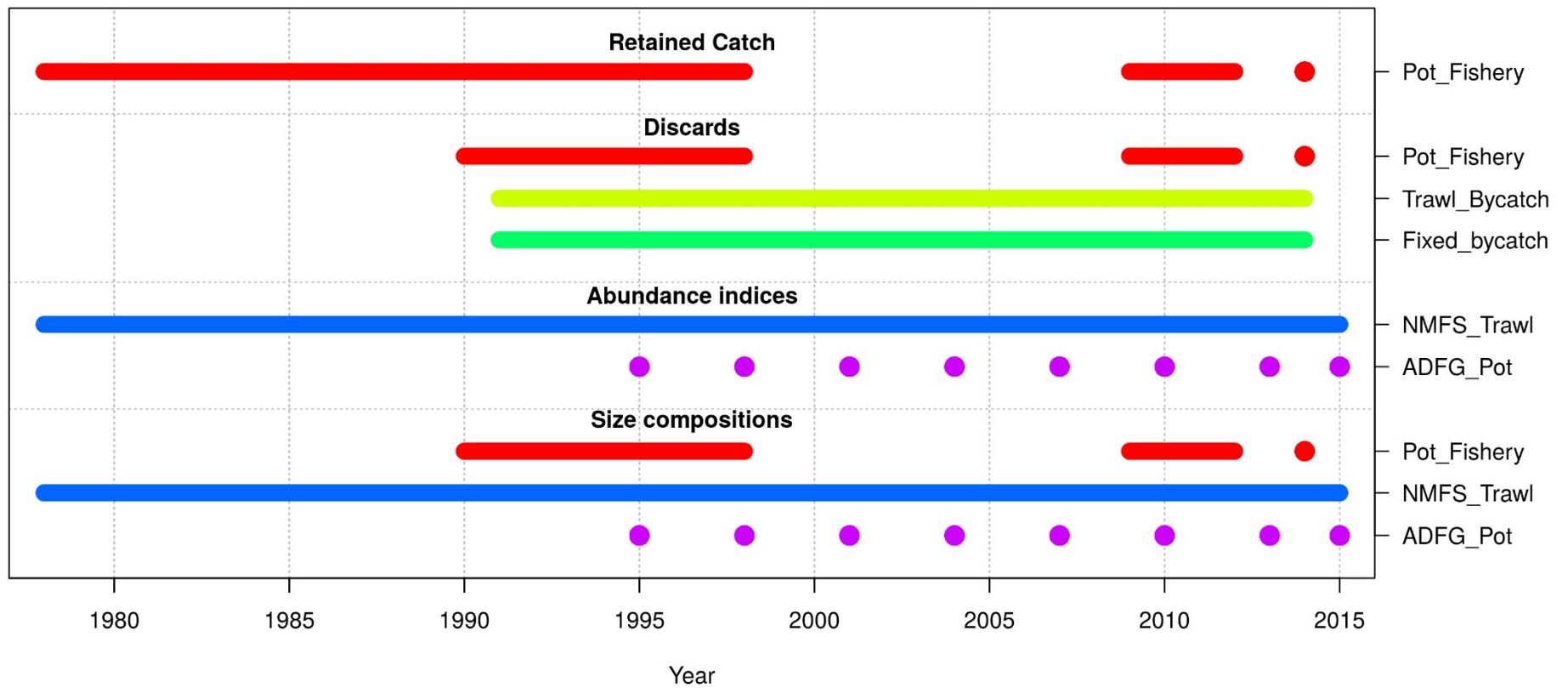


Gmacs application:
St. Matthew Island Blue
King Crab
(SMBKC)

The Gmacs team

Data



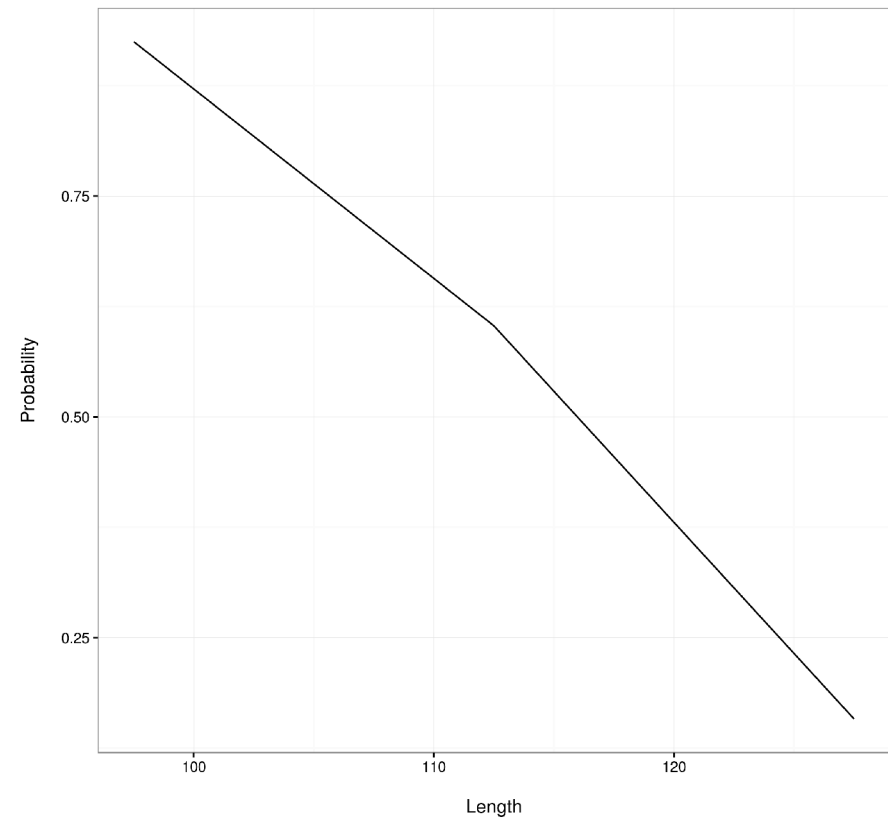
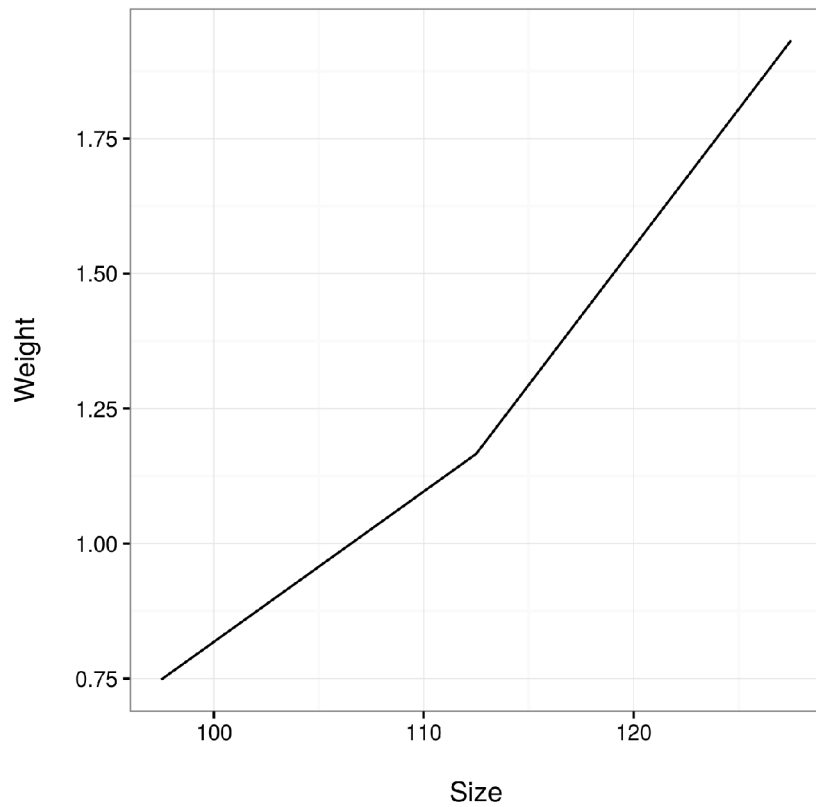
Model specifications

- 1978 – 2015
- 1 sex, 1 shell condition type, 1 maturity type
- 3 size-classes (size breaks at 90 105 120 135)
- Growth, maturity, and molting all fixed

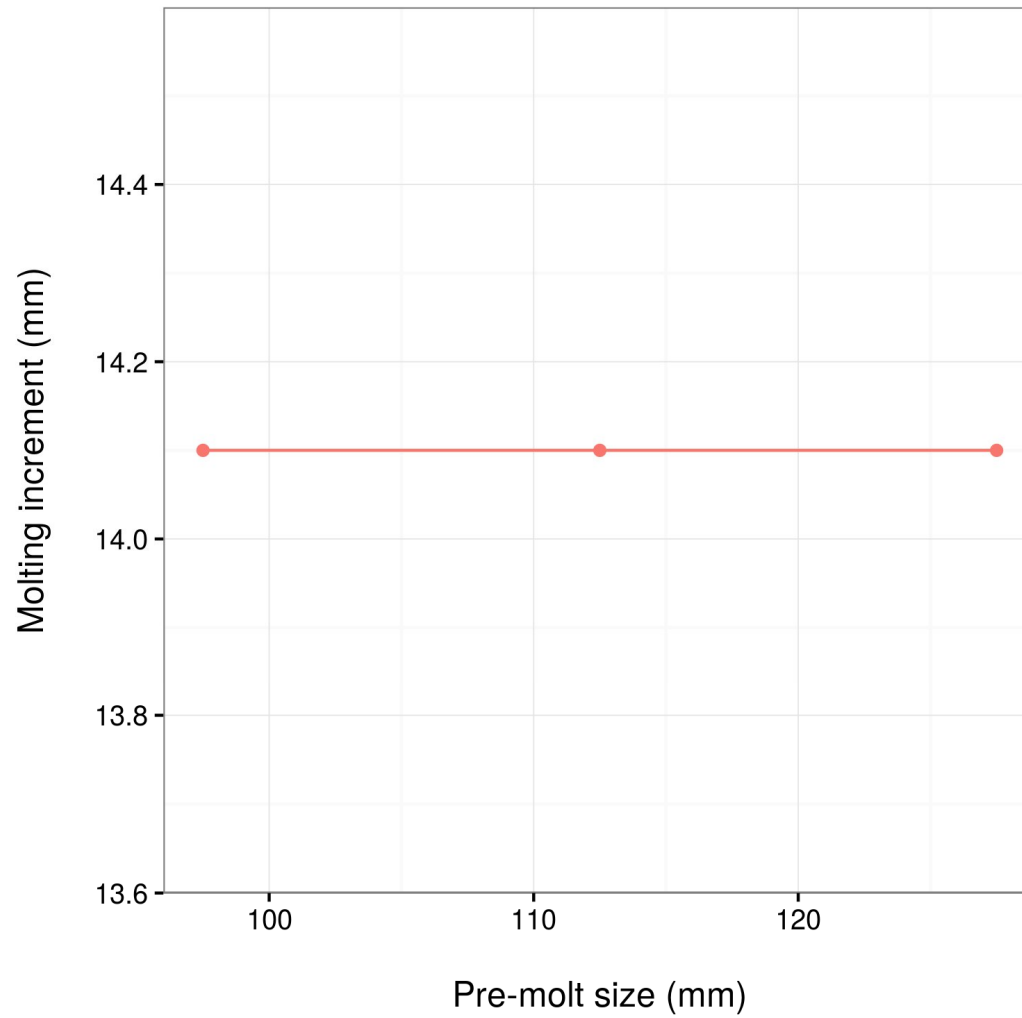
Model specifications

- Parametric selectivity used (i.e. parameter per length class), uniform priors for all parameters
- Additional CV estimated for ADFG Pot survey with uniform prior, no additional CV for NMFS Trawl survey
- Dirichlet for size composition data, estimating scale parameter (i.e. effective sample size), no aggregation
- Natural mortality constant and fixed at $M=0.18$

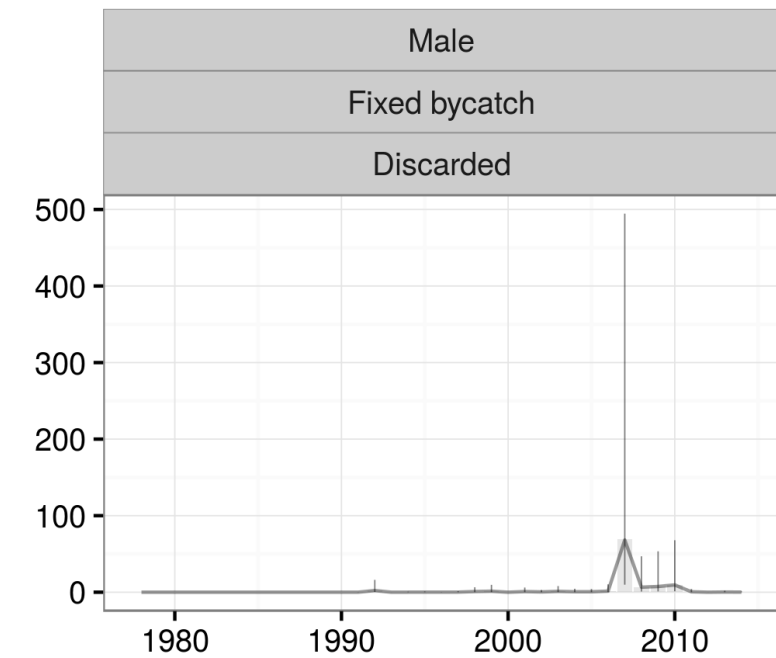
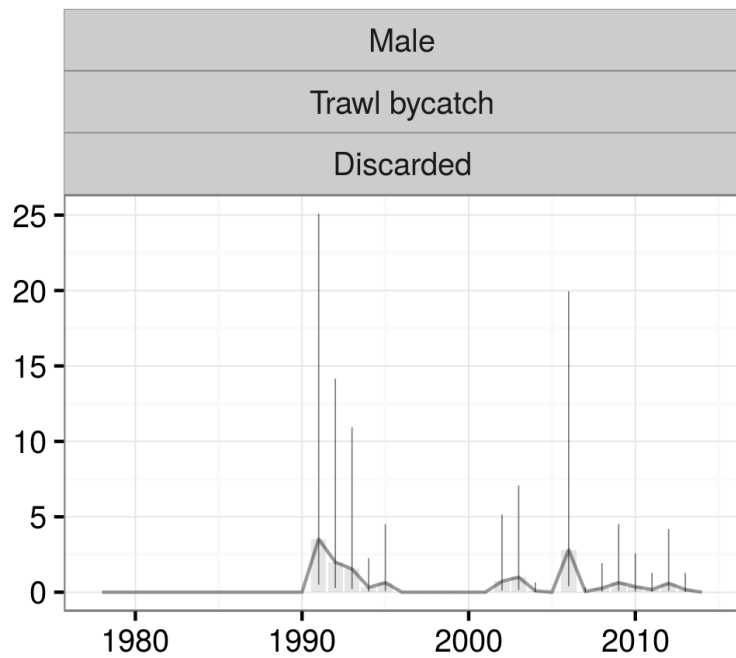
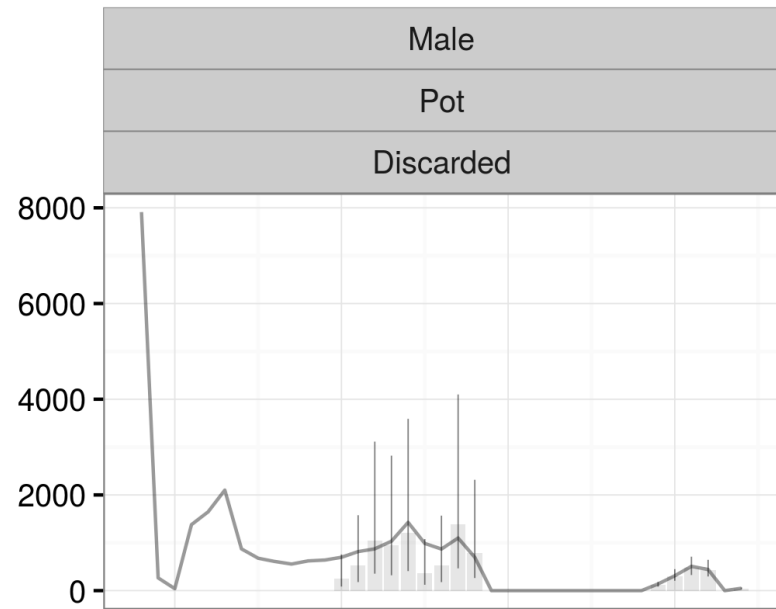
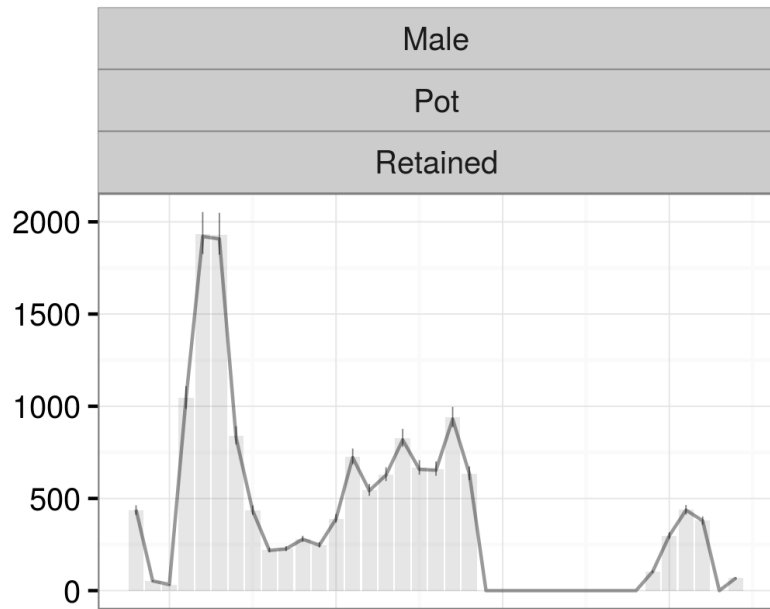
Length-weight and molting probability



Molting increment

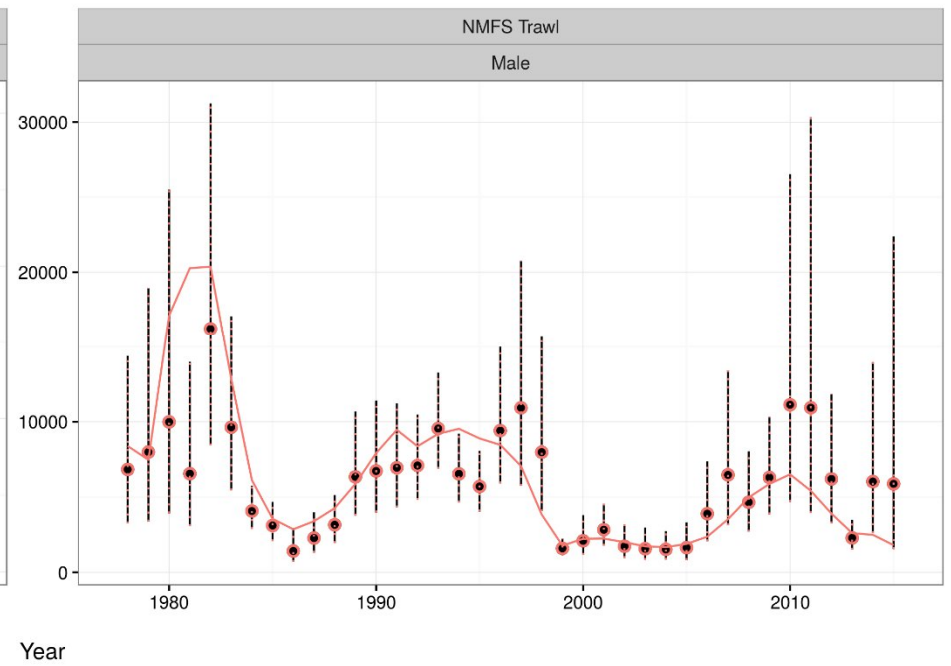
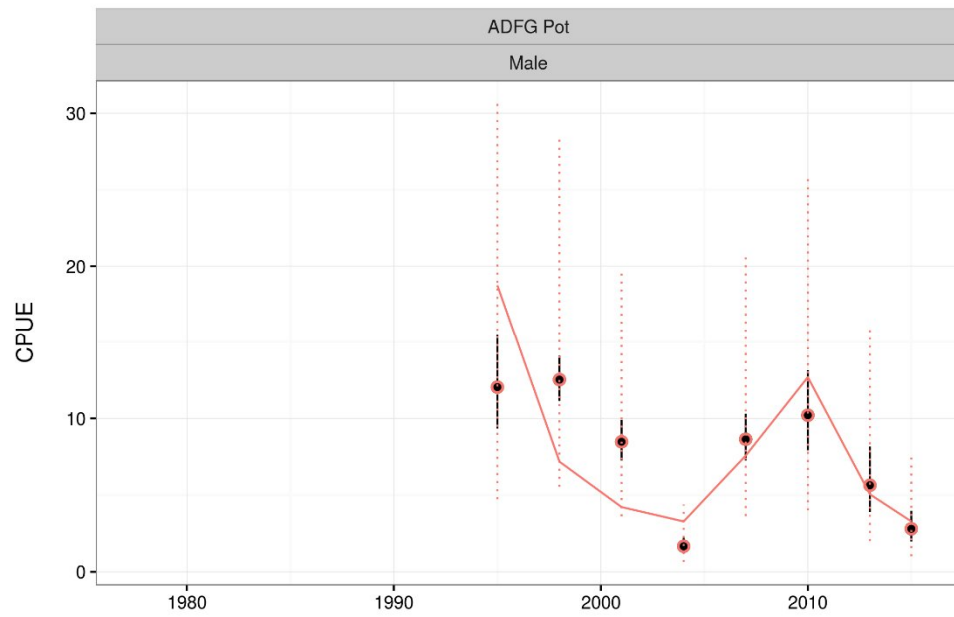


Catch



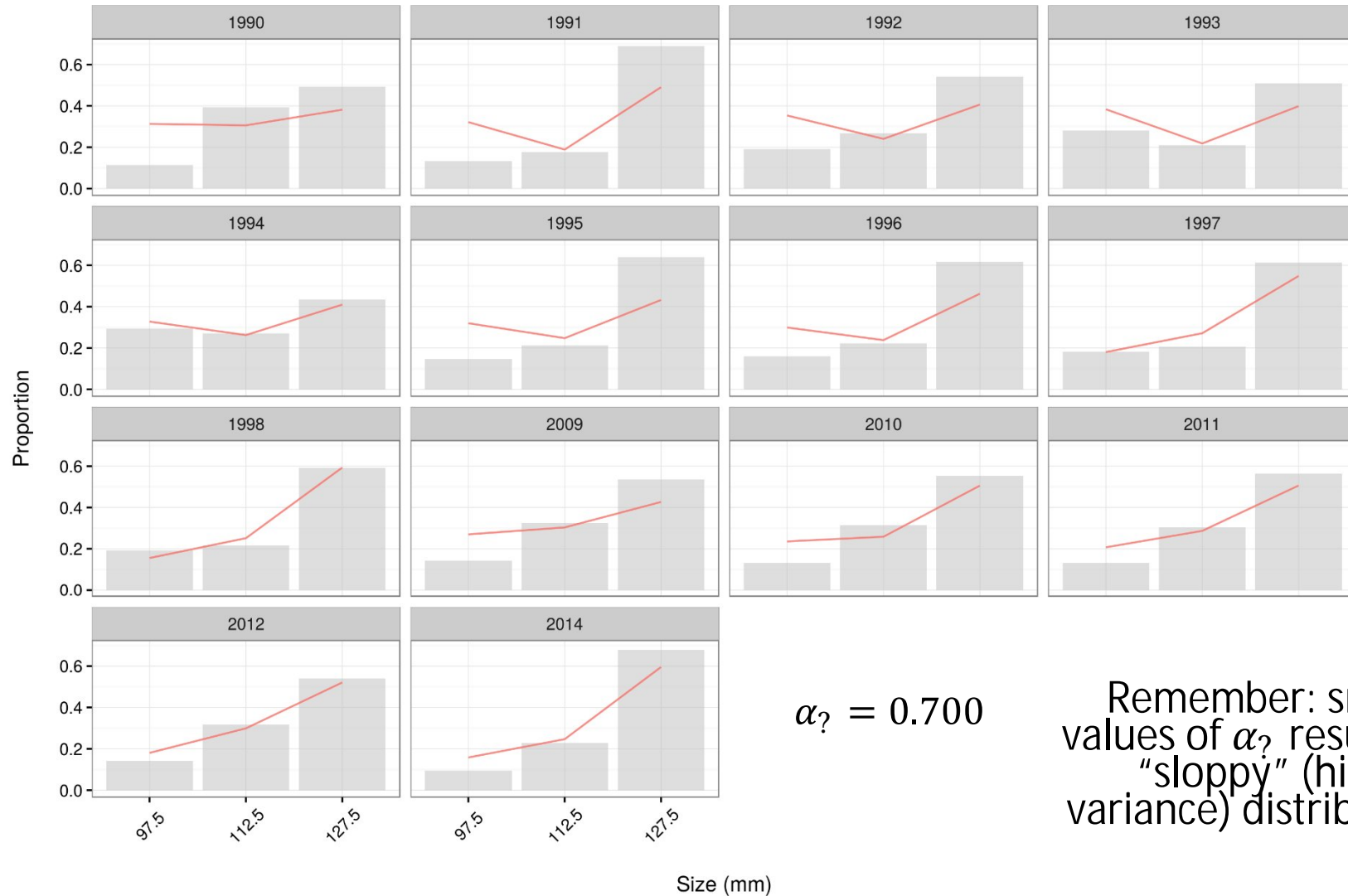
Year

Fit to surveys



Fit to size-compositions

Gear = Pot , Sex = Male

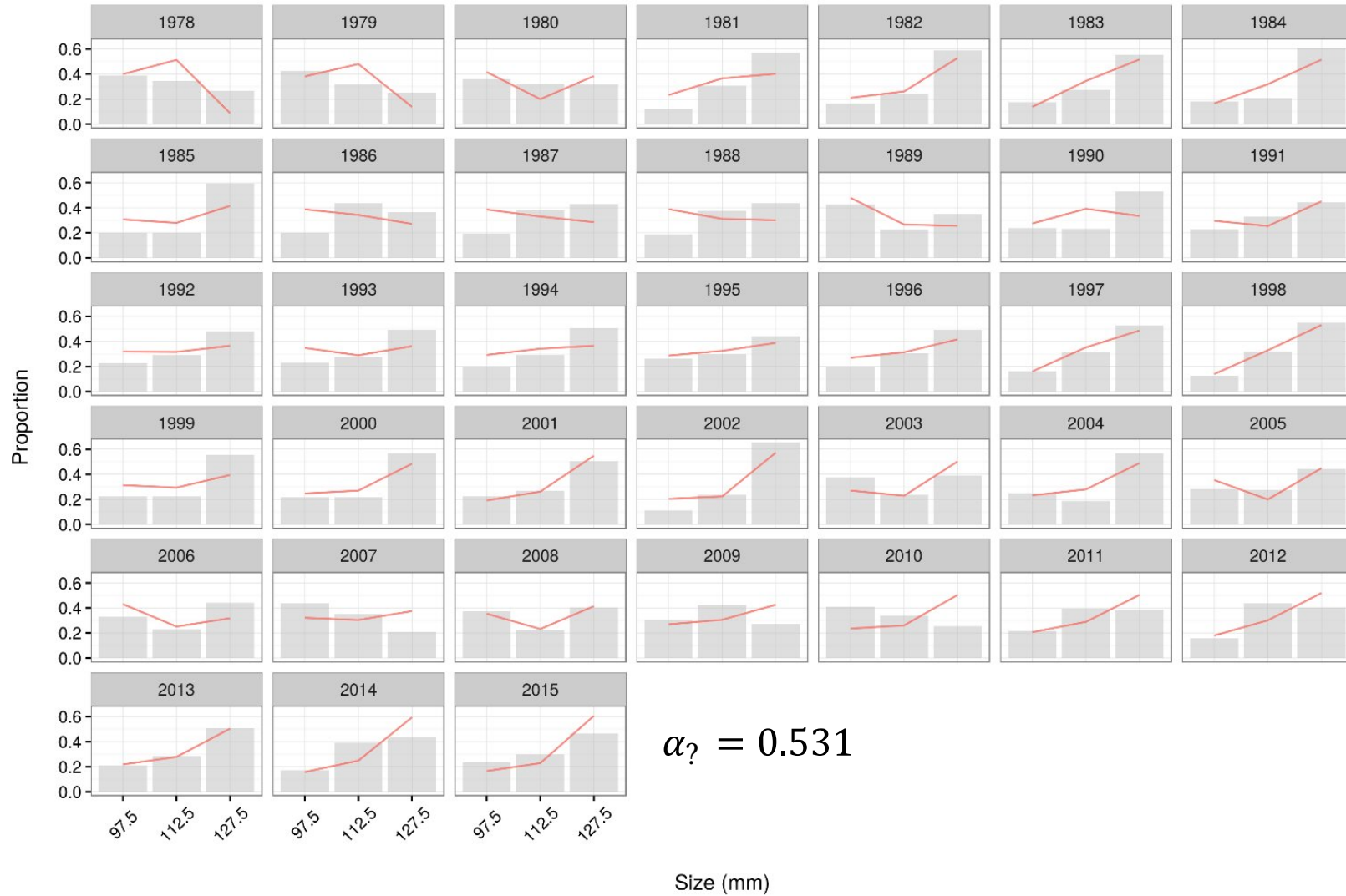


$$\alpha_? = 0.700$$

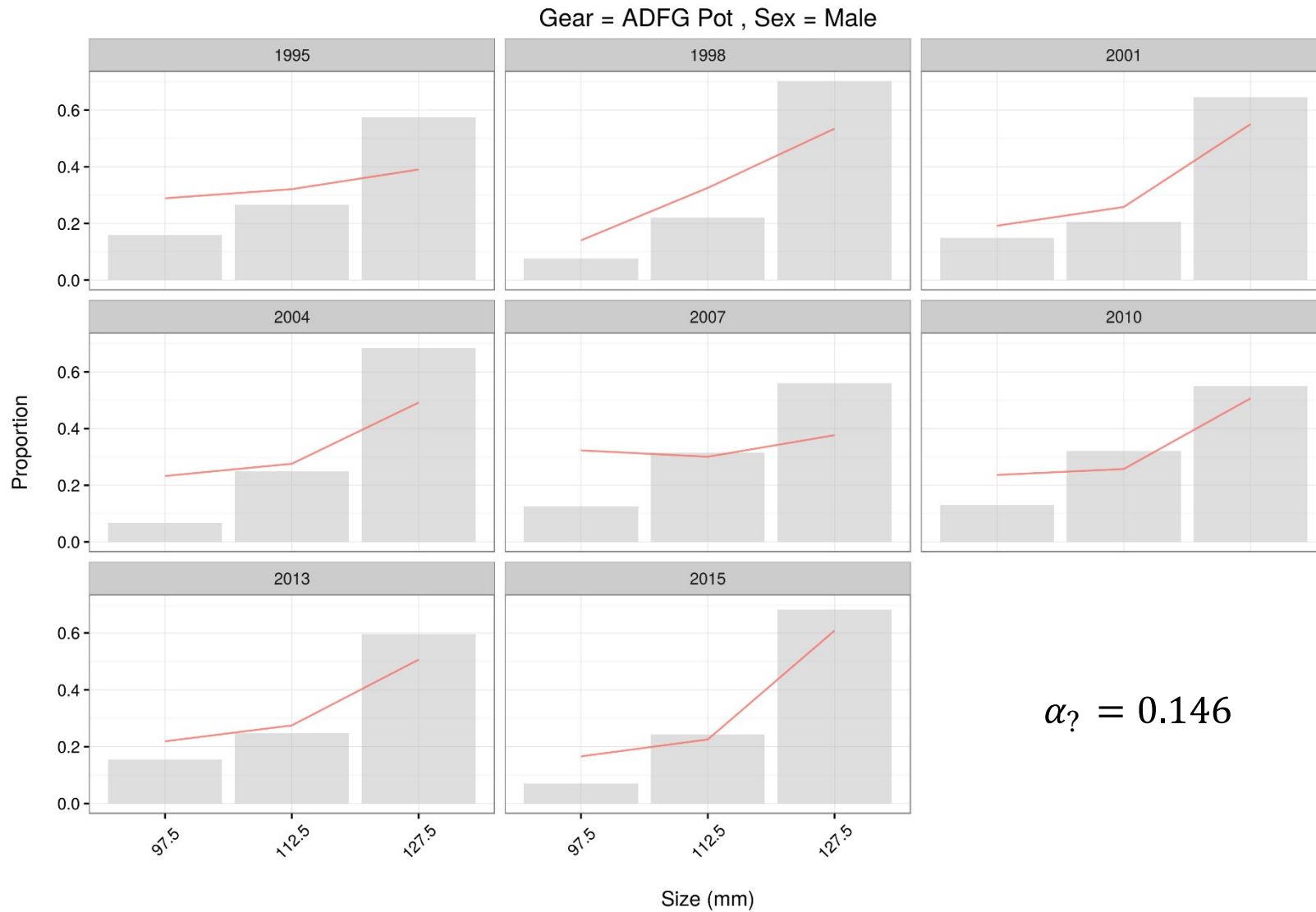
Remember: small values of $\alpha_?$ result in a "sloppy" (high variance) distribution.

Fit to size-compositions

Gear = NMFS Trawl , Sex = Male

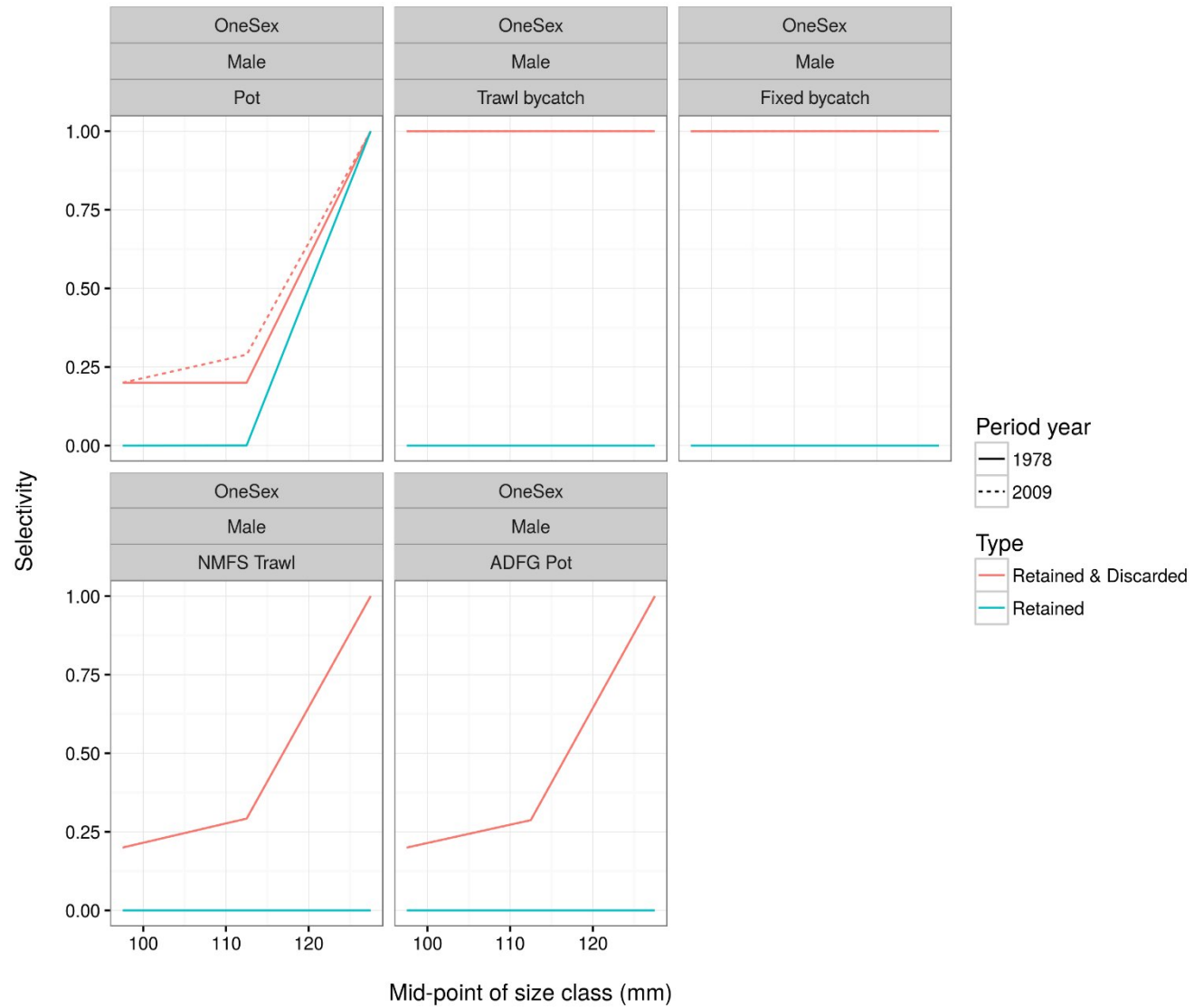


Fit to size-compositions

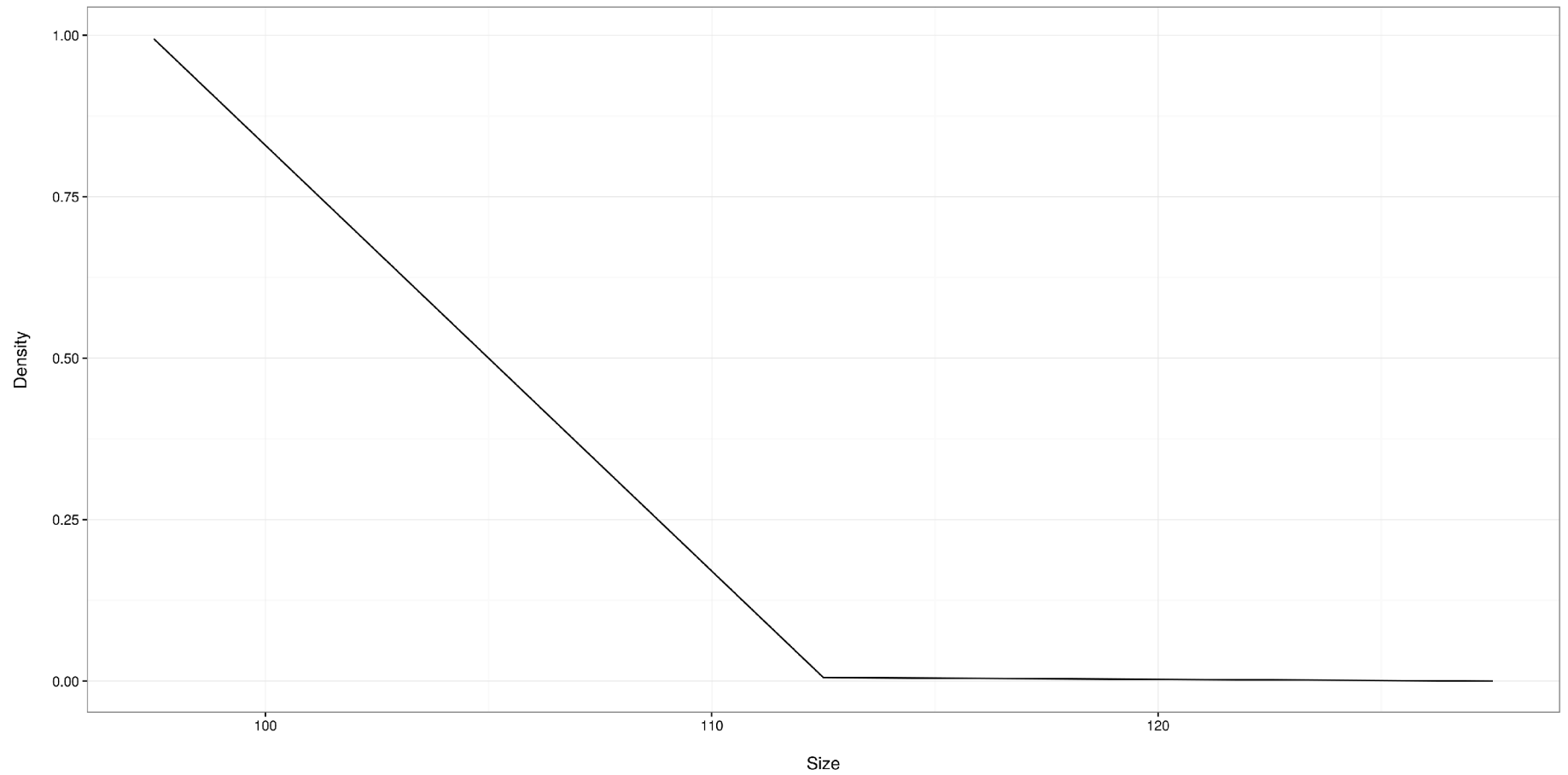


$$\alpha_? = 0.146$$

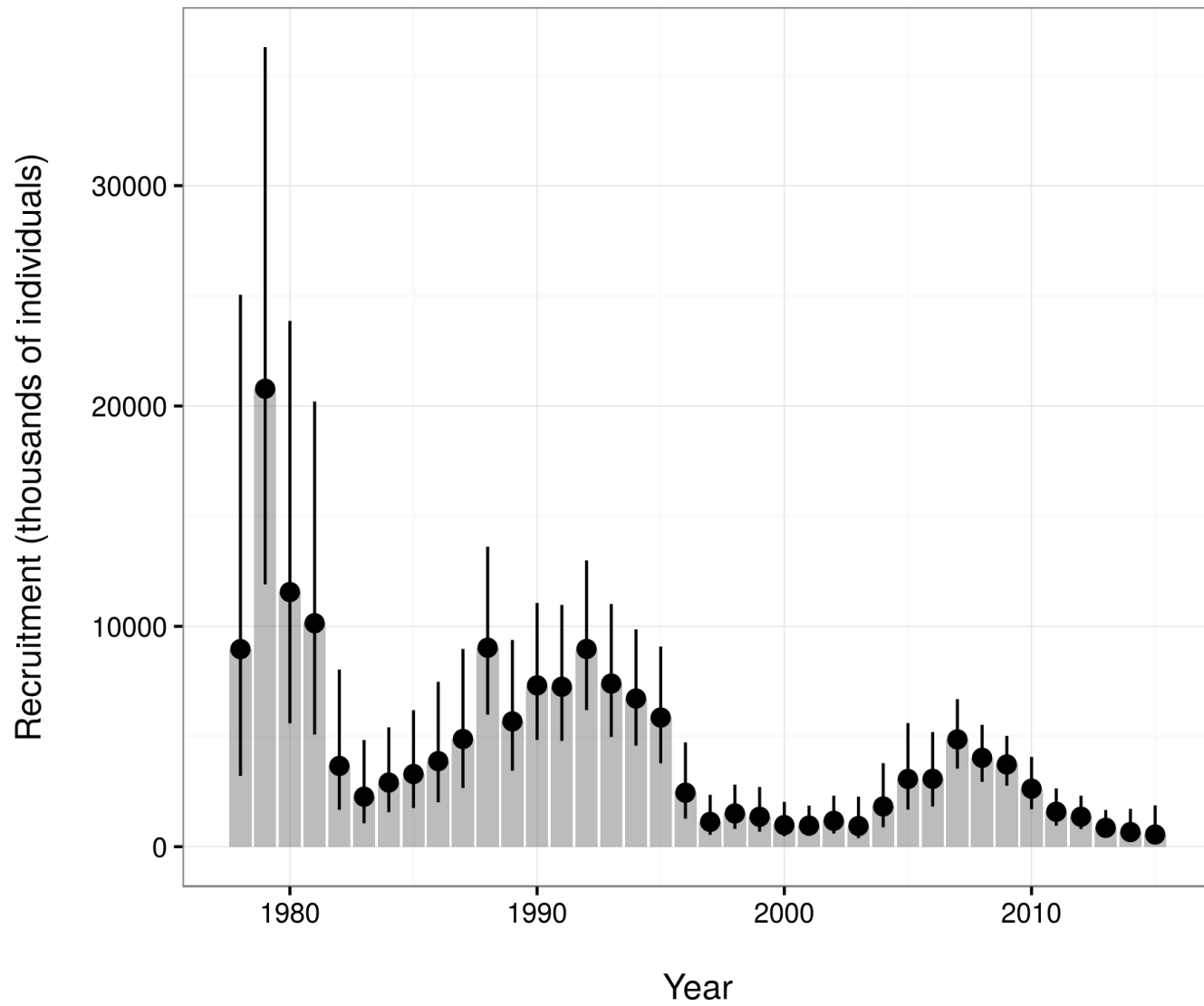
Selectivity



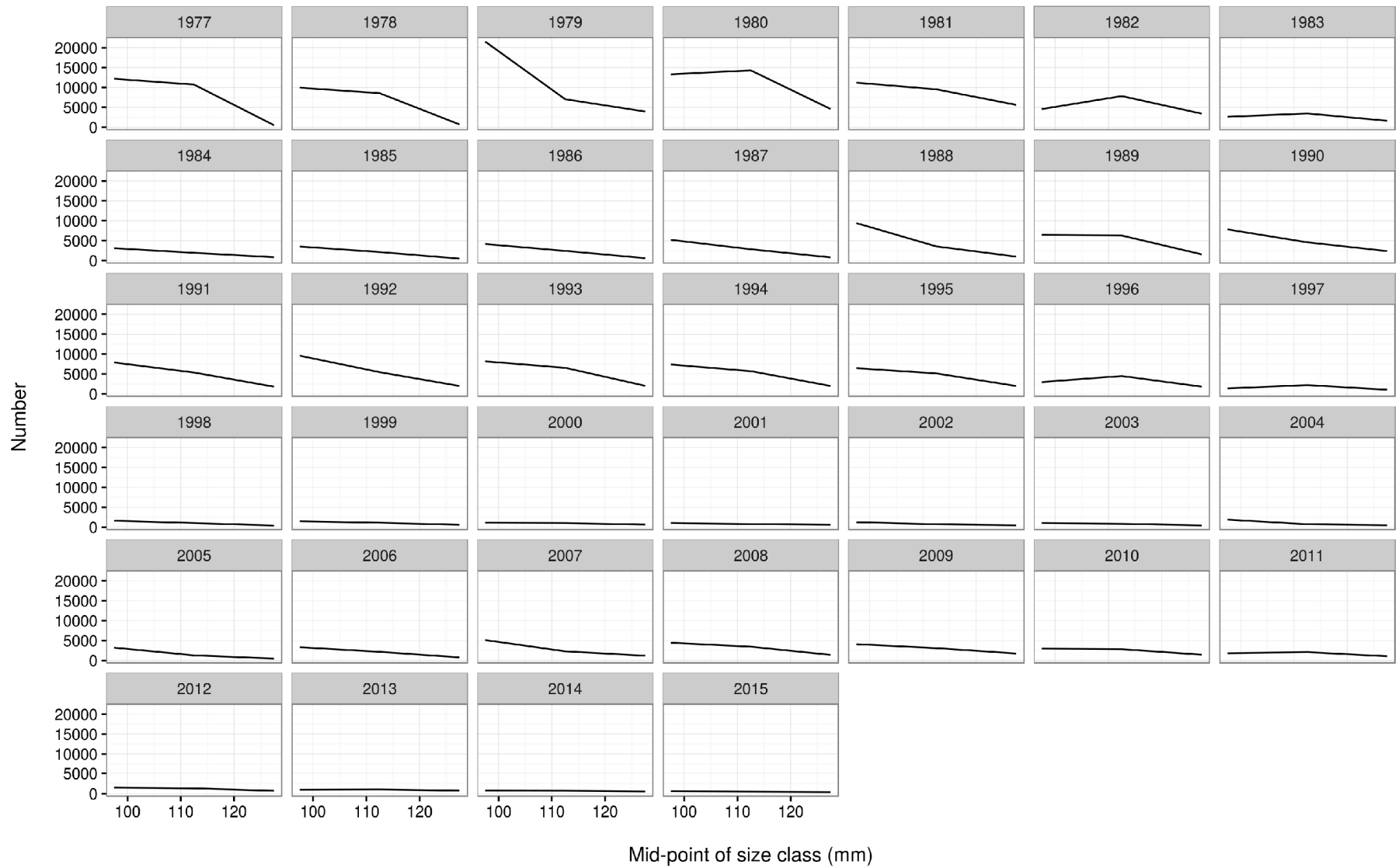
Recruitment size



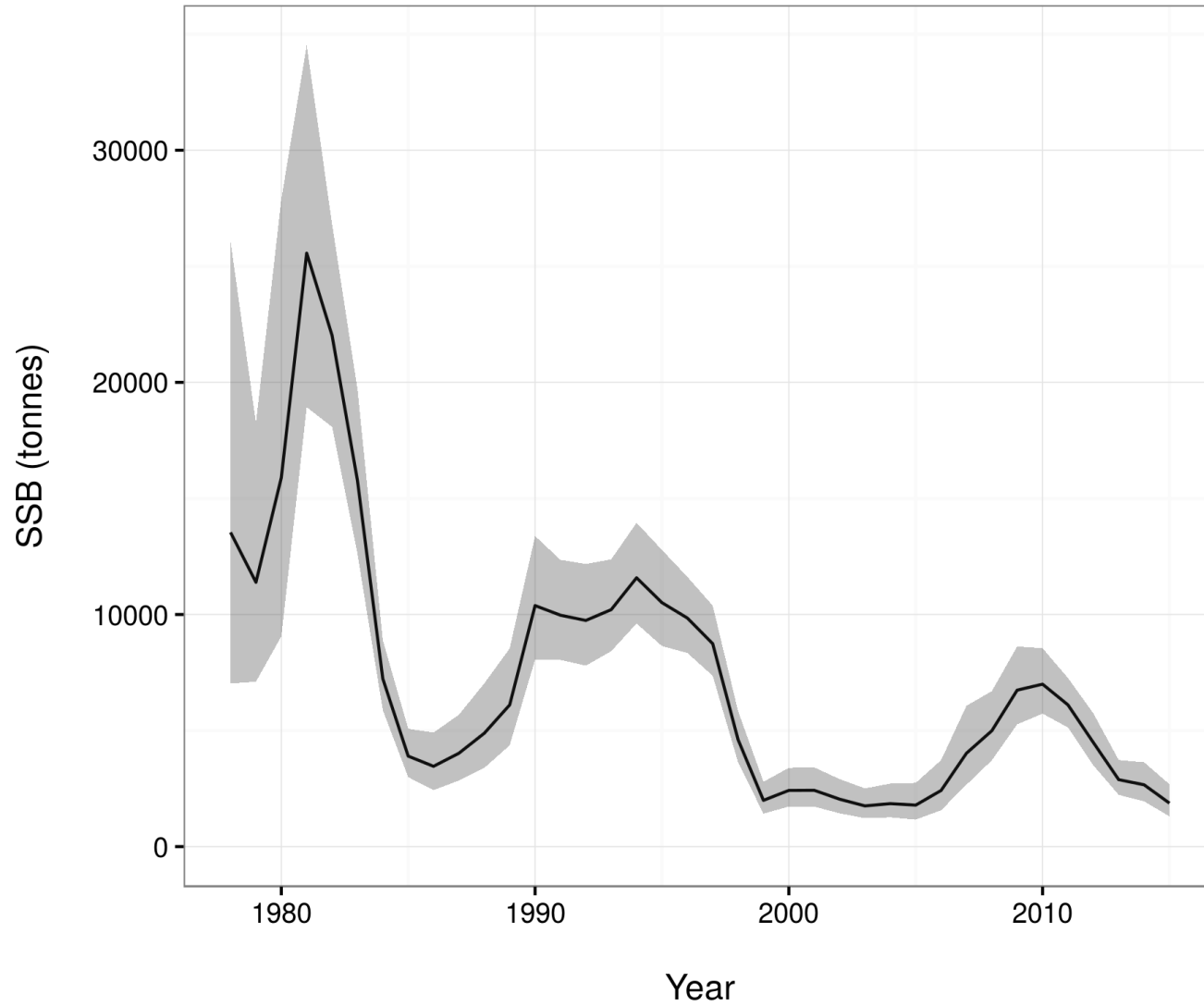
Recruitment



Numbers

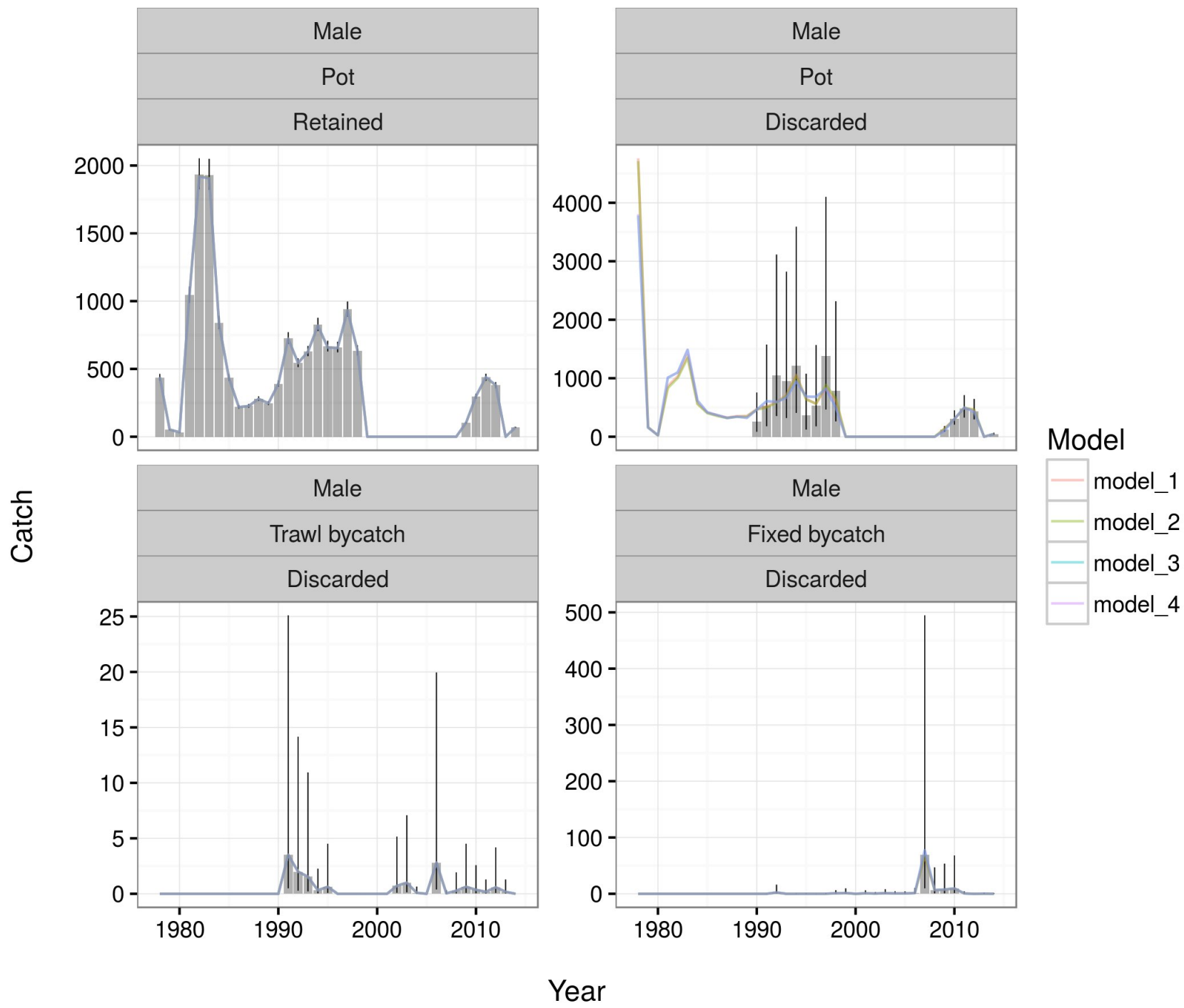


Spawning stock biomass

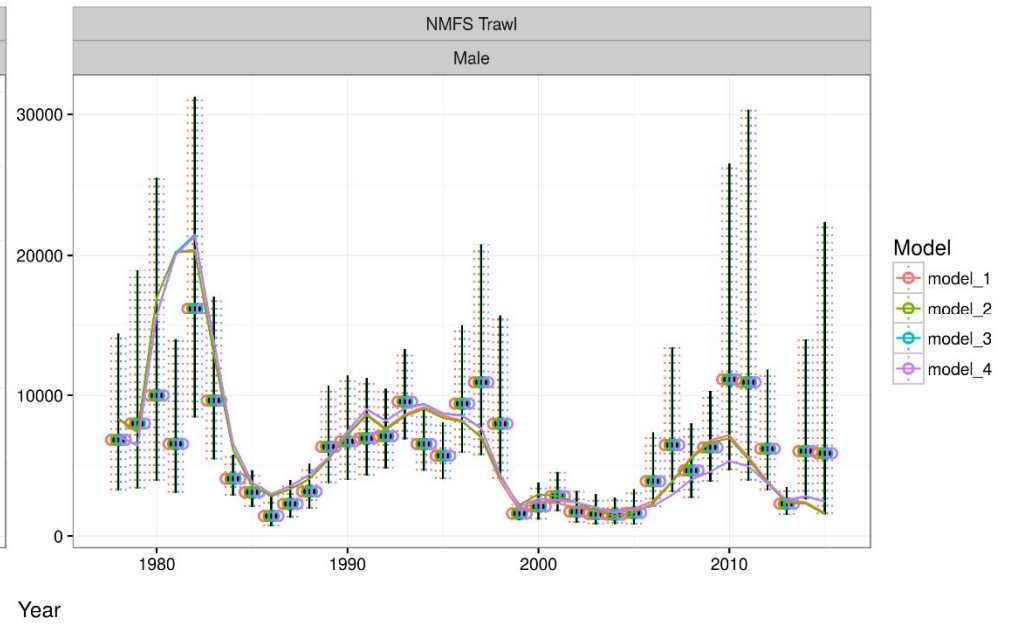
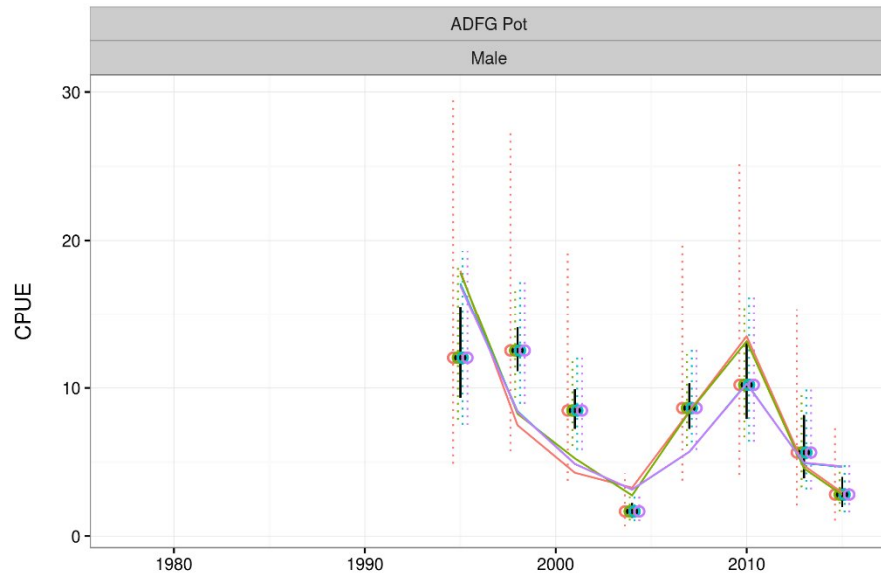


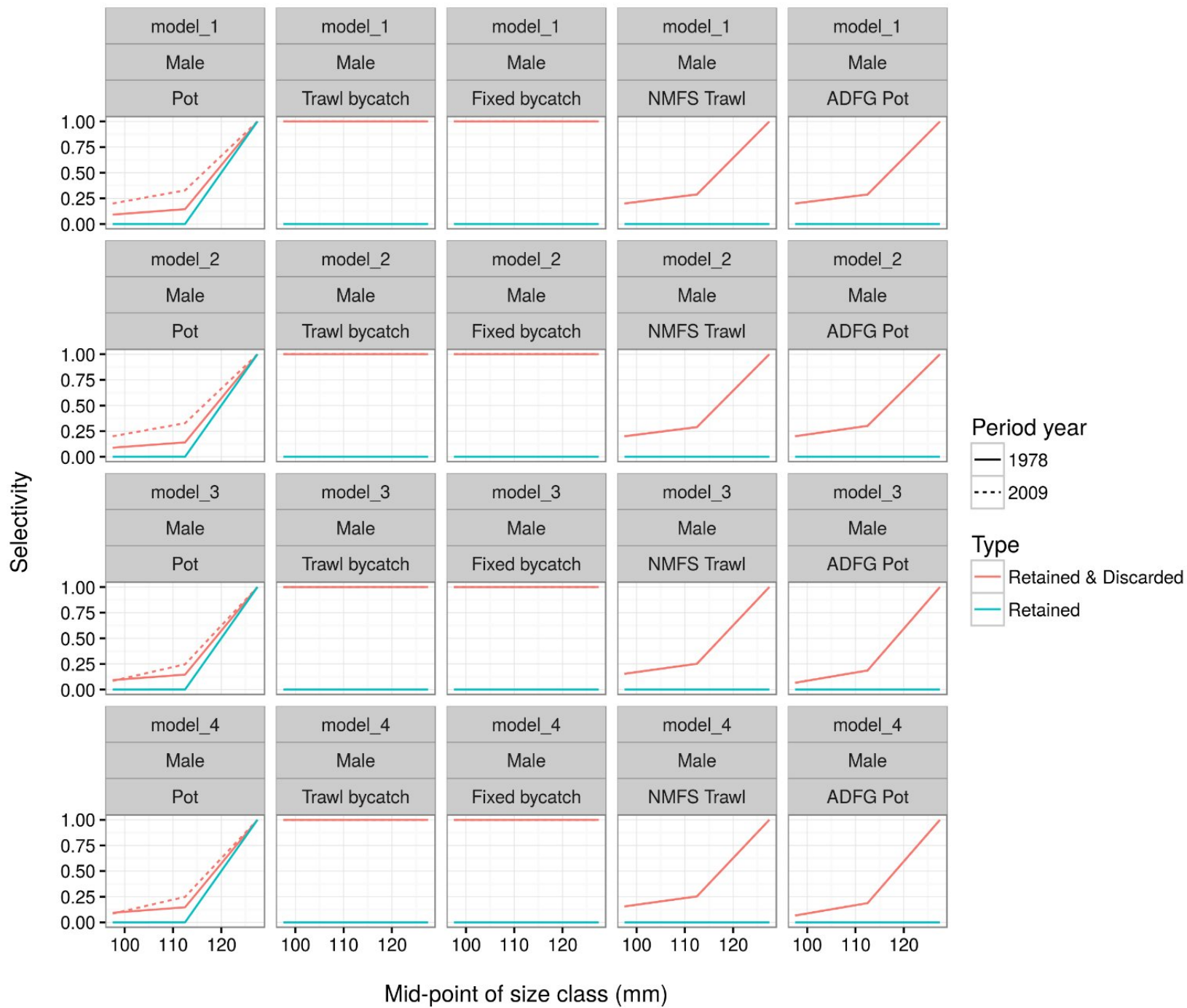
Multiple model scripts

- Makefile
 - Typing `make -j N` at the command line will run all models within independent directories and produce plots showing the different models using the R package `gmr`
- Models run
 1. As above
 2. + gamma prior on added CV
 3. + using multinomial & not estimating Eff. N
 4. + estimate M

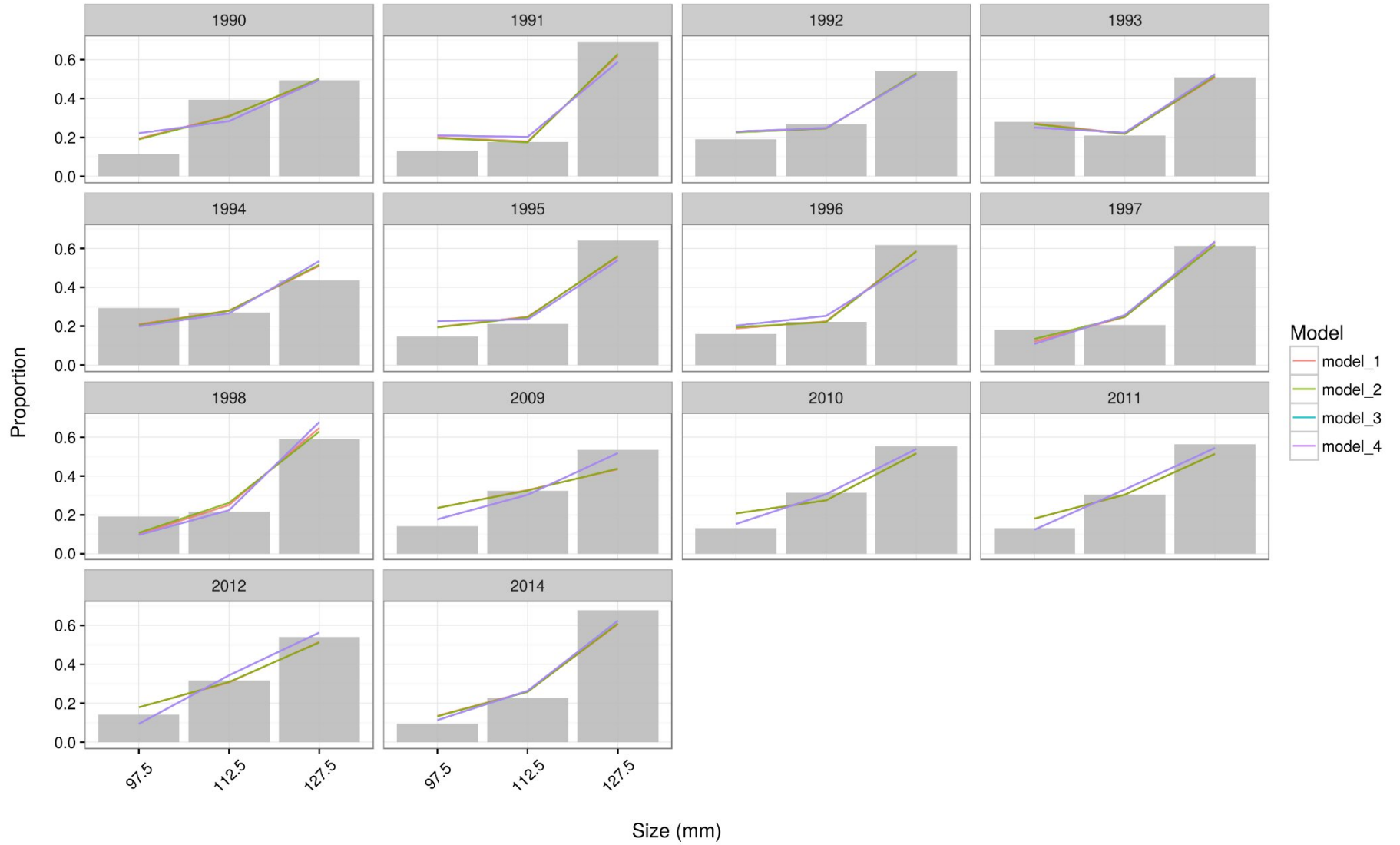


Fit to surveys

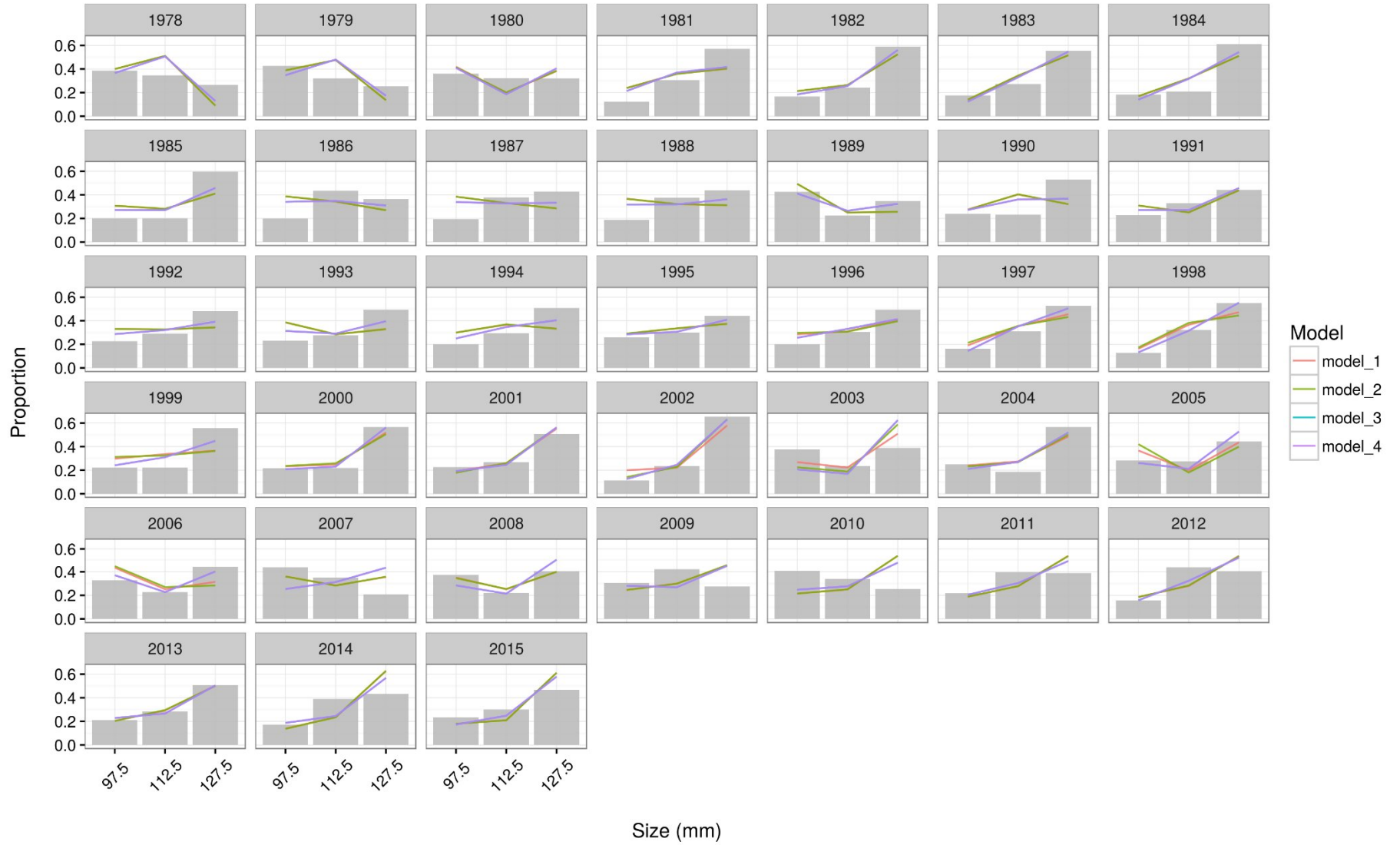




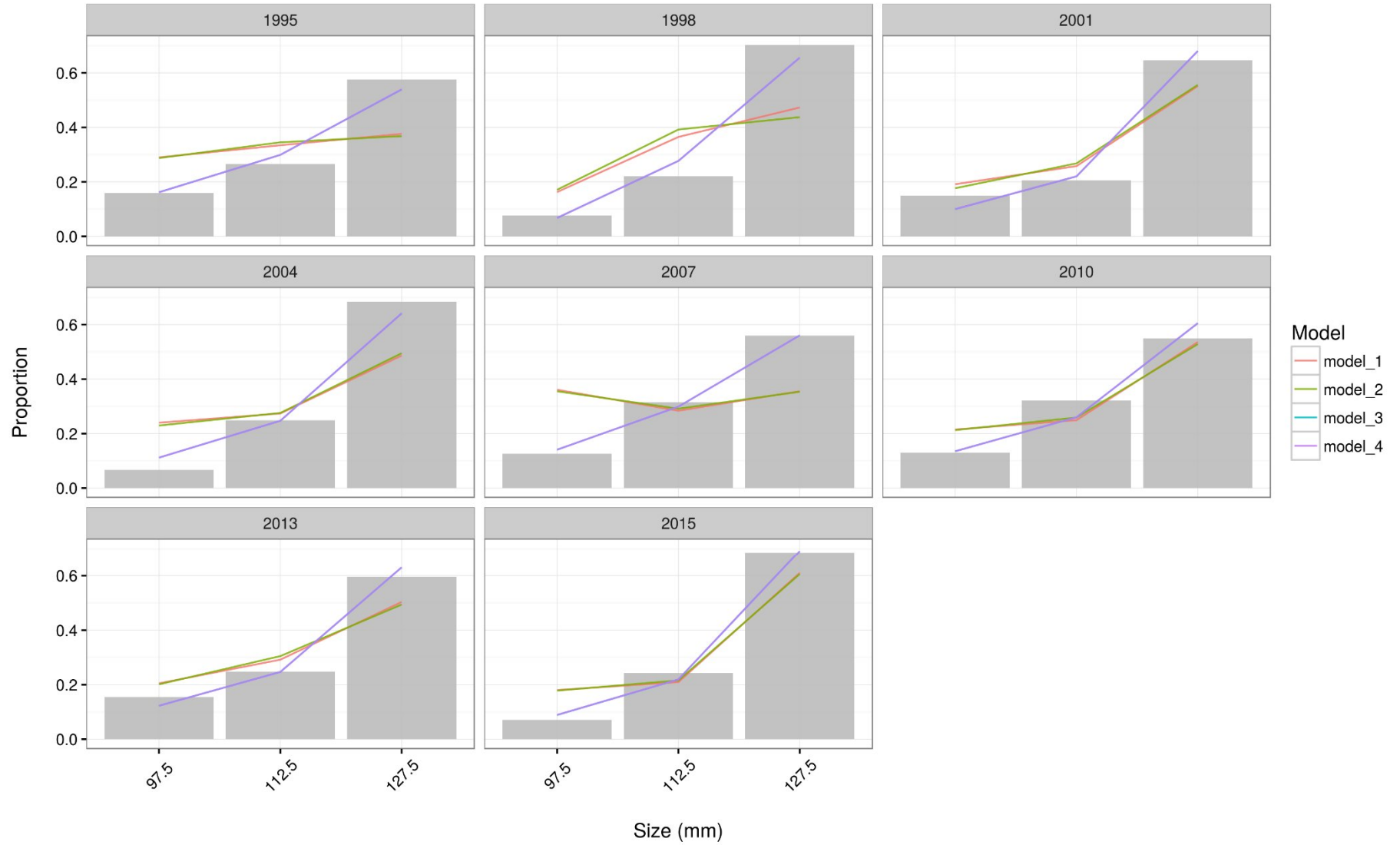
Gear = Pot , Sex = Male

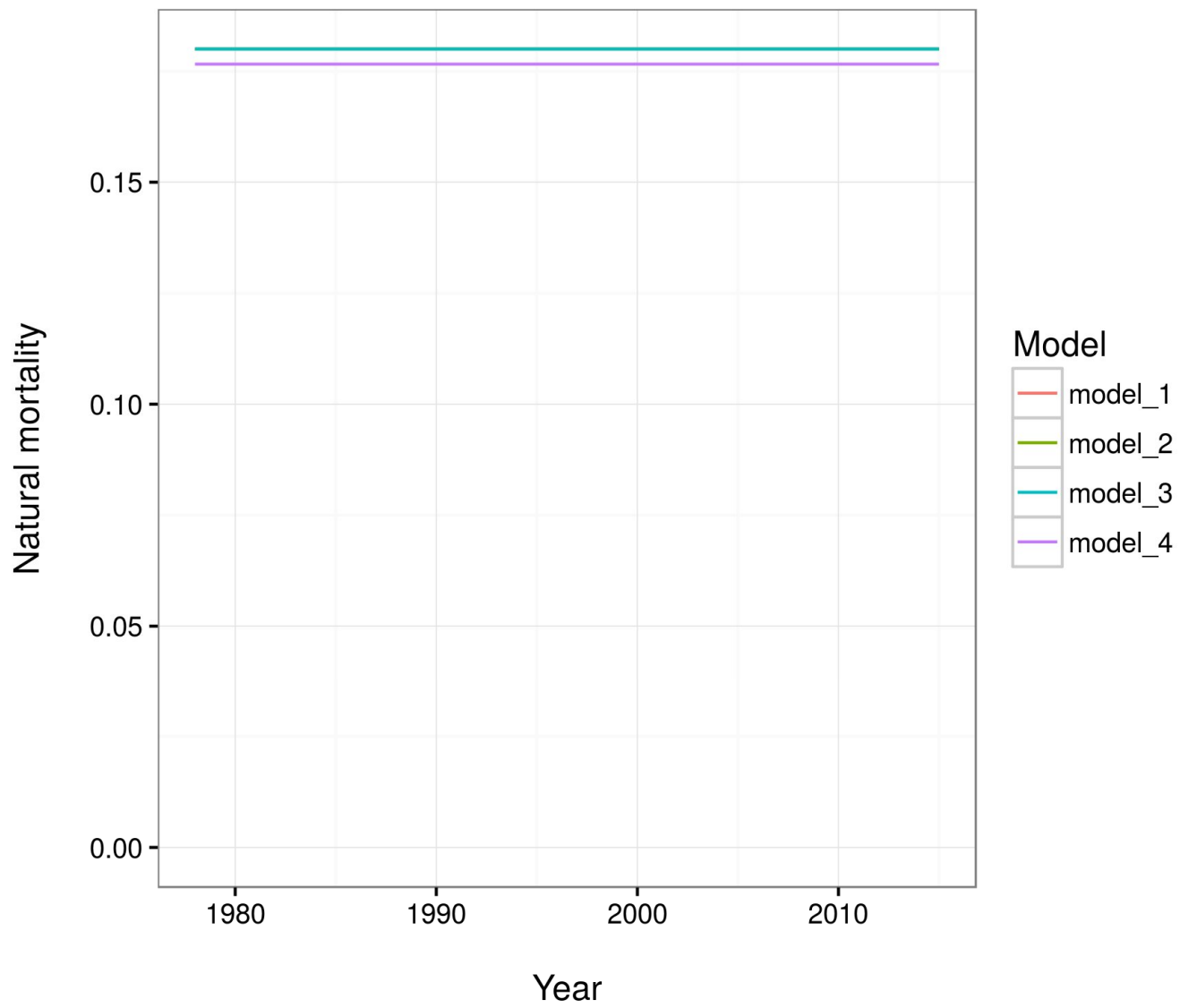


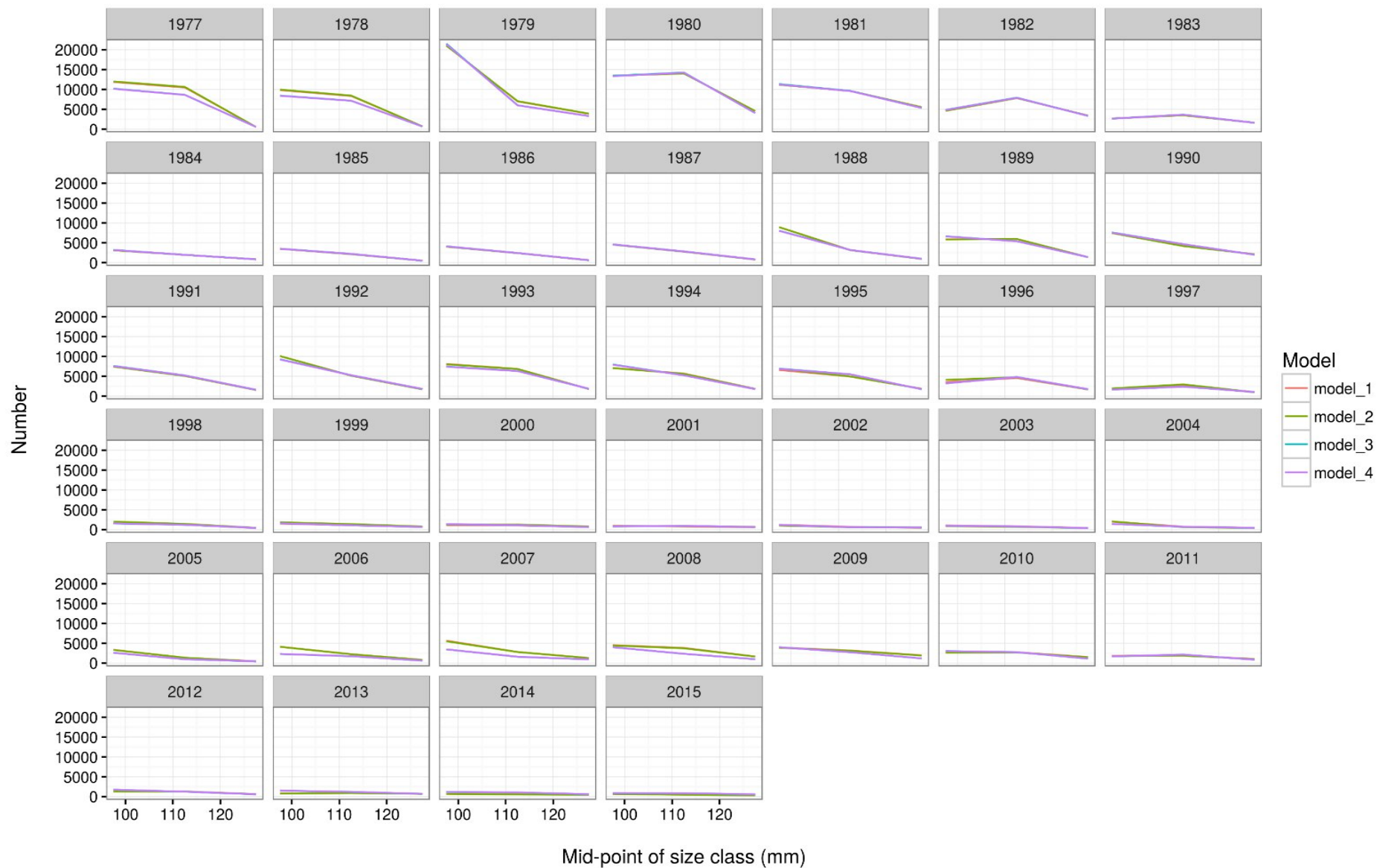
Gear = NMFS Trawl , Sex = Male

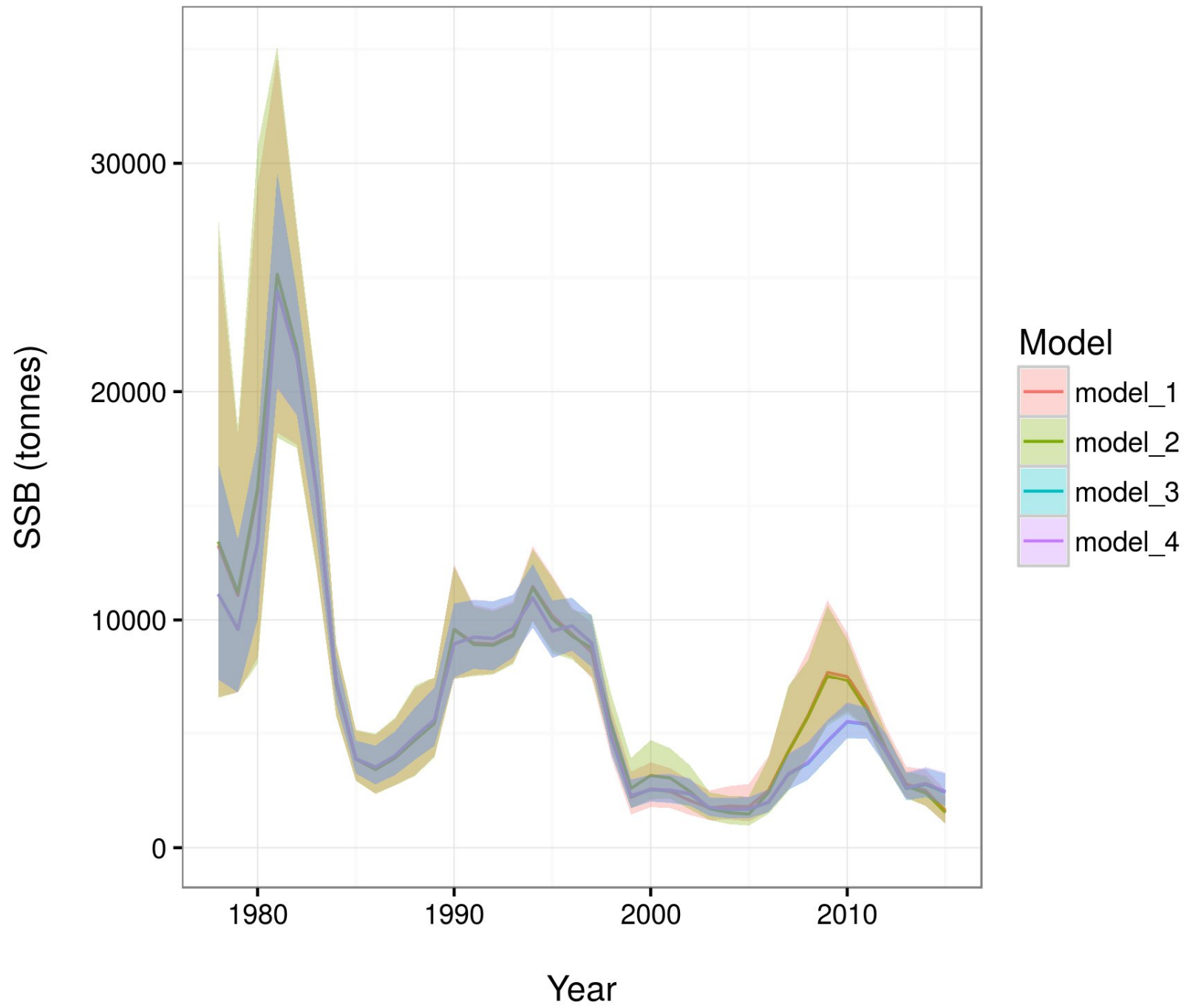


Gear = ADFG Pot , Sex = Male









Summary

- Gmacs SMBKC model seems to be working OK
- Can easily run multiple models and produce plots using automated Makefiles (there are many more plots that I didn't show)
- Are there any other features that are needed in this model and where to next?