

Recreation of a gadget model to the Strait of Gibraltar Red seabream fishery analytical assessment (PRX16/00437)



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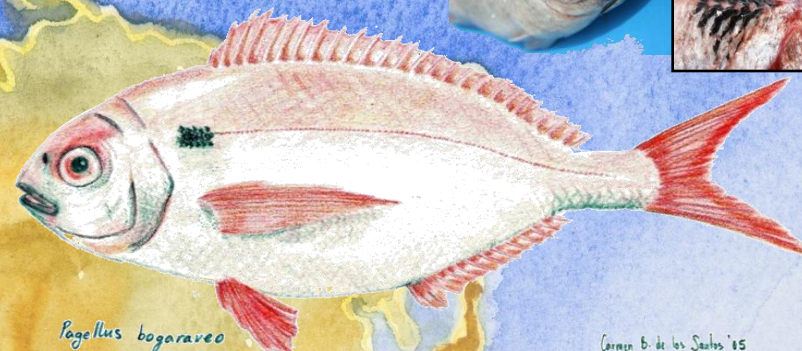
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Marine Research Institute (HAFRO)



GOBIERNO
DE ESPAÑA

MINISTERIO
DE EDUCACIÓN, CULTURA
Y DEPORTE

OUR MAIN CHARACTER



Pagellus bogaraveo

Carmen B. de los Santos '05

Taxonomy: *Pagellus bogaraveo*

Superclass GNATHOSTOMATA

Class ACTINOPTERYGII

Subclass NEOPTERYGII

Division TELEOSTEI

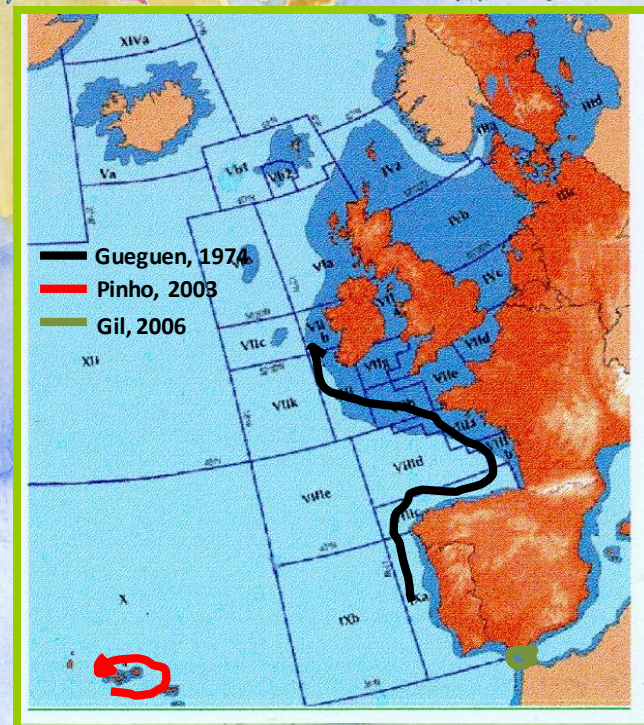
Subdivision EUTELOSTEI

Superorder ACANTHOPTERYGII

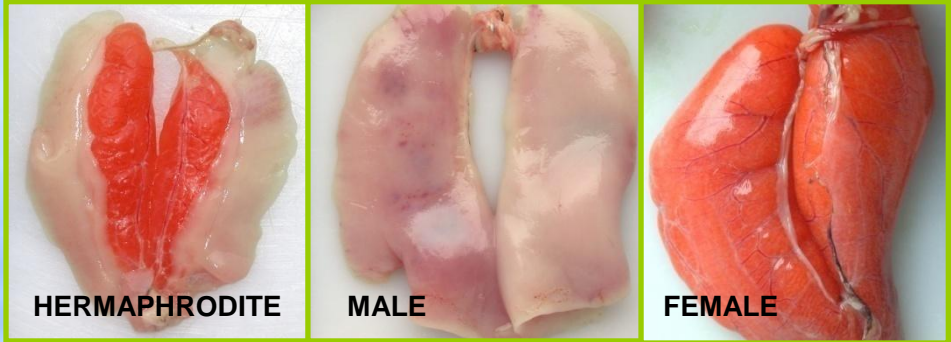
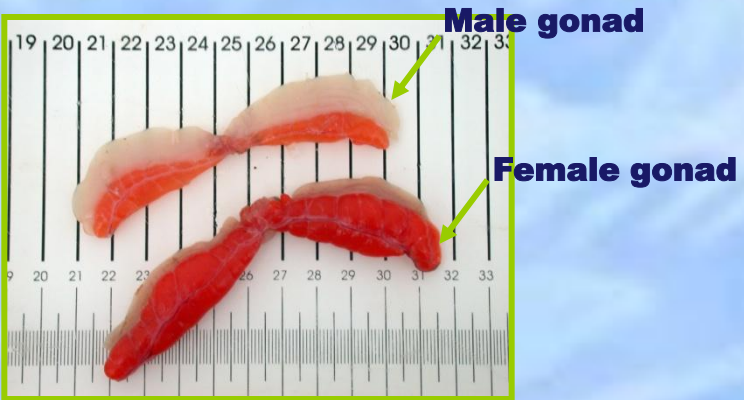
Order PERCIFORMES

Family SPARIDAE

Genus *Pagellus* (Valenciennes, 1830)



FEATURING ITS BIOLOGY



Slow growth

Hermaphrodite: males $L_{50} \pm 30$ cm TL, ± 35 cm TL in females

Spawning season in the 1st quarter

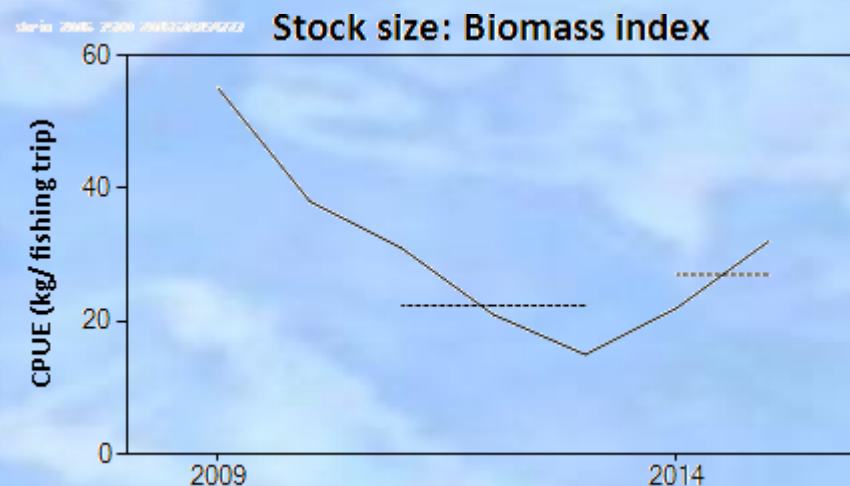
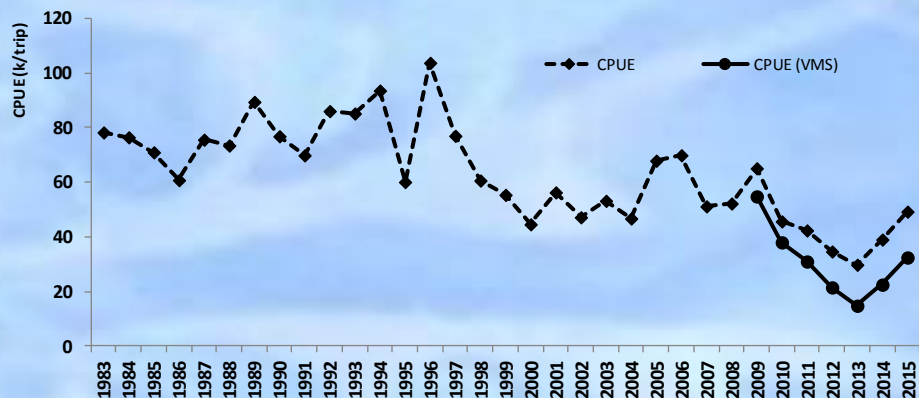
Main preys: small crustaceans and deepwater fish

¿Predators?



ONE FRAMEWORK: LAST ICES ADVICE (2017-2018)

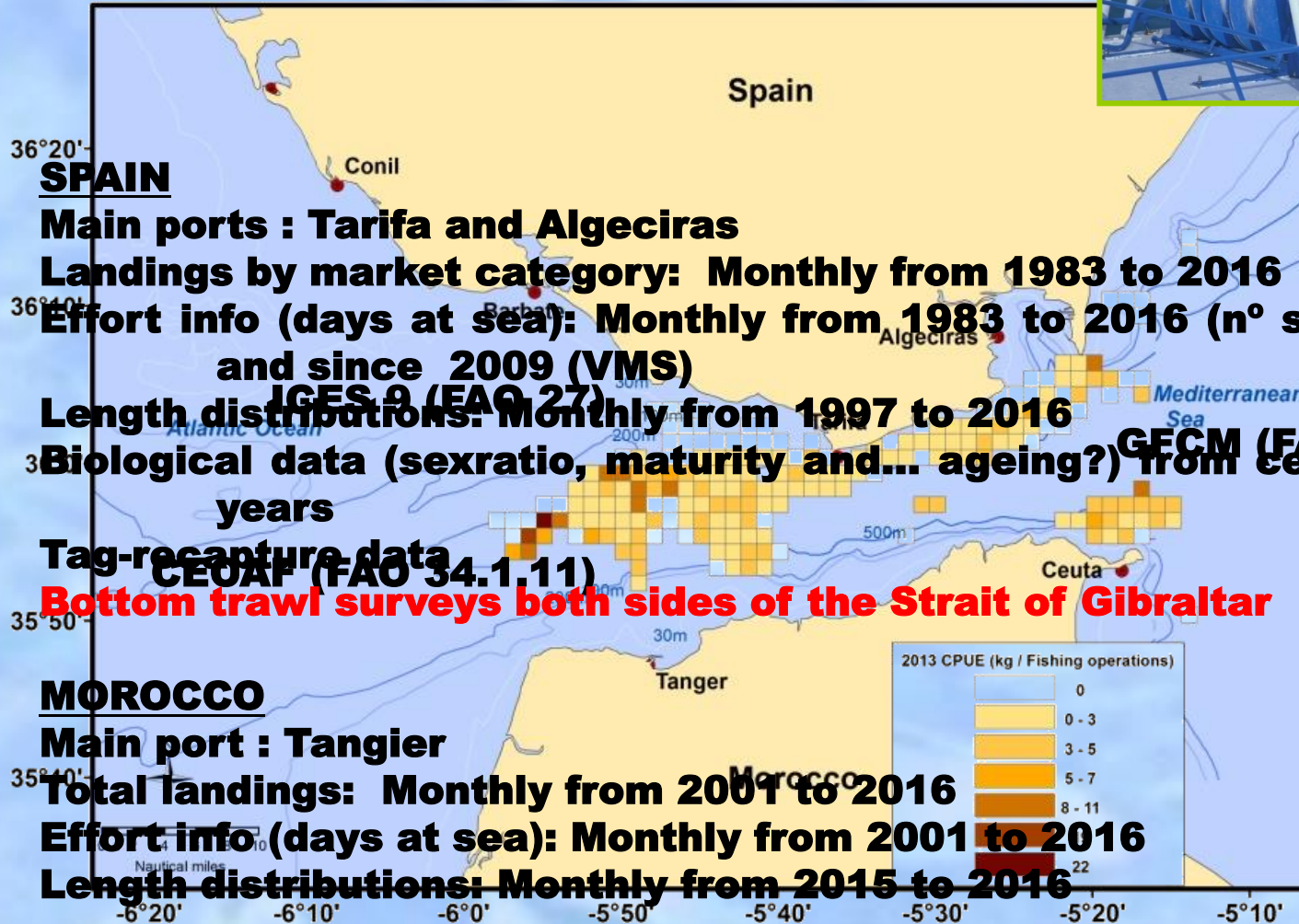
“ICES advises that when the Precautionary Approach is applied, catches should be no more than 138 tonnes in each of the years 2017 and 2018. All catches are assumed to be landed. ICES notes that the distribution of the stock extends outside Subarea 9 and catch statistics are incomplete. ICES recommends the establishment of a management plan that covers the entire stock distribution area”



Index A (2014–2015)	27	
Index B (2011–2013)	22	
Index ratio (A/B)	1.23	
Uncertainty cap	Applied	1.20
Recent advised catch (2015–2016)	115 t	
Discard rate	Negligible	
Precautionary buffer	Not applied	-
Catch advice *	138 t	

THE MOVIE: SoG (TARGET) FISHERY

ICES Division 9?



SPAIN

Main ports : Tarifa and Algeciras

Landings by market category: Monthly from 1983 to 2016

Effort info (days at sea): Monthly from 1983 to 2016 (n° sales) and since 2009 (VMS)

Length distributions: Monthly from 1997 to 2016

Biological data (sexratio, maturity and... ageing?) from certain years

Tag-recapture data

Bottom trawl surveys both sides of the Strait of Gibraltar

MOROCCO

Main port : Tangier

Total landings: Monthly from 2001 to 2016

Effort info (days at sea): Monthly from 2001 to 2016

Length distributions: Monthly from 2015 to 2016



THE PLOT: MOVING TO (GADGET) ANALYTICAL ASSESSMENT

gadget has successfully been used to investigate the population dynamics of some WGDEEP stocks in Icelandic waters.

The SBR in ICES 9 is not benchmarked yet

Iceland internship opportunity (grant PRX16/00437)



...shoveling time!!

AND....LET'S GADGET!!

Learning from tusk and ling models (ICE)

Suiting R codes to Spanish and Morocco data

MareFrame DB Access and Rgadget packages

The screenshot displays the RStudio interface with the following components:

- Source Editor:** Contains R code for setting up the gadget model. The code includes comments and library calls for `mfdb`, `tidyverse`, `devtools`, and `Rgadget`. It defines a gadget directory, connects to the `cadiz` database, and sets `bootstrap` to `FALSE`.
- Environment:** Lists objects in the global environment, including `species_name` (a character vector), several `SPLandings` objects (lists), `SPnominaleffort`, `SPstandardizedef...`, `stock_names` (a character vector), `tmp` (a list), and `year_range` (an integer vector).
- Console:** Shows the execution of `plot` functions for catch, suitability, and length distribution. It displays warning messages about deprecated `panel.margin` and `geom_path` functions.
- Files Panel:** Shows the file structure of the project, including folders for `sbrVersions`, `sbrmodel`, `SBR data`, `RCodes`, and `R`.

THE SHOT: WHAT ARE/DID WE DOING/DO?

Population Model

- **One area (SoG)**
- **1983 to 2016**
- **Steps (quarters)**



2 stock components: males and females (instead of immatures and matures)

Length weight relationship (from biological samplings)

M = 0.2 assumption for all ages every year

#Recruits at age 0 from 1983 to 2016, estimated by the model

#Abundance at age (1 to 17) at first year (1983), estimated by the model

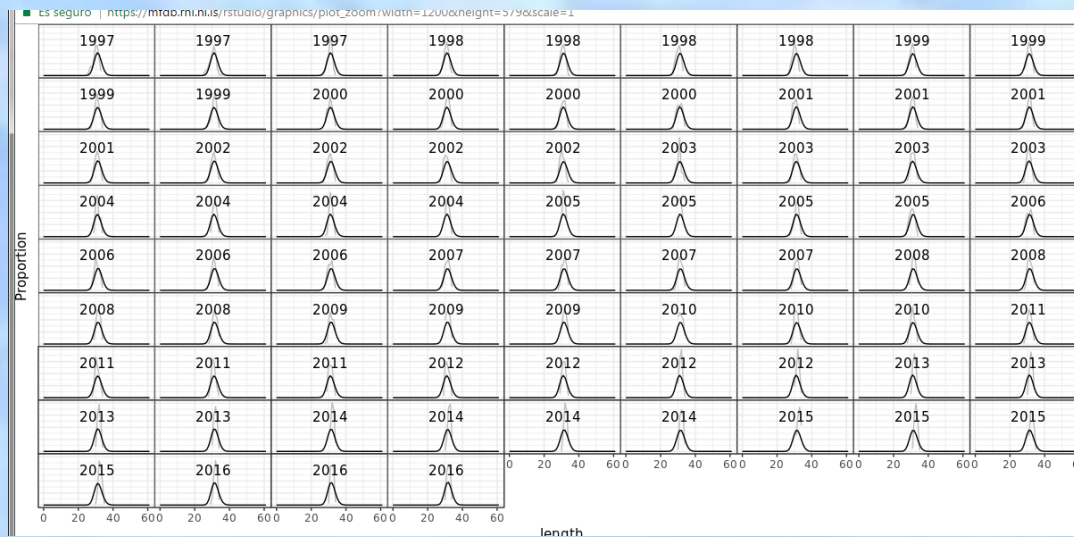
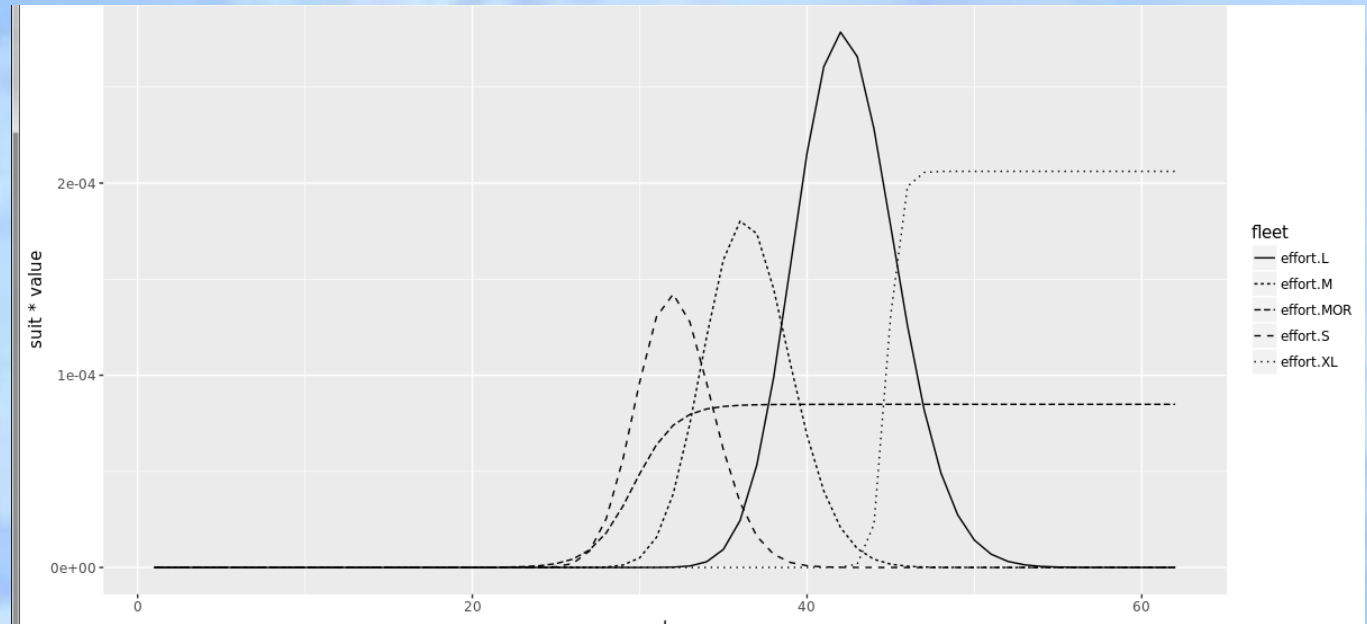
#Growth: VBGF parameters, could be estimated by the model or fixed by the user (L_{∞})

Fishing model

Effort data (Spain and Morocco) as linear fleets (#q)

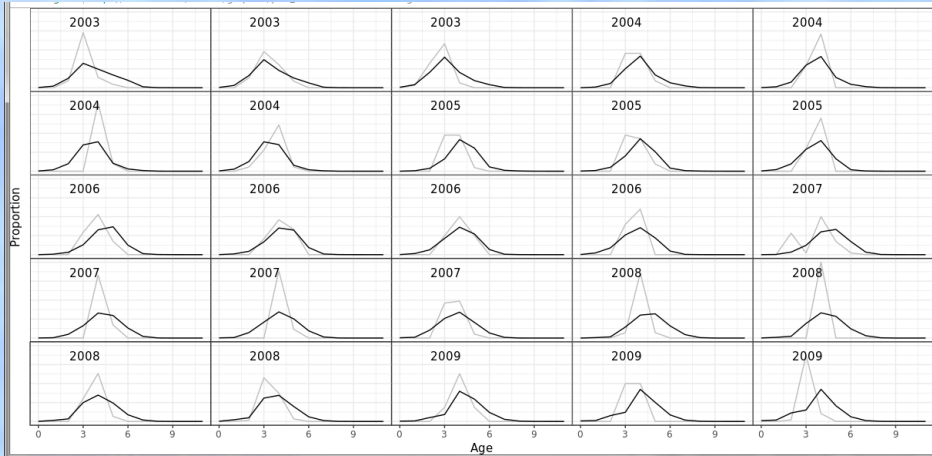
Landings, length distributions and biological info are also disaggregated according to these fleets

... the fancy ones 😊



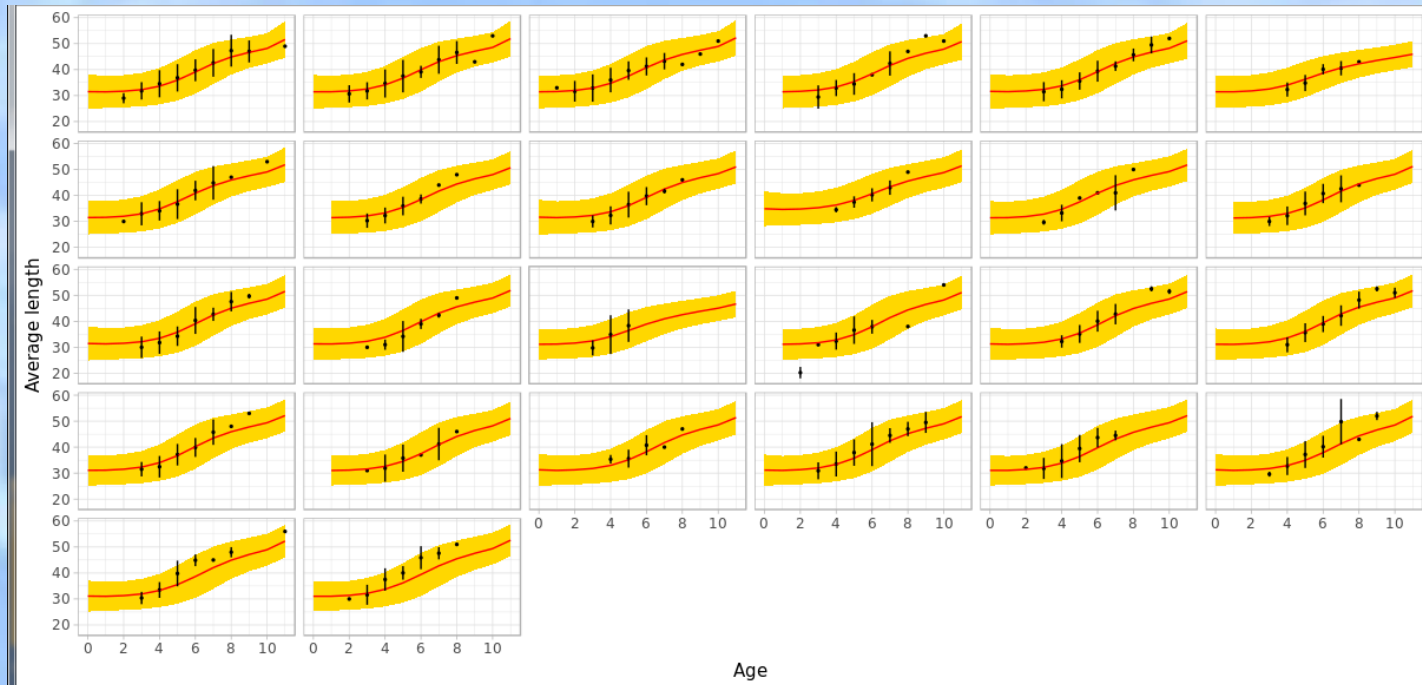
Fleets suitability

RSB SoG MODEL MAIN RESULTS



**... not so fancy but
better than expected!!**

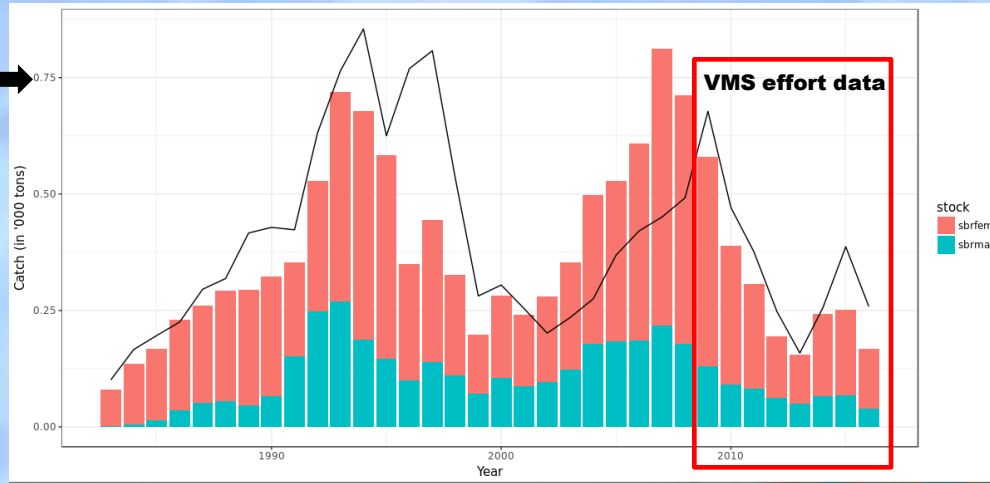
Age and growth



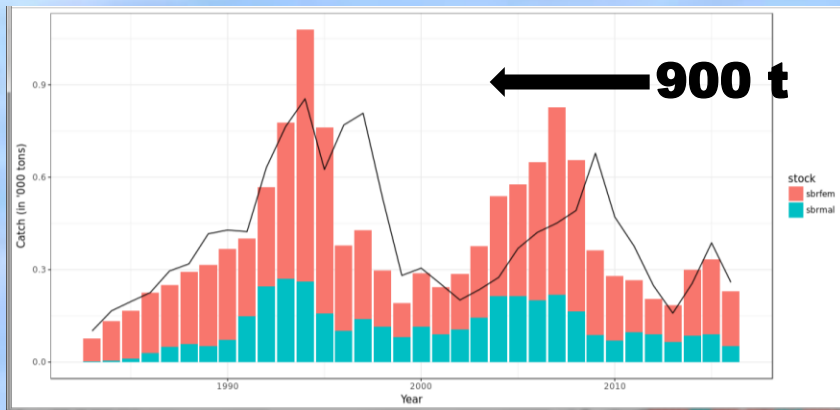
RSB SoG MODEL MAIN RESULTS

ESTIMATED CATCHES vs. REPORTED LANDINGS

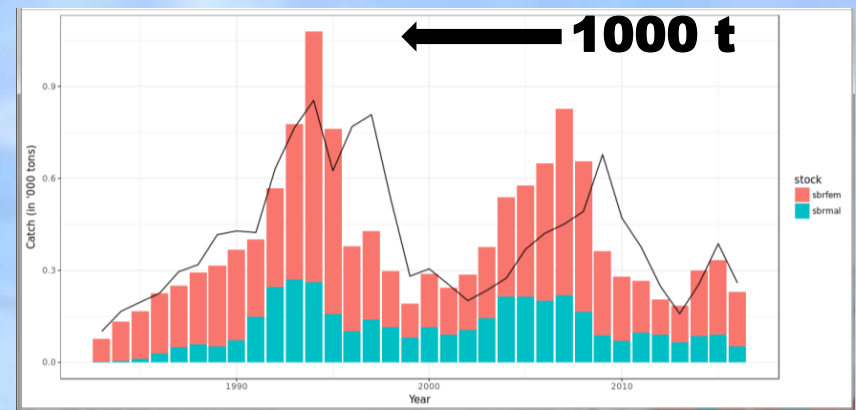
750 t



Spain and Morocco effort info

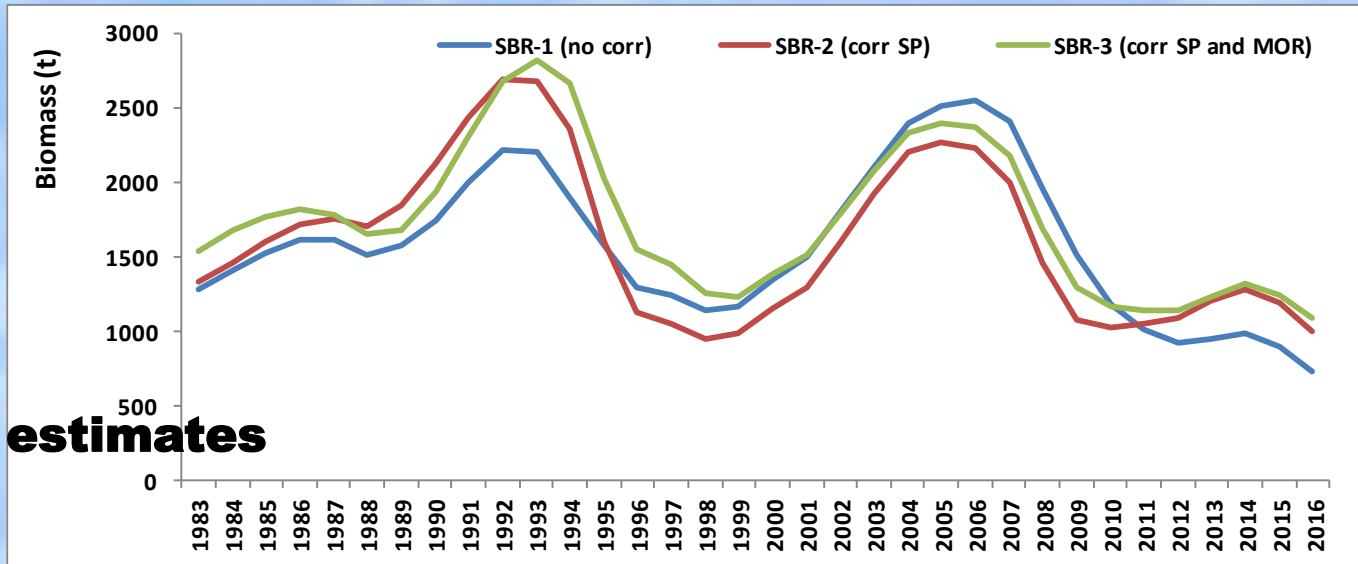


Spain (corrected) and Morocco

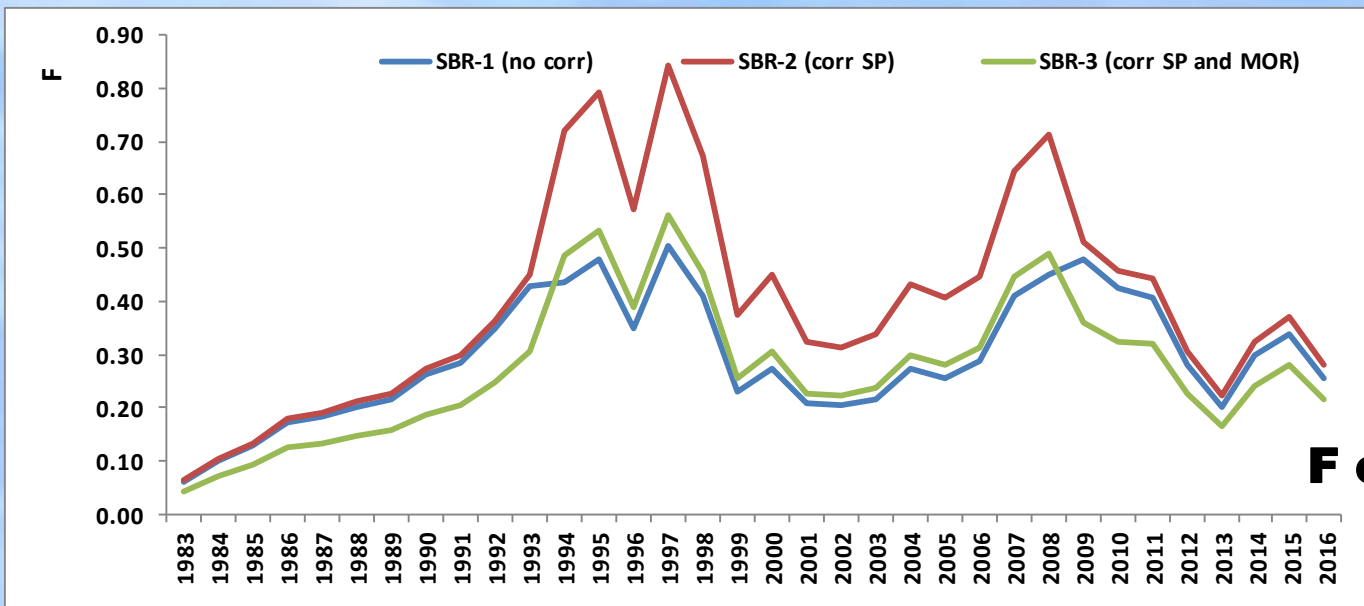


Both corrected (SP and MOR)

RSB SoG MODEL MAIN RESULTS



Biomass estimates



F estimates

.... 3 possible scenarios from 3 different effort data series

Tag-recapture info

Looking forward (projections and reference points) to give the advice for the population (and fishery) recovery/sustainability

AMARE-MED 2017: V. Bartolino (gadget) and A. Punt (MICE)

Possibilities of include other species in the model (Atlantic bluefin tuna)

GFCM meeting (November 2017)

ICES Benchmark (2019), unless stock identity unsolved issue. Size composition from the by-catch fisheries (Spain and Portugal) might be different than the Strait of Gibraltar target fishery

SBR model publication possibilities?

Any comments/ideas?

**Takk fyrir hvatningu!!
Thanks for cheering!!**