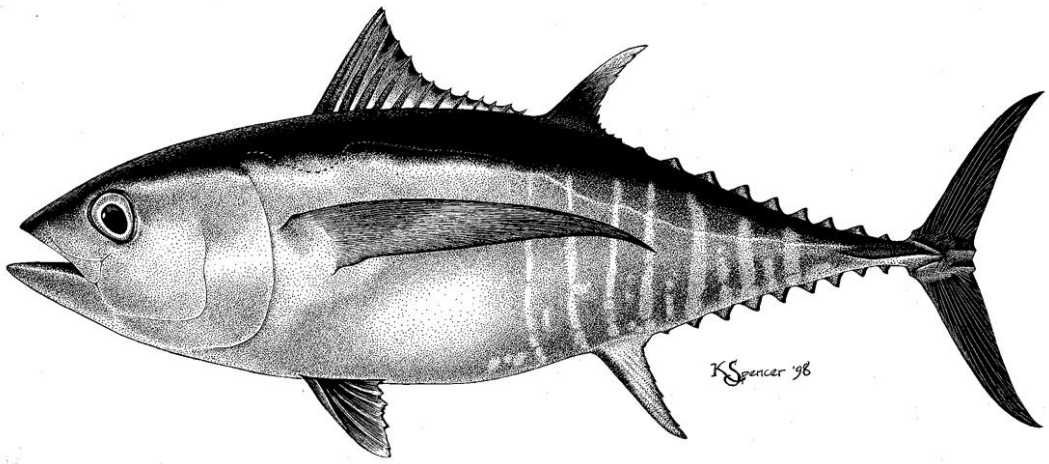
STATUS OF BIGEYE TUNA IN THE EASTERN PACIFIC OCEAN IN 2011

UPDATE OF 2010 STOCK ASSESSMENT

January 1975 – December 2011



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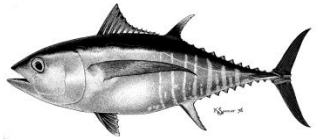
Outline



- Stock assessment (base case model)
  - Fishery data updates
  - Model assumptions
  - Results (fishing mortality, recruitment, biomasses)
  - Stock status (base case)
  - Population projections (*status quo* and F_{MSY})
- Stock-recruitment sensitivity analysis (steepness = 0.75)
- Summary conclusions

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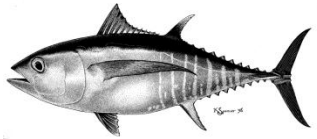
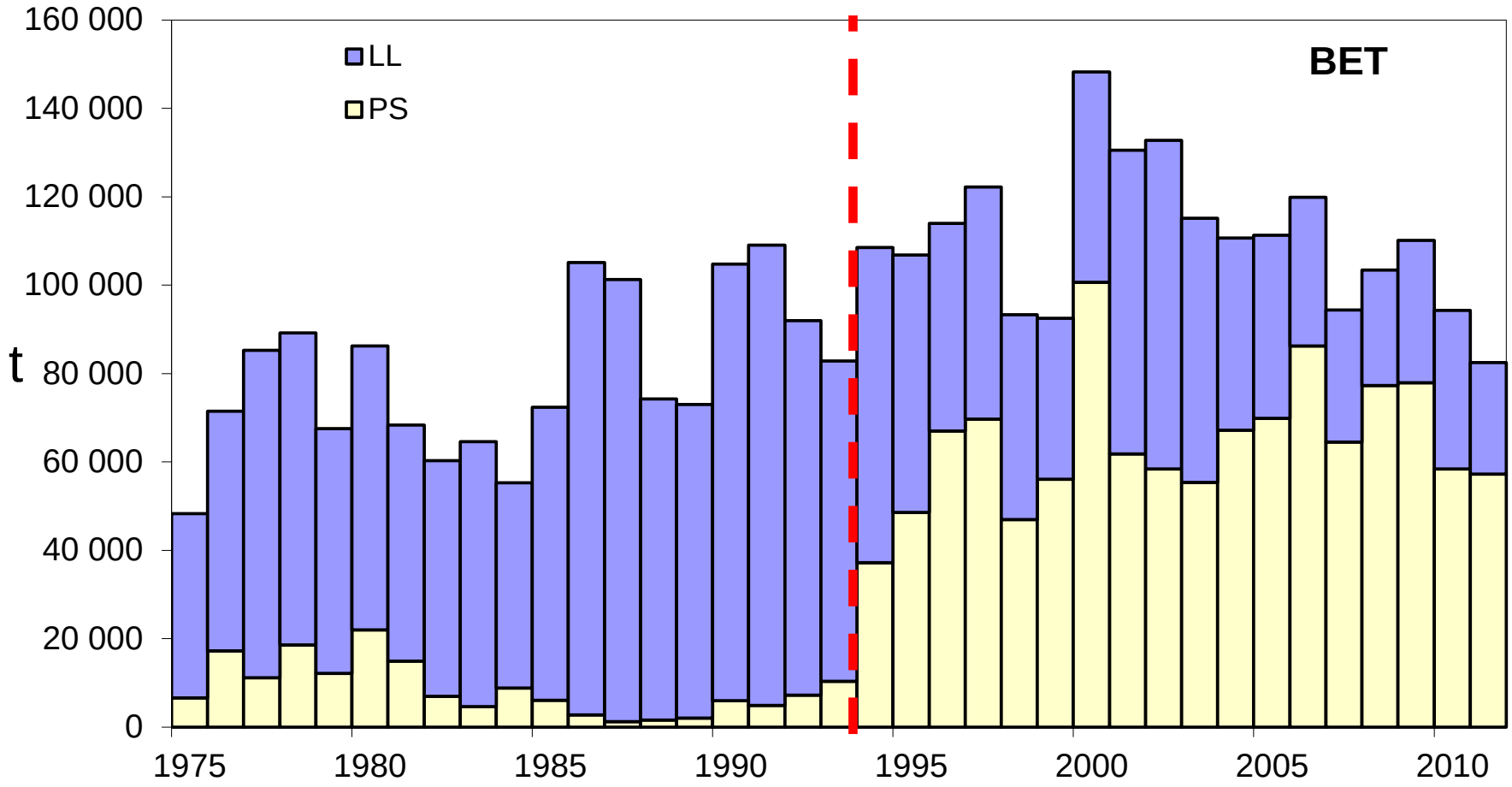
New or updated data



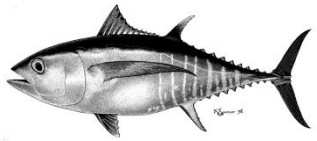
- Surface fisheries
  - Catch, CPUE and size-frequency data updated to include new data for 2011 and revised data for earlier years
- Longline fisheries
  - New or updated longline catch data: China (2010), Chinese Taipei (2008-2010), French Polynesia (2010), Japan (2007-2010), Republic of Korea (2009-2011) and US (2009-2010)
  - 2011 longline catch data available from monthly reports: China, Chinese Taipei and Japan
  - New or updated CPUE data available for Japan (2007-2010)
  - No new or updated longline size-frequency for Japan (data from 2011 submission used, 2007-2009)

Total catches

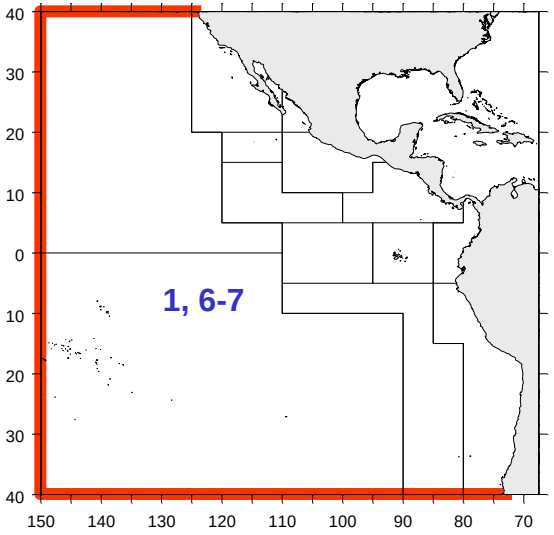


Expansion of FAD fishery

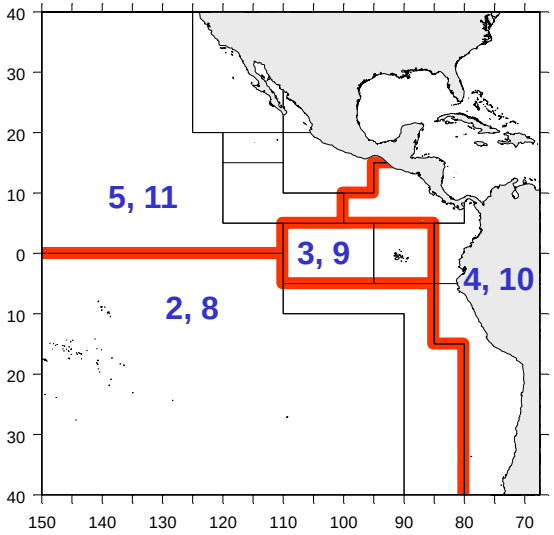
BET fishery definitions



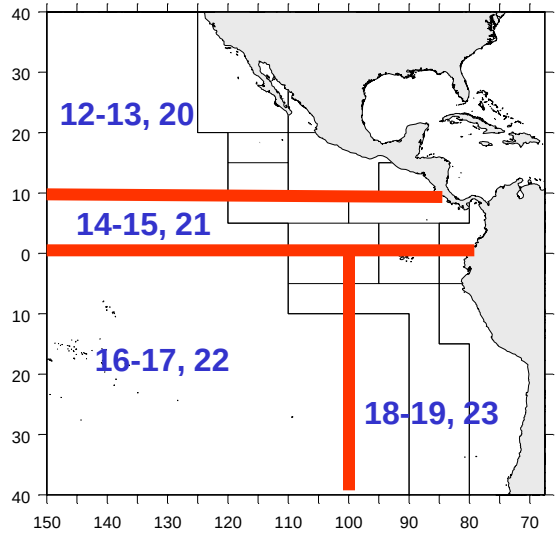
Early OBJ (1)
Early & Late DEL&NOA (6, 7)



Recent OBJ (2-5)
Discards (8-11)



Early/Late LL N (12-13, 20)
Early/Late LL C (14-15, 21)
Early/Late LL S (16-17, 22)
Early/Late LL I (18-19, 23)



GEAR TYPE: PS, LP, LL

PS set type (OBJ, NOA and DOL)

Time period

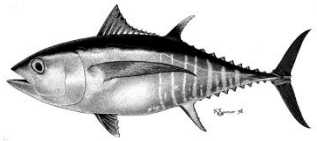
The IATTC sampling areas

DEL – sets on dolphins

NOA – sets on unassociated fish

OBJ – sets on floating objects

LL – longline sets

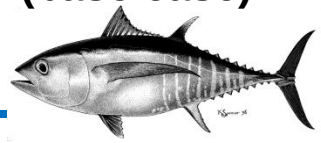


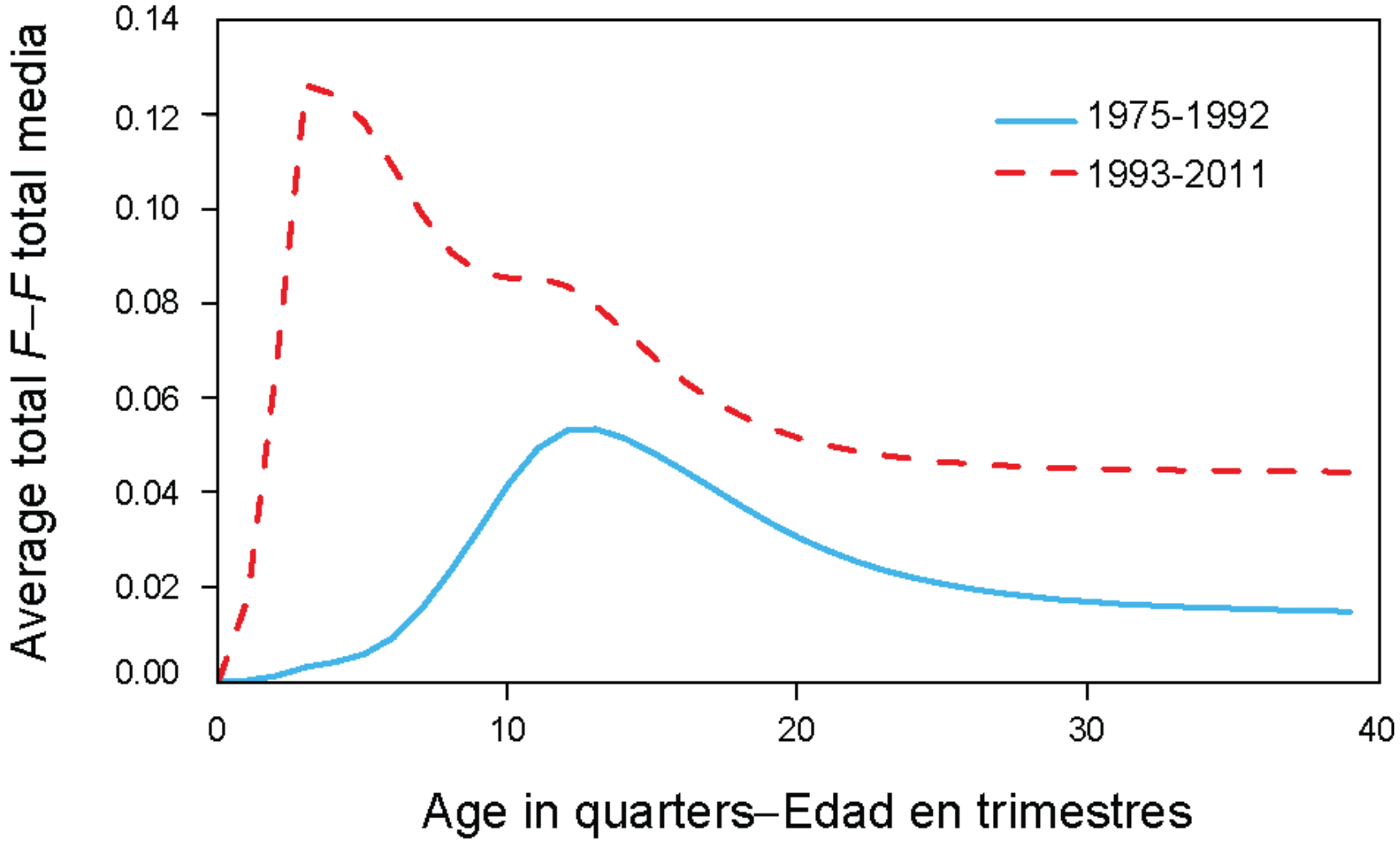
Model assumptions

- Same model as in SAC2 (improved after External Review in May 2010)
- Fishery definitions: 23 fisheries
- Data weighting: the CV of the southern LL fishery was fixed (0.15), others estimated
- Growth modeling: Richards curve, L2 fixed, variance of length-at-age estimated
- Modeling of catchability and selectivity:
  - Two time blocks for all LL fisheries (split at 1990)
  - Early dome, late asymptotic selectivities

Age-specific fishing mortality

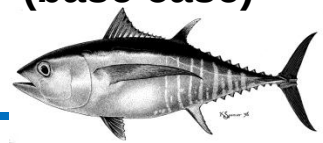
Results
(base case)

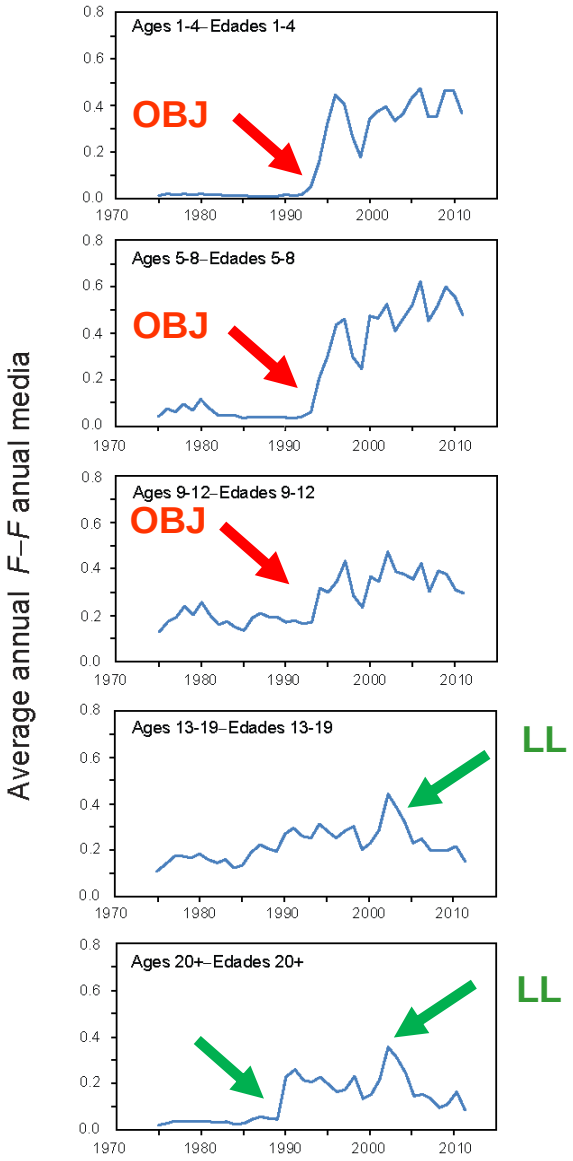




Fishing mortality

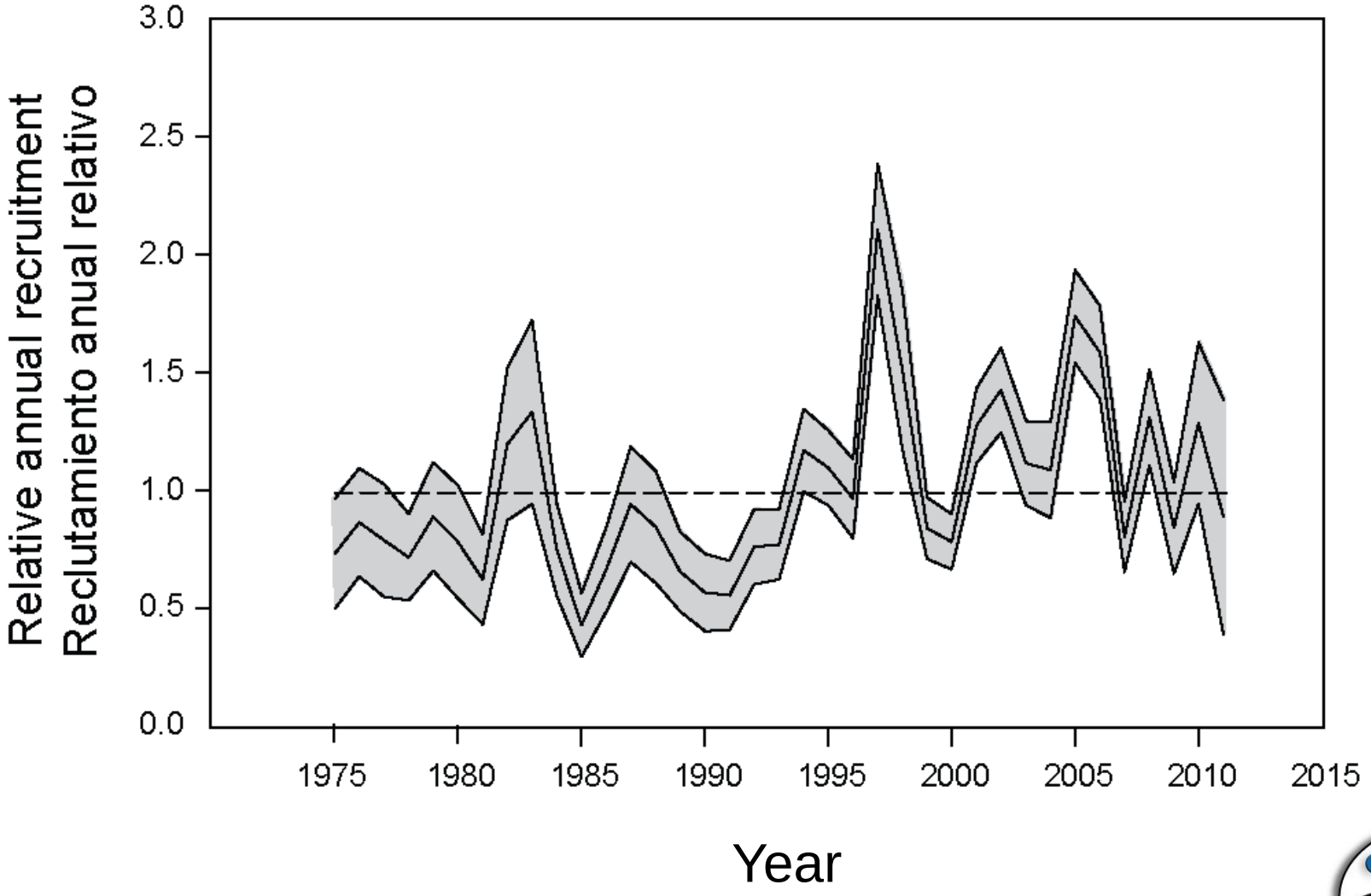
Results (base case)





Recruitment

Results
(base case)



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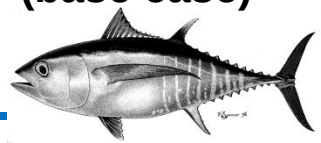
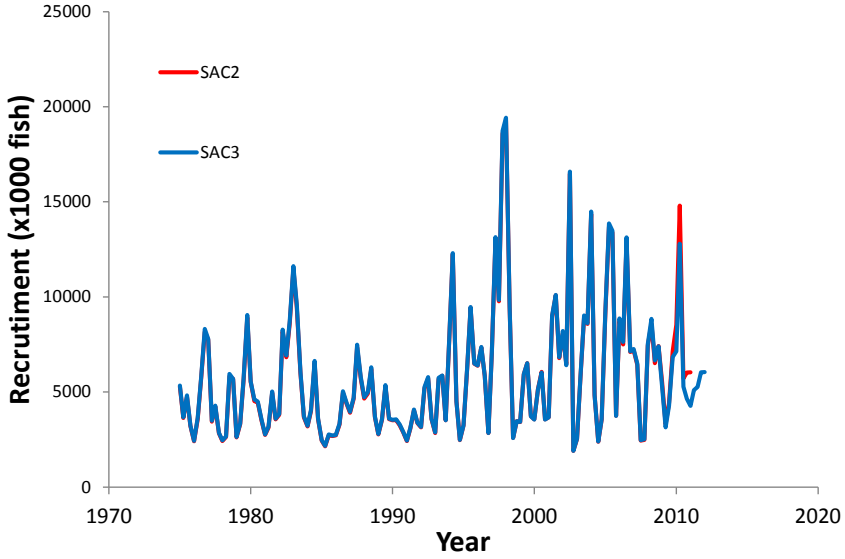
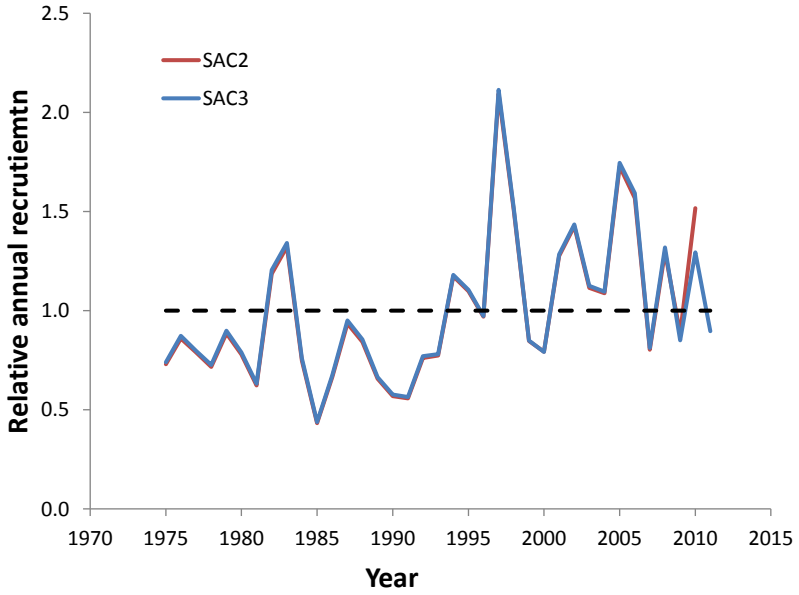
Recruitment

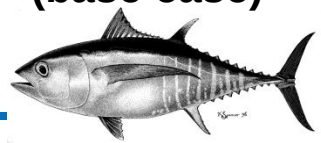
Results (base case)

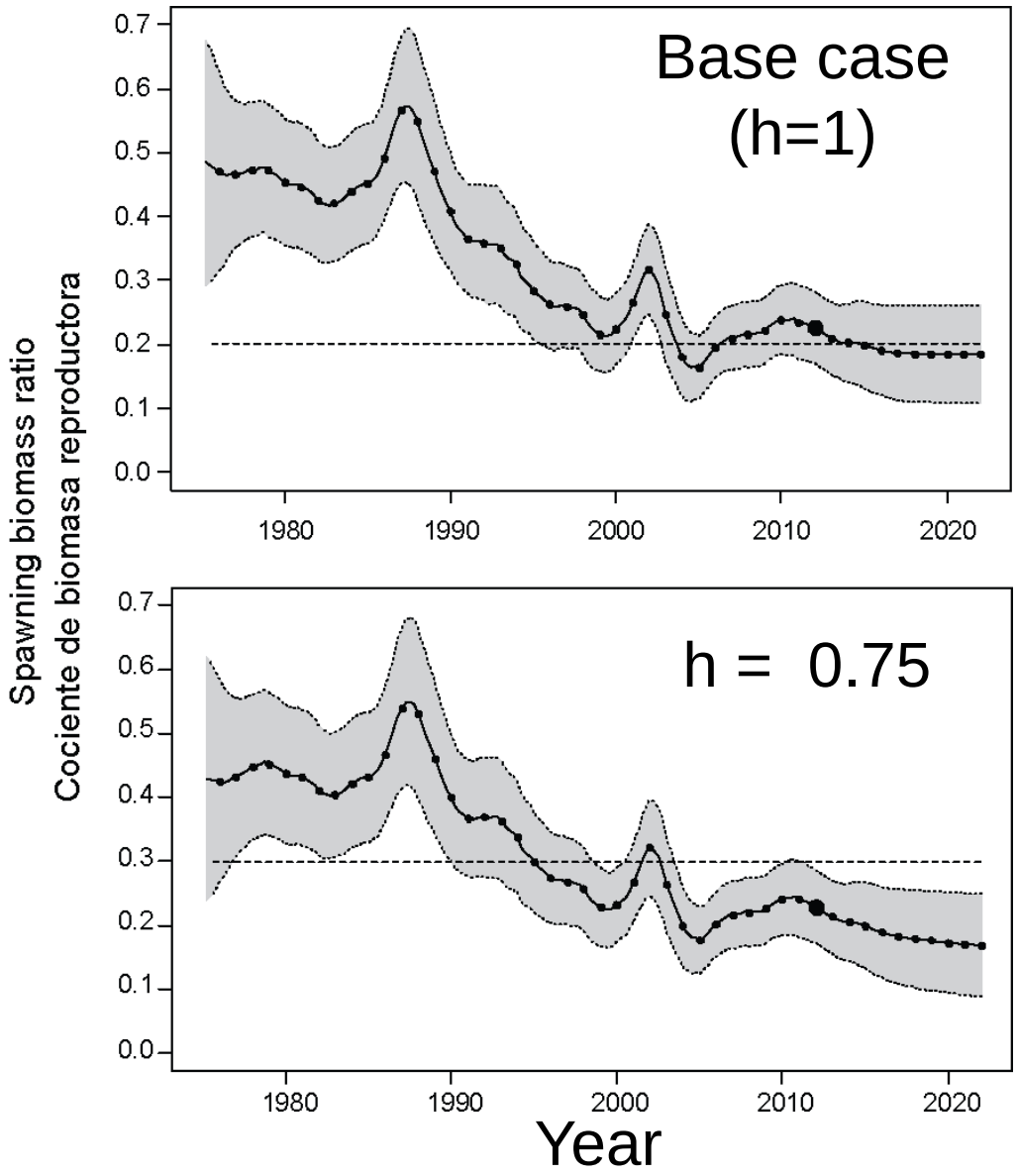






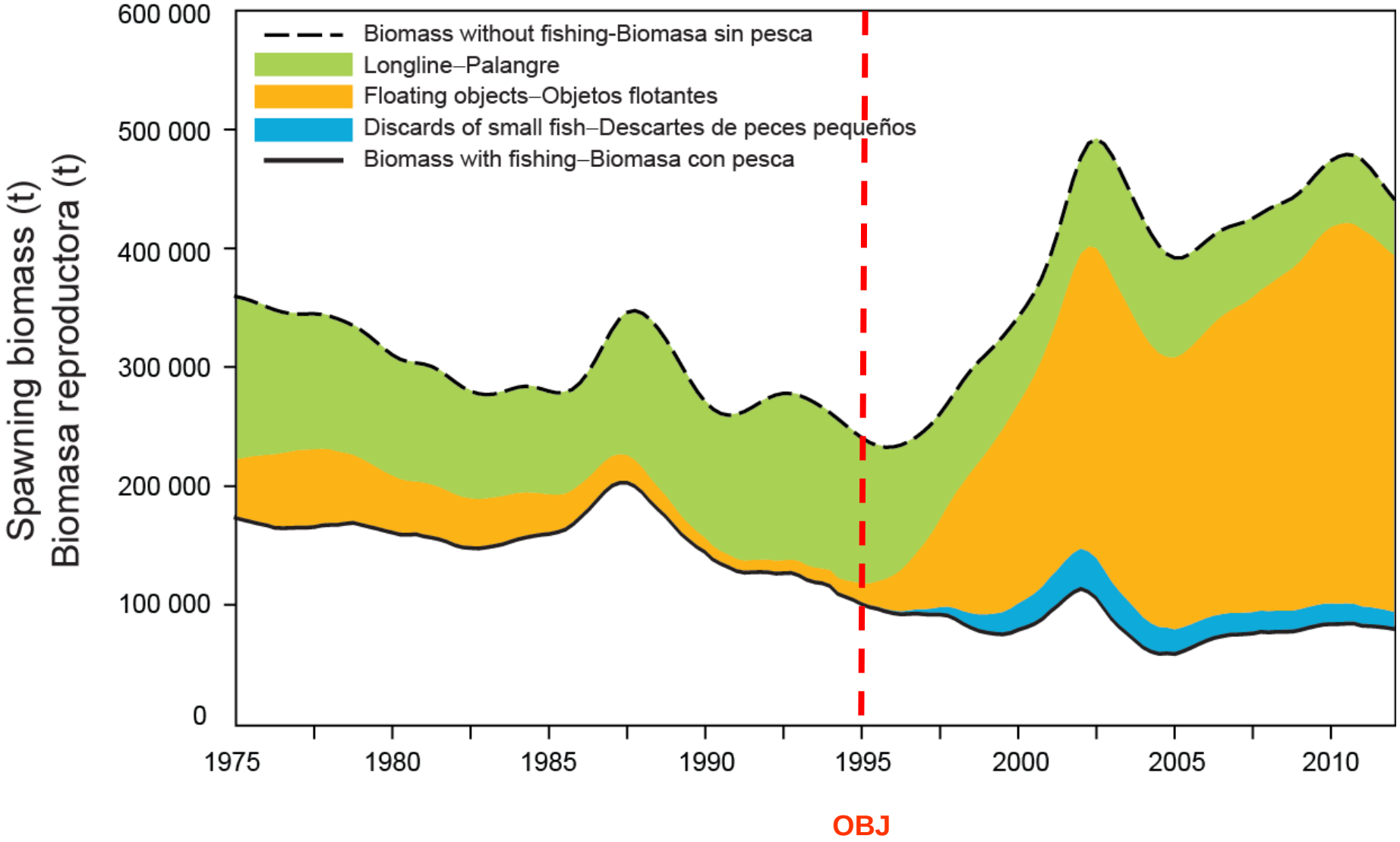
Spawning Biomass Ratio (SBR)





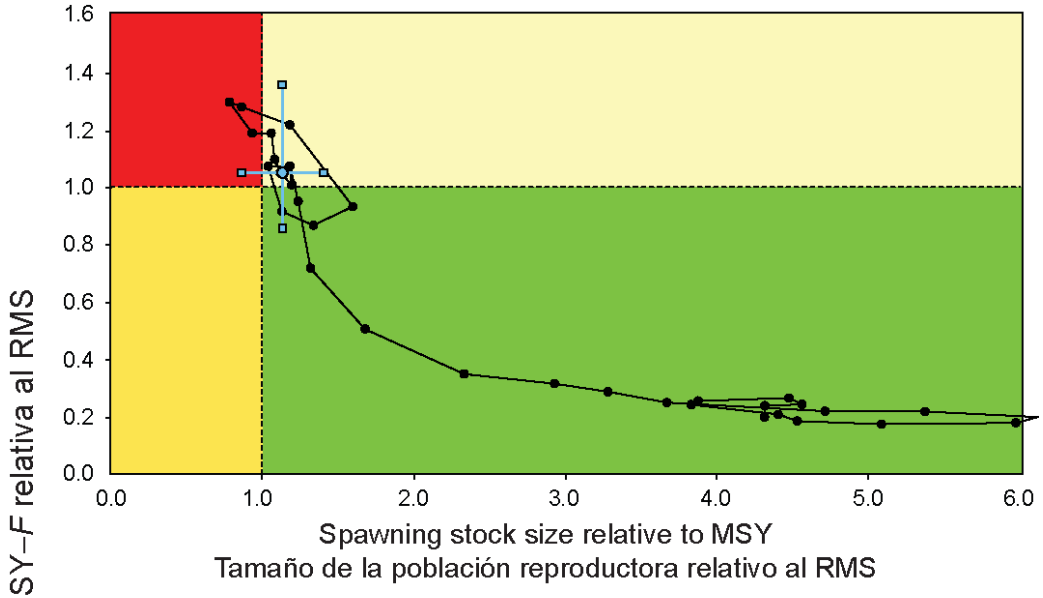
Fishery impact

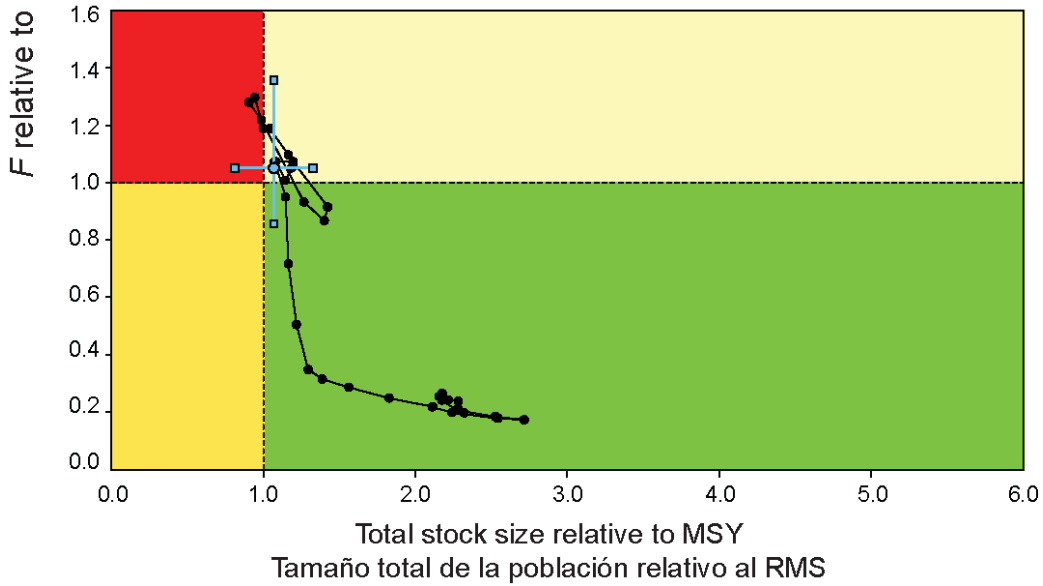
Results
(base case)



Kobe plot

Stock status (base case)





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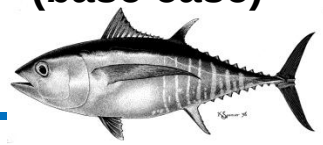
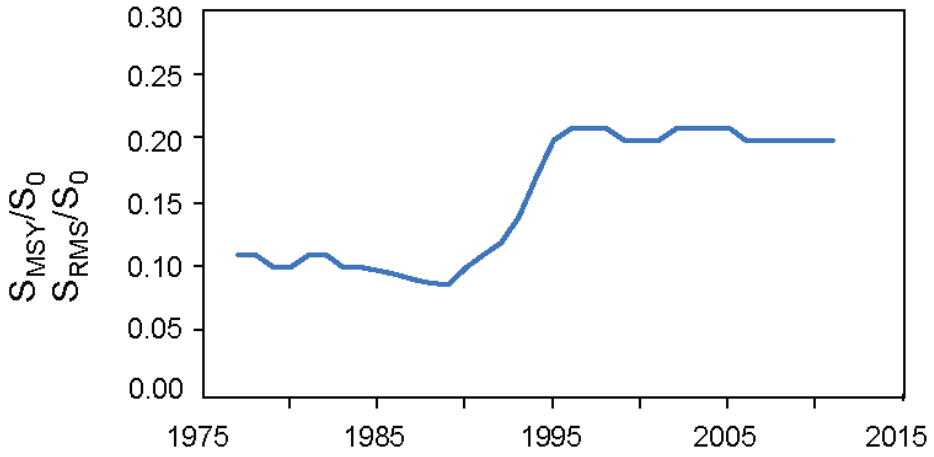
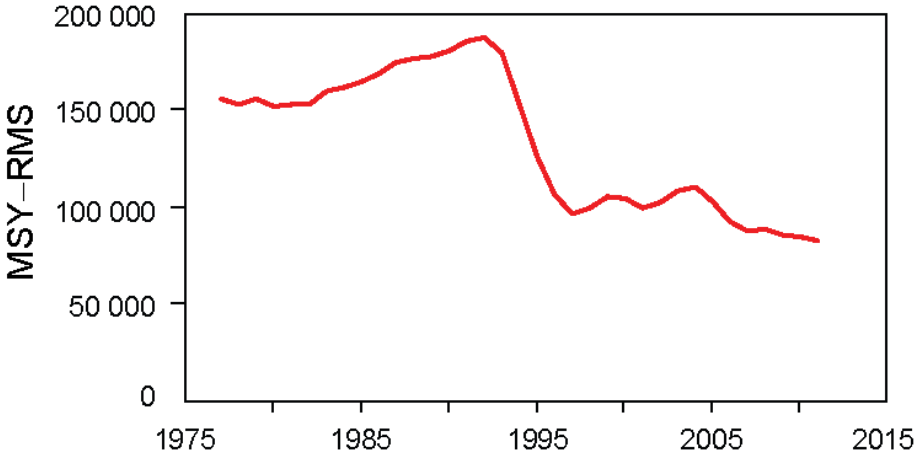
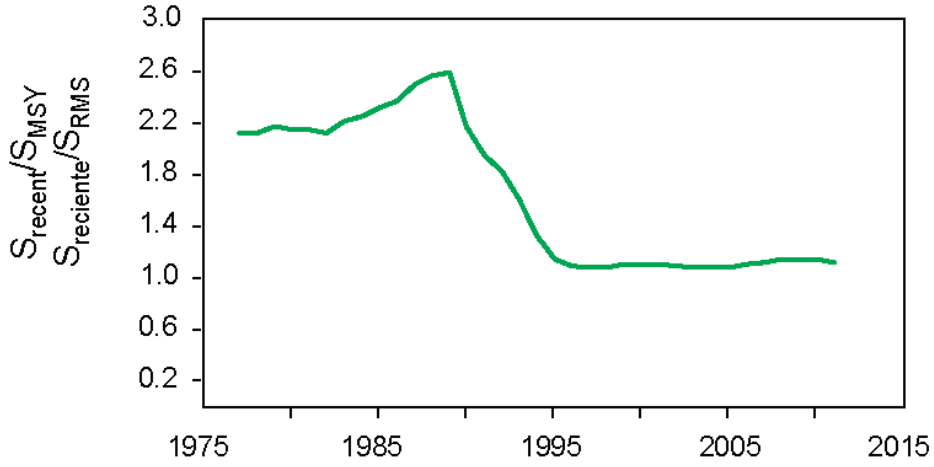
Time varying indicators

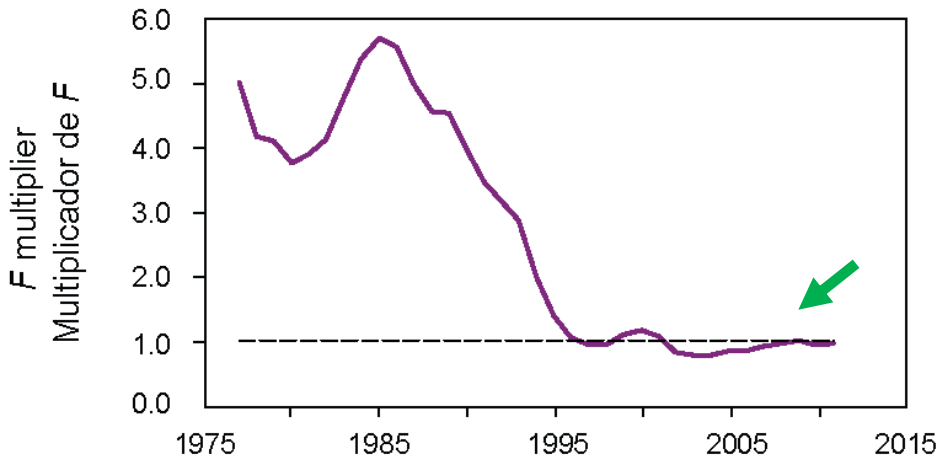
Stock status (base case)



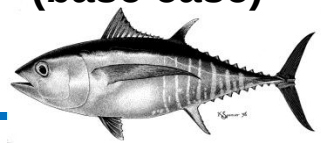






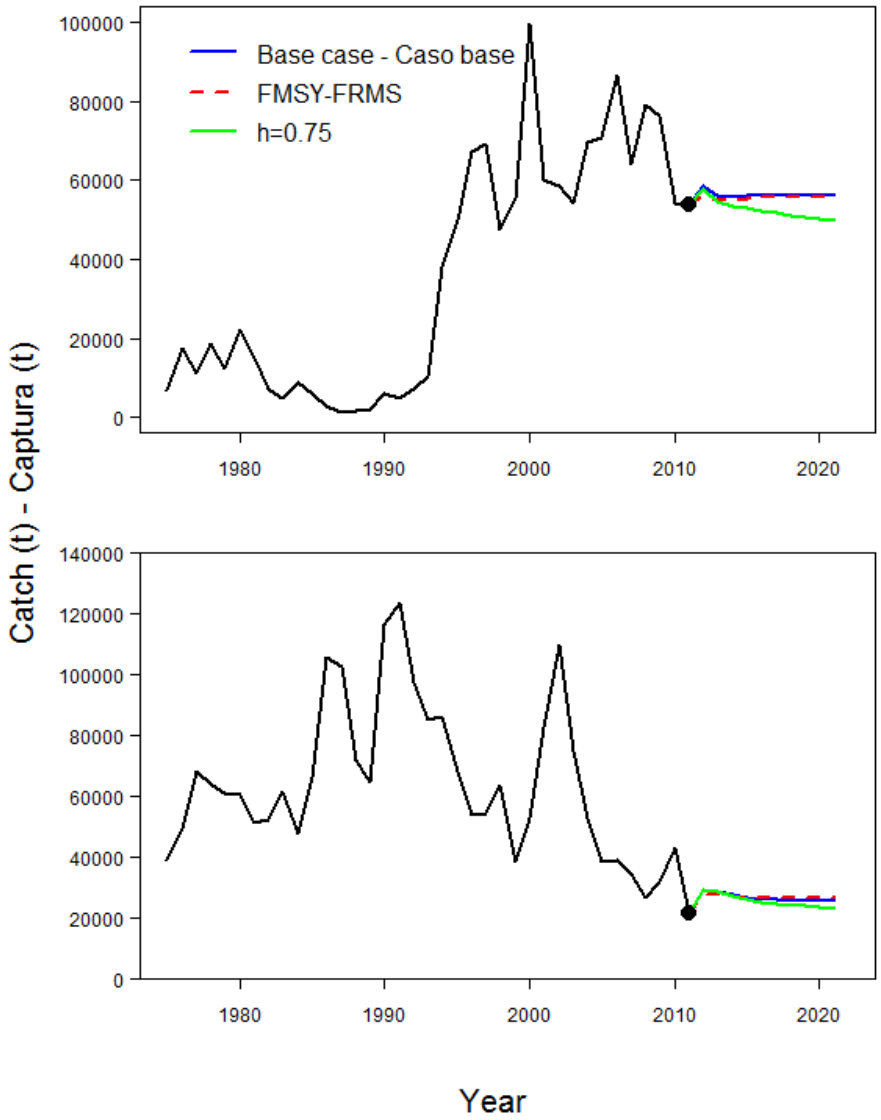


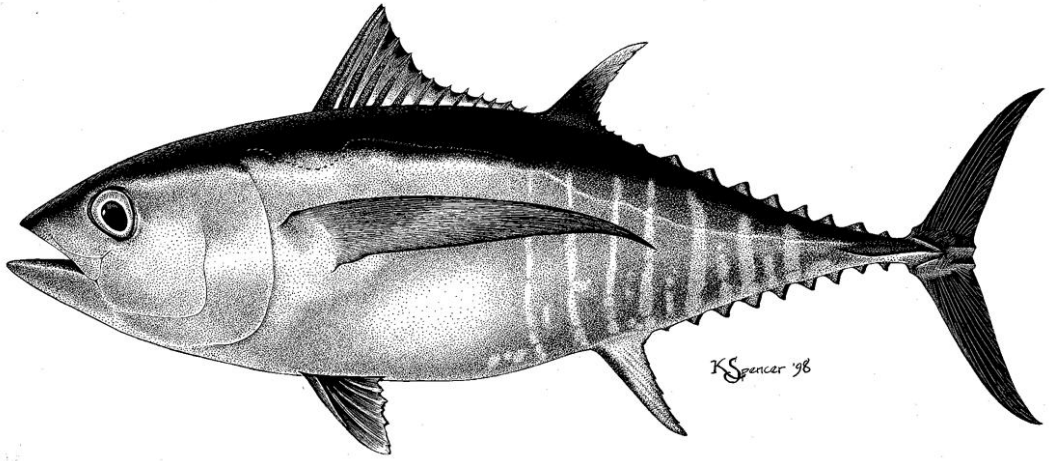
Management quantities



	Base case – Caso base	h = 0.75
MSY–RMS	82,246	78,879
B_{MSY} –B_{RMS}	320,818	559,384
S_{MSY} —S_{RMS}	72,902	140,995
C_{recent}/MSY—$C_{reciente}$/RMS	0.92	0.96
B_{recent}/B_{MSY} –$B_{reciente}/B_{RMS}$	1.06	0.76
S_{recent}/S_{MSY} –$S_{reciente}/S_{RMS}$	1.12	0.77
$B_{MSY}/B_{F=0}$ –$B_{RMS}/B_{F=0}$	0.25	0.34
$S_{MSY}/S_{F=0}$ –$S_{RMS}/S_{F=0}$	0.20	0.30
F multiplier—Multiplicador de F	0.95	0.70

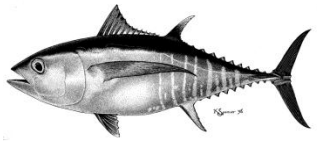
Projected catches – *Status quo* (F_{cur})



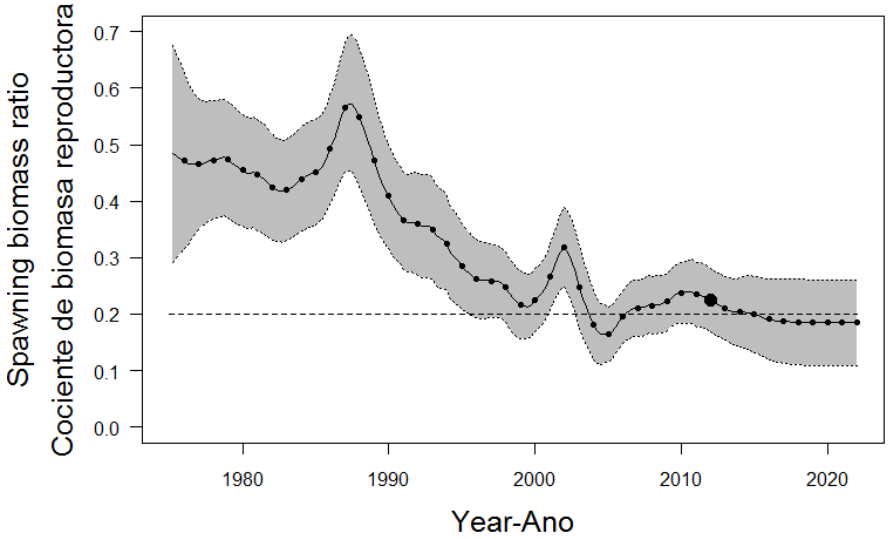


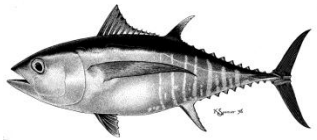
Summary

Summary: key results



- Current biomass level is low compared to average unexploited conditions
- There are signs of a recent recovery trend (2005-2010) from a historic low in 2004
- But, recent recruitments are predicted not to sustain the rebuilding trend





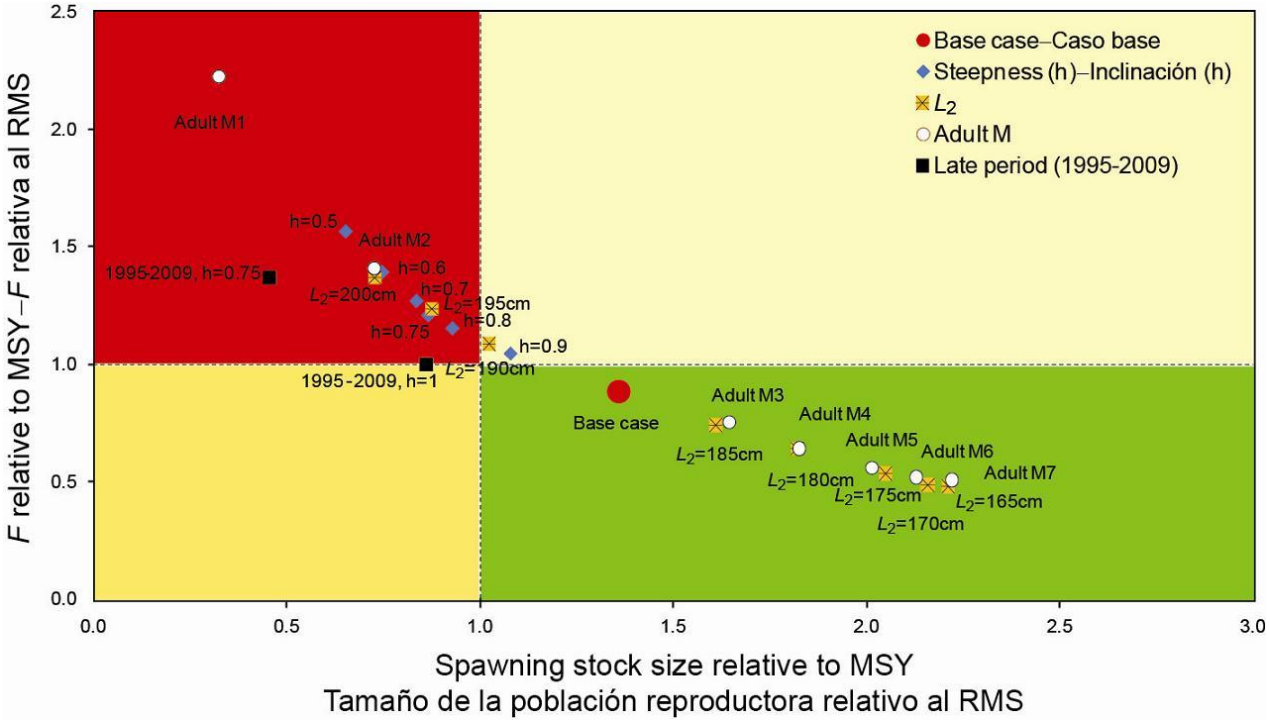
Summary: key results (cont.)

- The recent **fishing mortality** rates are estimated to be slightly above the level corresponding to MSY ($F_{recent} > F_{MSY}$)
- The recent levels of **spawning biomass** are estimated to be above the level corresponding to MSY ($S_{recent} > S_{MSY}$)

Summary: key results (cont.)

from SAC1

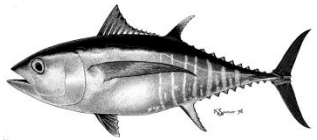
- However, these interpretations are sensitive about the following assumptions:
  - Steepness of stock-recruitment relationship
  - Average size of the oldest fish in the population (L_2)
  - Adult natural mortality levels
  - Historic period of the bigeye exploitation



Plausible Sensitivities and Uncertainties

- lessons from previous assessments

Summary



- Results are more **pessimistic** with:
  - The inclusion of a stock-recruitment relationship
  - Higher values of the average size of the oldest fish (L_2 > 185 cm)
  - Lower rates of adult natural mortality (M)
  - If only the late period of the fishery (1995-2009) is used in the assessment

- Results are more **optimistic** with:
  - Lower values of the average size of the oldest fish (L_2 < 185 cm)
  - Higher rates of adult natural mortality (M)

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Questions?