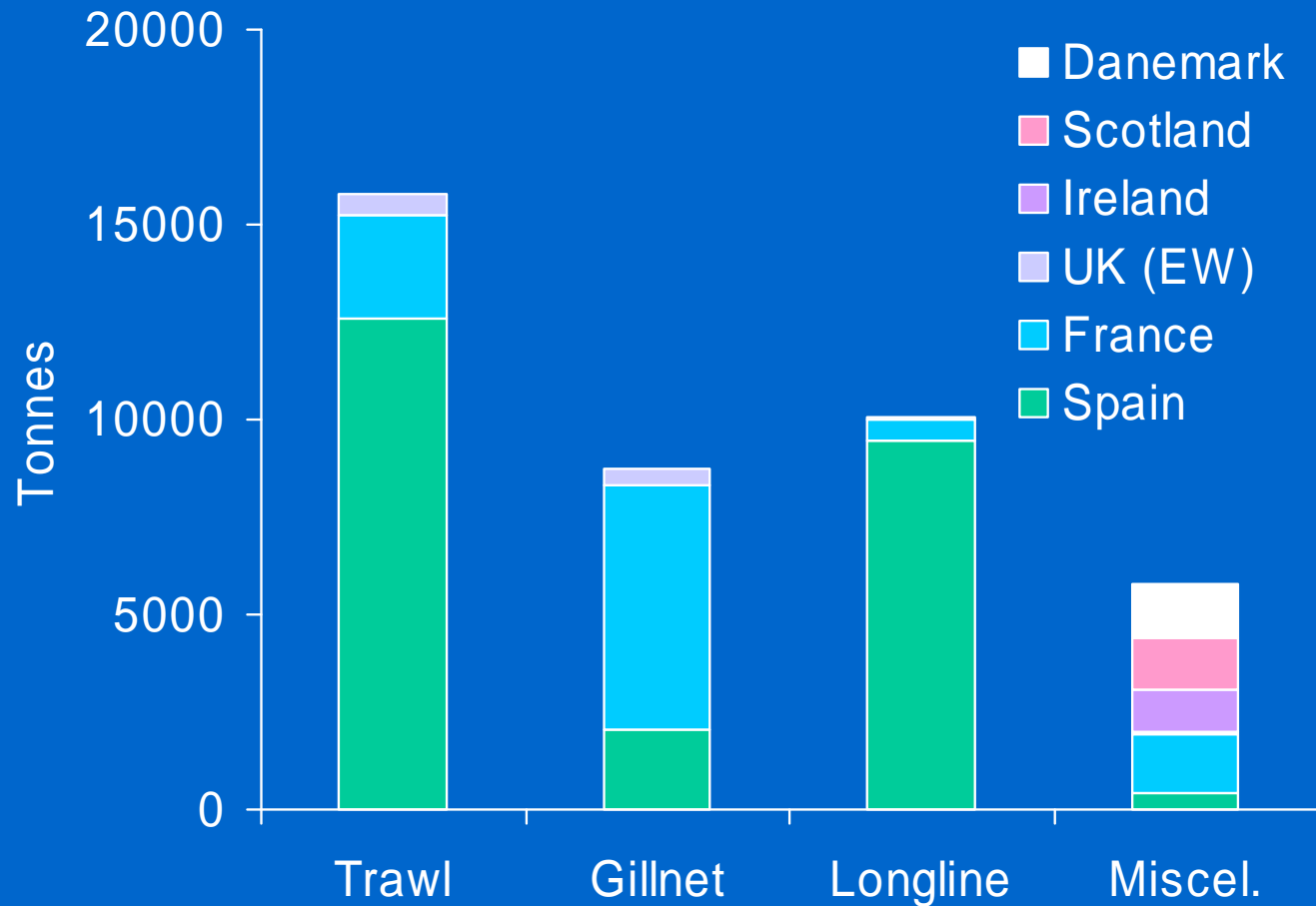


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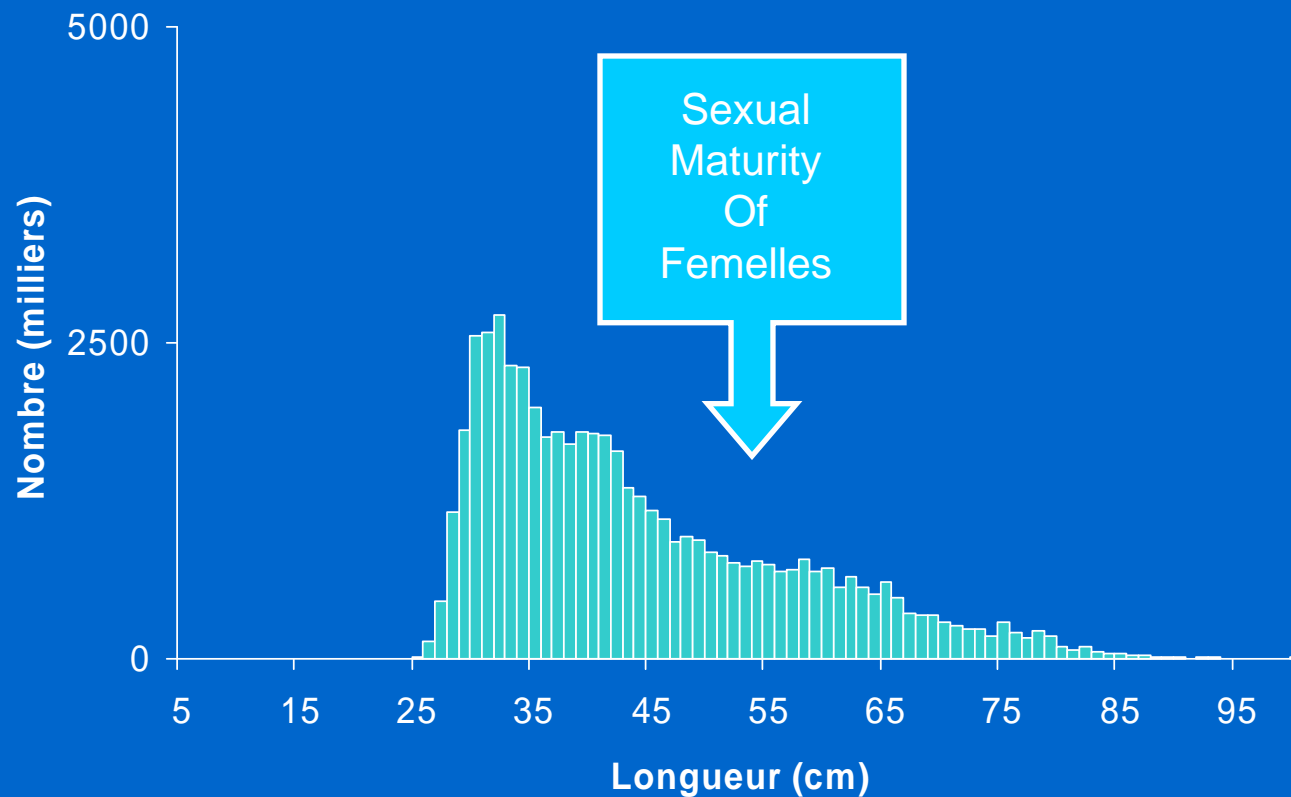


## Total landings - 2006





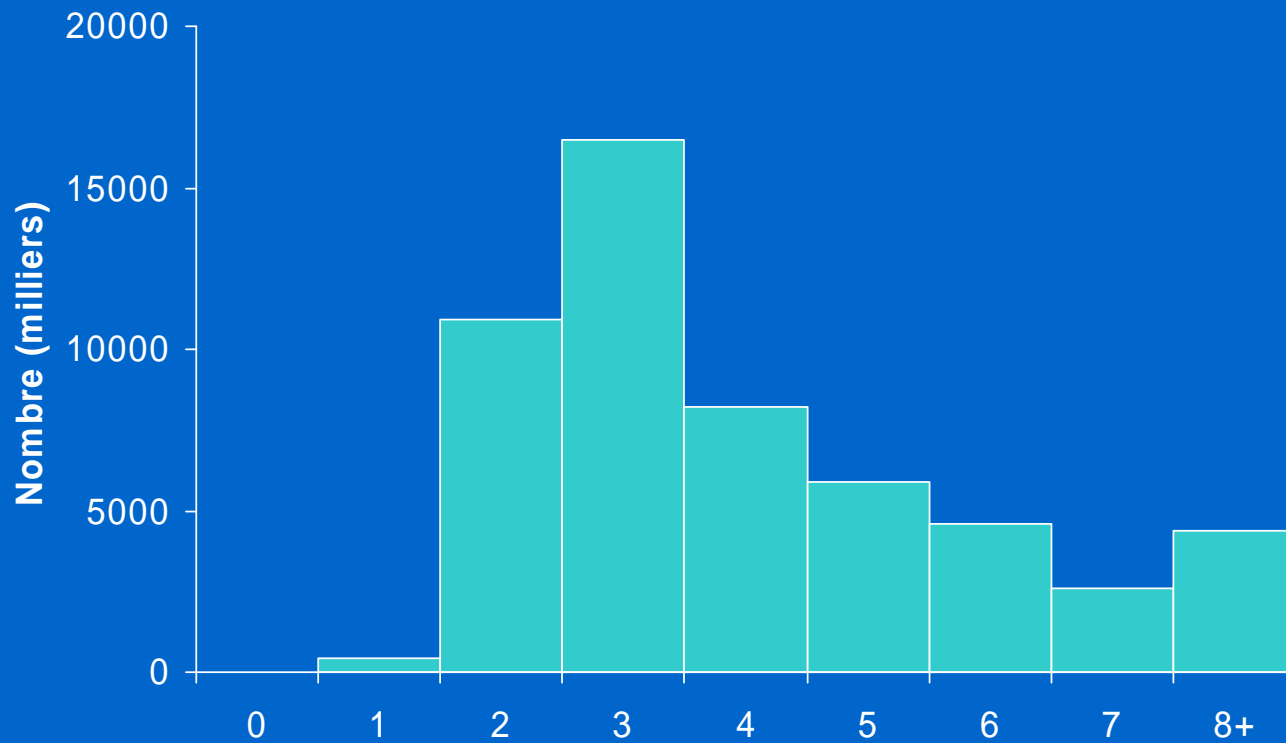
## Length distribution of the landings in 2006







## Age distribution of the landings - 2006



# Catch = landings+discards

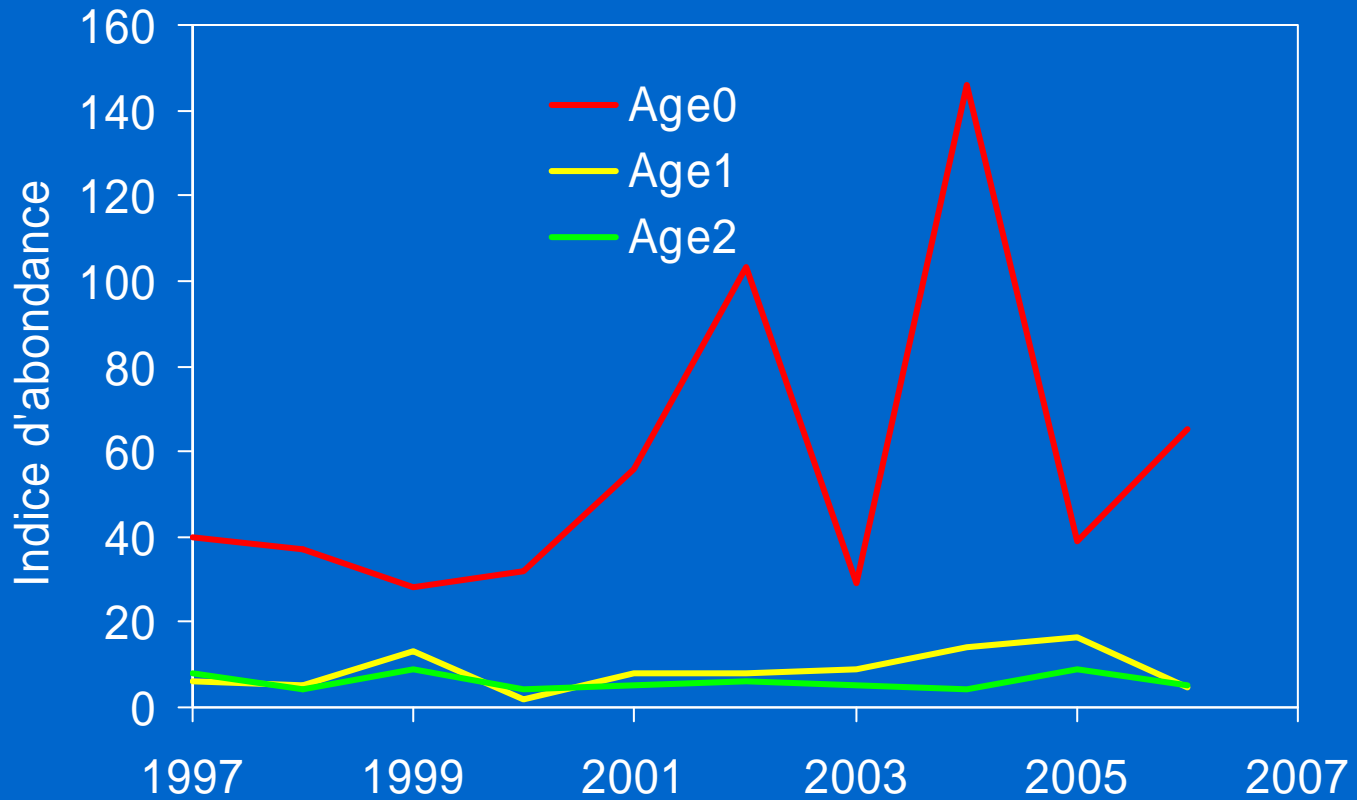
1. Sampling of discards does not cover all fleets (even if big progress with DCR since 2003)
2. When data are available, not possible to compile/aggregate in a consistent way.
3. Rebuild an historical series is problematic.

So as a consequence the group decided not to incorporate discards and remove age zero from the landing at age matrix





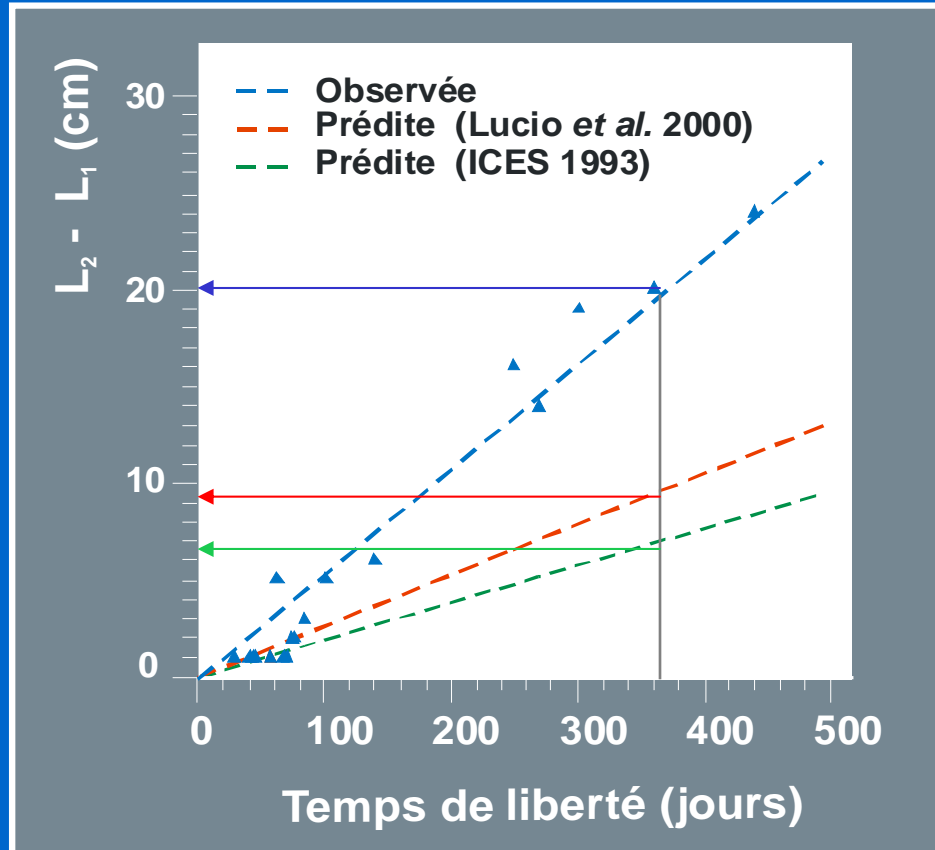
# Abundance indices: (Evhoe)



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# Uncertainty on Growth and ageing



# Stock assessment in WGHMM

Due to uncertainty on growth, since 2004, the WG carries out several assessments based on several assumptions



# Stock assessment in WGHMM



1. Assessment using ALK « observed » called « Update 2006 »
2. Assessment using a simulated ALK (based on a « faster » growth hypothesis close to what was observed from several tagging experiments conducted in the BoB.

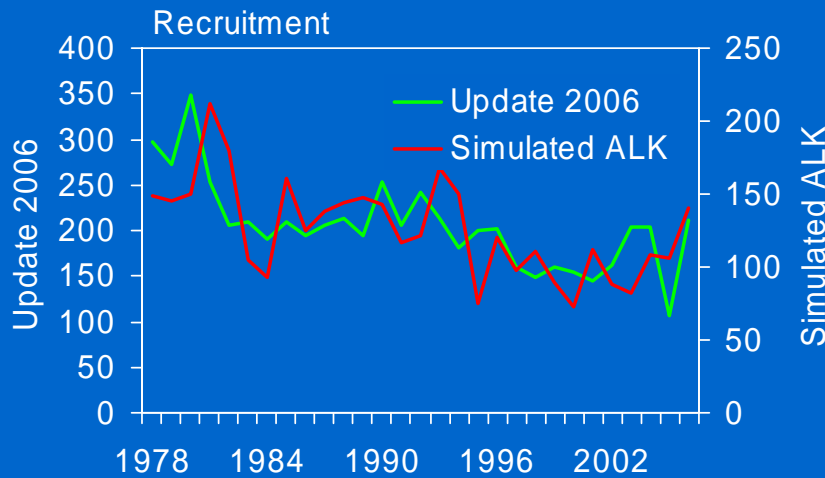
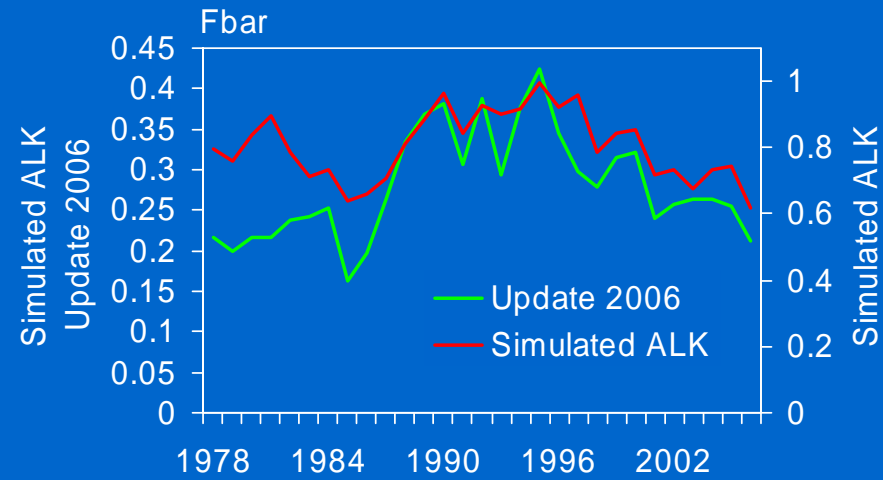
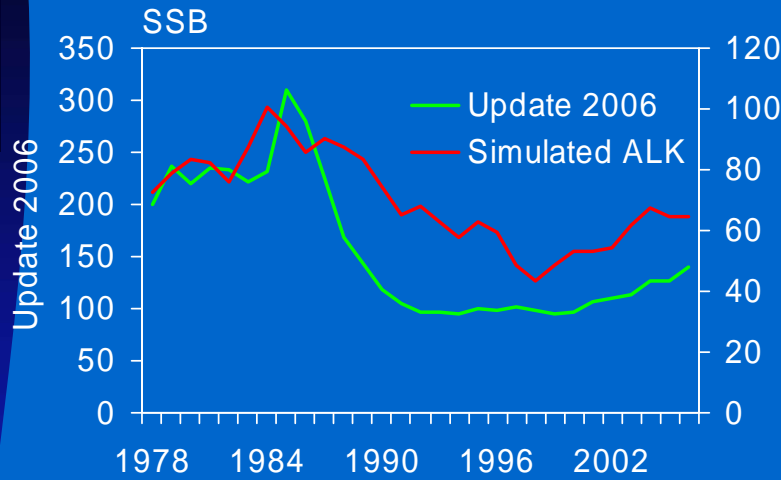
# Stock assessment in WGHMM



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## Main results

- Absolute values of Biomass and F very different
- Trends similar, particularly in recent years (SSB increases and F decreases).
- Decrease of SSB in the 90's faster with « current » growth hypothesis

# Stock assessment in WGHMM

## Main conclusions

Several sources of uncertainties :

- Non validated ageing criteria.
- Substantial uncertainty associated with total catches, particularly on small ages.
- Estimation of recruitment in recent years due mainly to inconsistencies in younger age indices from the FR-EVHOES survey.

Alternative runs conducted by the WG indicate that results are very sensitive to each of this uncertainties.





# Stock assessment in WGHMM

## Main conclusions



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- Despite these uncertainties, conclusions may be drawn:
  1.  $F$  decreases and  $SSB$  increase in recent years
  2. Some good recruitment in recent years

# Management considerations

Following concerns in the late 1990s about the low level of the stock biomass and the possibility of recruitment failure a range of technical measures were introduced :

- (Council Regulations N°1162/2001, 2602/2001 and 494/2002) aimed at improving the selection pattern and protecting juveniles: *100 mm minimum mesh size for otter-trawlers when hake comprises more than 20% of the total amount of marine organisms retained onboard, with a dispensation for those vessels less than 12 m in length and which return to port within 24 hours of their most recent departure. Further, two areas have been defined, one in Sub area VII and the other in Sub area VIII, where a 100 mm minimum mesh size is required for all otter-trawlers, irrespective of the proportion of hake caught*
- Subsequently a recovery plan was introduced (Council regulation EC Reg. No 811/2004). *The recovery plan consists of setting a TAC equivalent to a target  $F$  of 0.25 ( $F_{pa}$ ), or a lower  $F$  to prevent decline in SSB, and with the constraint that annual change in TAC should not exceed 15%.*



# Management considerations



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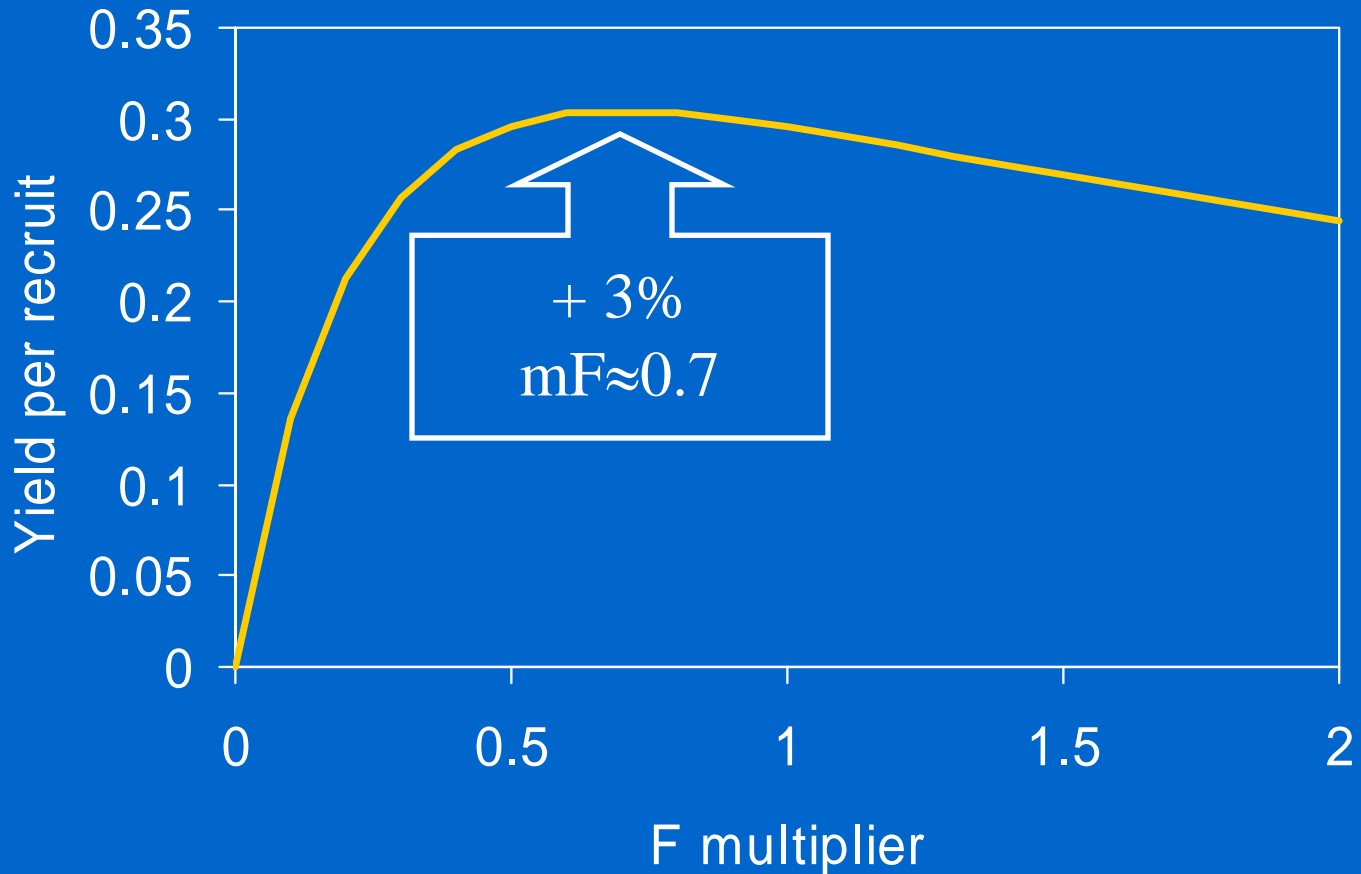
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Since WG2006, SSB has been estimated just above or very close to Bpa so according to the recovery plan, there may be an opportunity to move towards a **management plan (that's why we are here!)**.

This improvement in stock condition appears to be due to a combination of **good recruitment** and **moderate fishing mortality**.

# Management : long term considerations

Current assessment without discard included





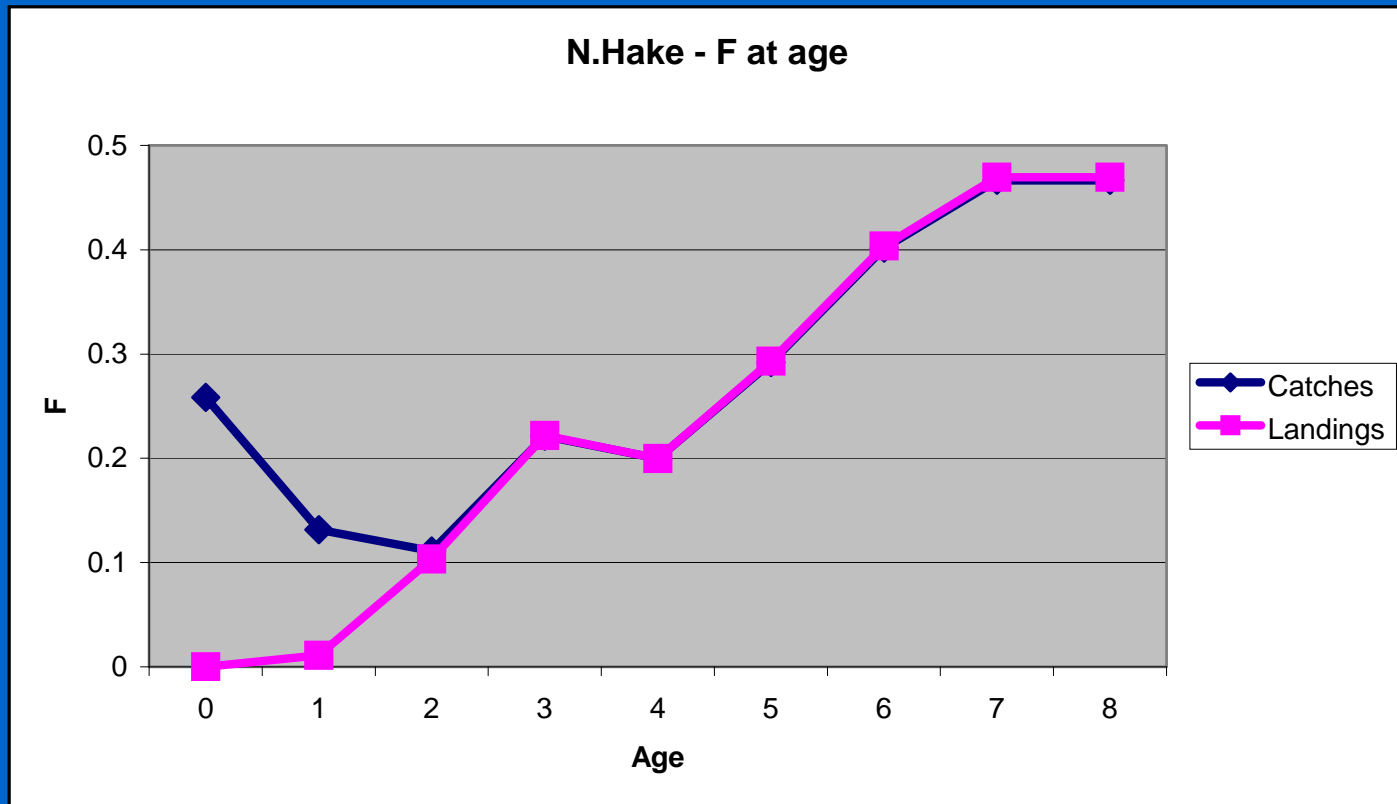
When discards not considered, on the long term, moving towards  $F_{max}$  may give a safer situation in term of biomass but not much gain in production to expect

**However**, not accounting for discards is not realistic when dealing with long term as we underestimate the fishing mortality on younger/smaller fish

So, with an ad-hoc reconstruction of the series of discards based on recent estimates obtained from DCR sampling we carried out a new assessment **with discards**



# F under-estimated on younger ages

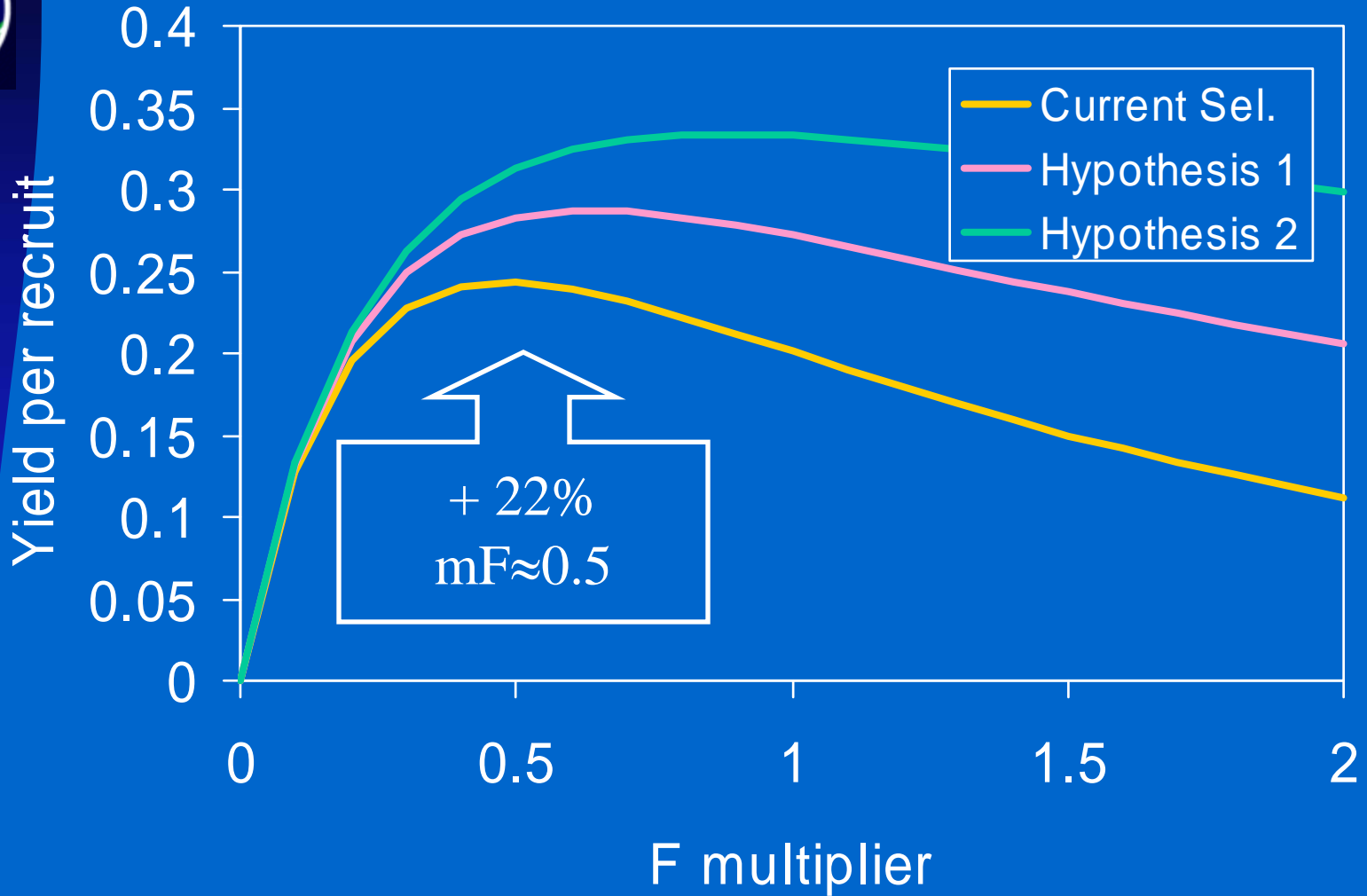


# Assessment with “discards” included



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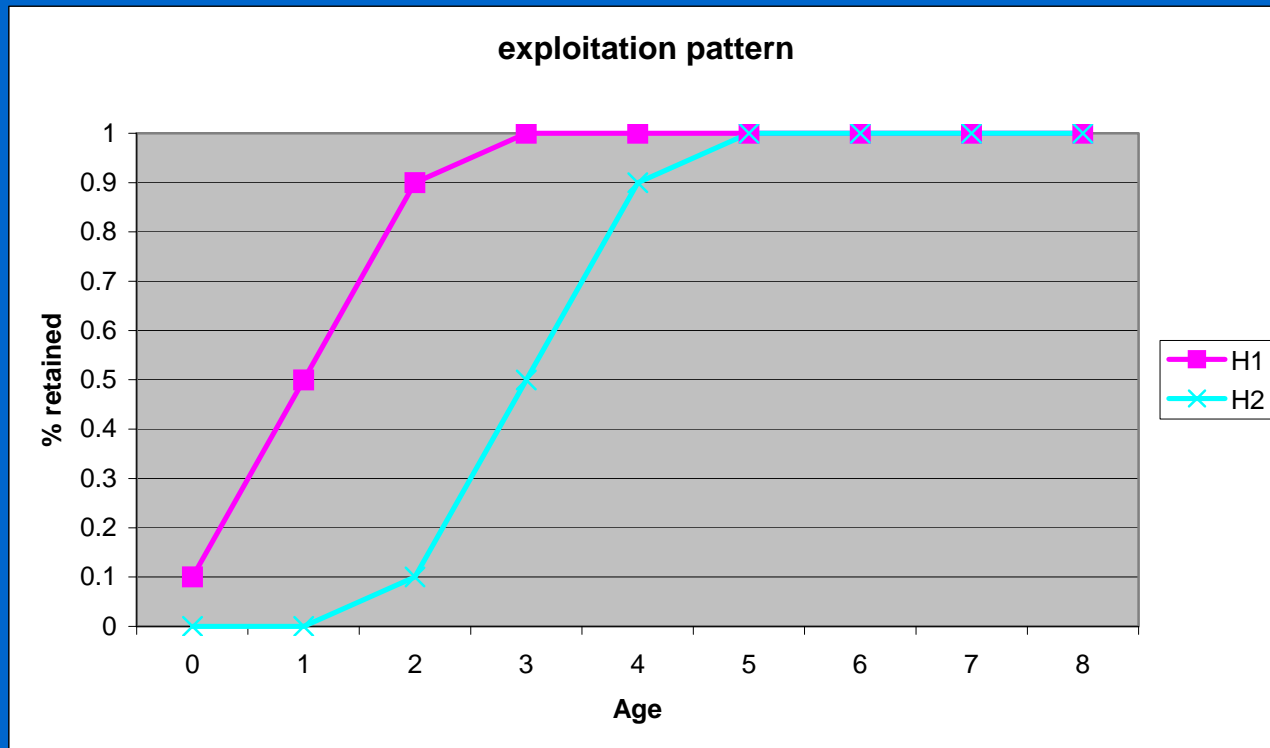


# Selection pattern improvement



H1: assumed than 90% of Hake at age 0 are spared, 50% at age 1 and 10% at age 2.

H2: assumed no catch at age 0 and 1, 10% at age 2, 50% at age 3 and 90% at age 4, compared to the current one







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