

## Evaluating a common Arrowtooth flounder model for the BSAI and GOA

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In November 2013, the Plan Team suggested that the GOA and BSAI arrowtooth flounder models be standardized to have the same features and be interchangeable. Here two changes are presented: 1) modifying the BSAI model to easily incorporate data from either the GOA or the BSAI, and 2) expanding the number of ages in the GOA model from 15 (3-15+) to 1-21, as in the BSAI model.

### BSAI Model compared to generalized version

The current BSAI model (written in ADMB) was modified to allow any number of surveys. Comparing results (with data from the BSAI) shows some minor differences for age 3 recruitment (Figure 1). Selectivity was also similar but with slightly more gradual selectivity estimated for males in the slope survey (Figure 2). Fits to survey data between these two models are virtually identical with log-likelihood values within 2.1% difference between their overall fit (Figure 3).

### GOA Model compared to generalized version

Model results for GOA data are currently being generated.

### GOA Model compared to generalized version with expanded age data

Model results for GOA data are currently being generated.

Results can be compared between the generalized model with 21 ages and the single model with 15 ages. Survey selectivity is similar between the two models. The shape of the fishery selectivity curve is slightly different, but retains the dome shaped form for females (Figure 4). The fit to the survey data is also similar (Figure 5) but not as smooth in the generalized model.

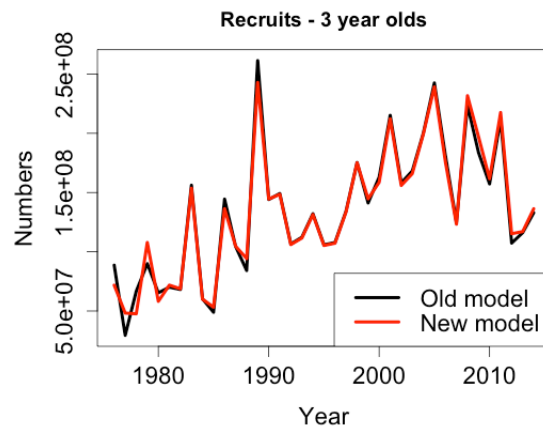


Fig. 1. Recruitment estimates between the new and old model.

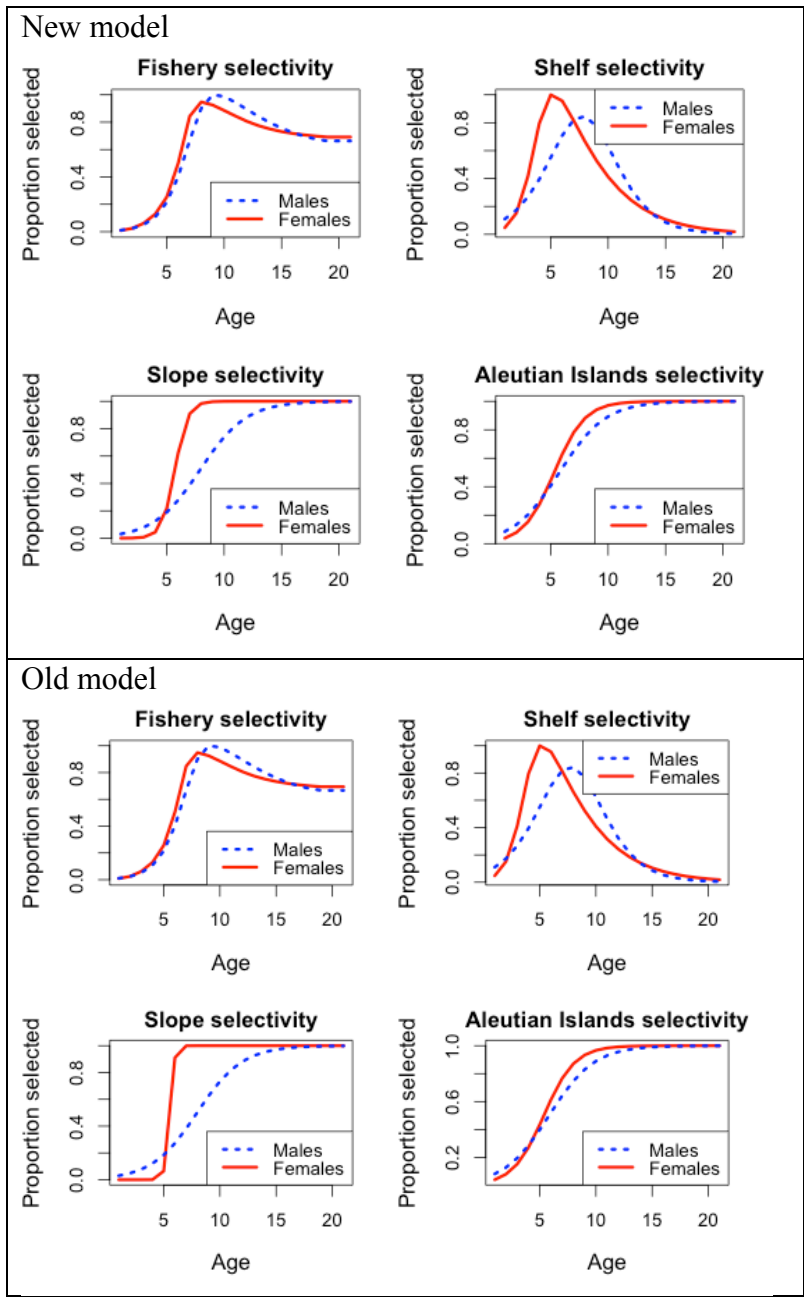


Fig. 2. Selectivity estimates for the new (upper panel) and old (lower panel) models.

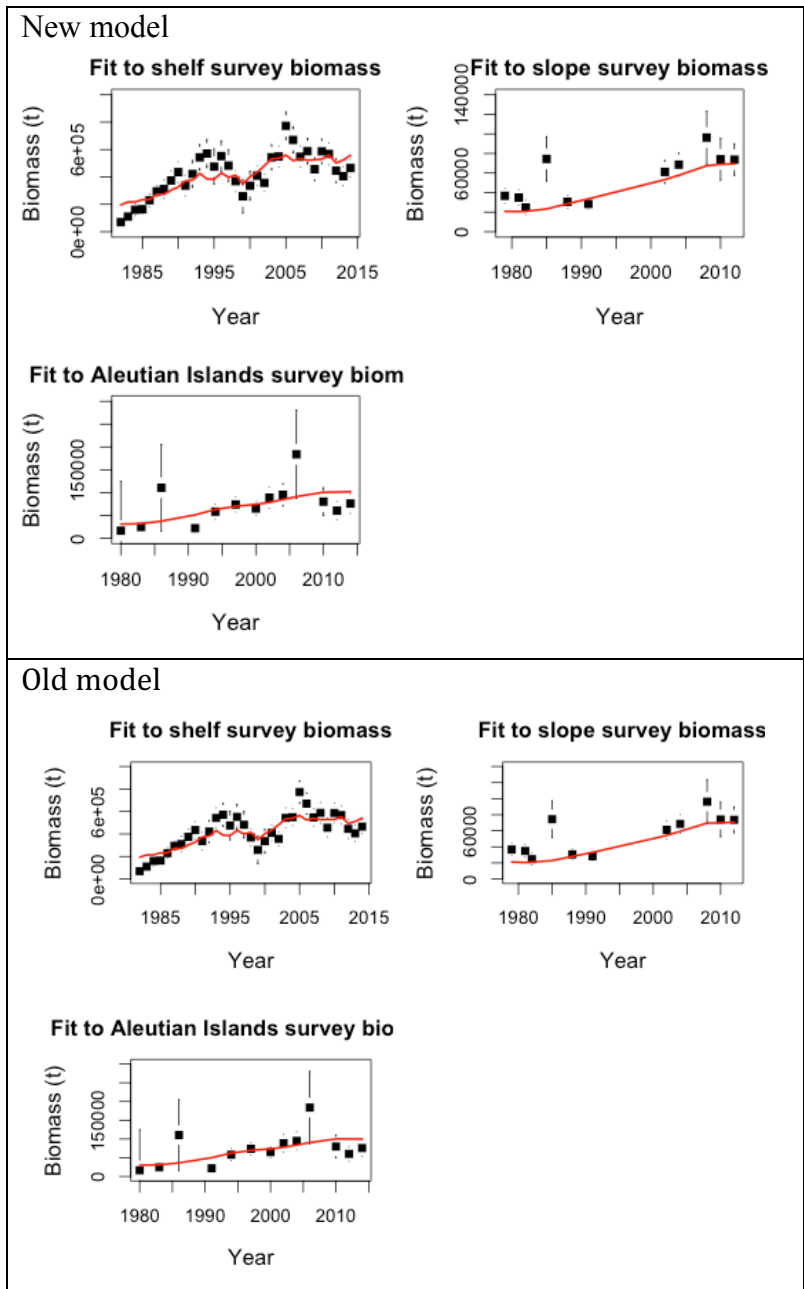


Fig. 3. Fit to survey biomass, new model (upper panel) and old model (lower panel).

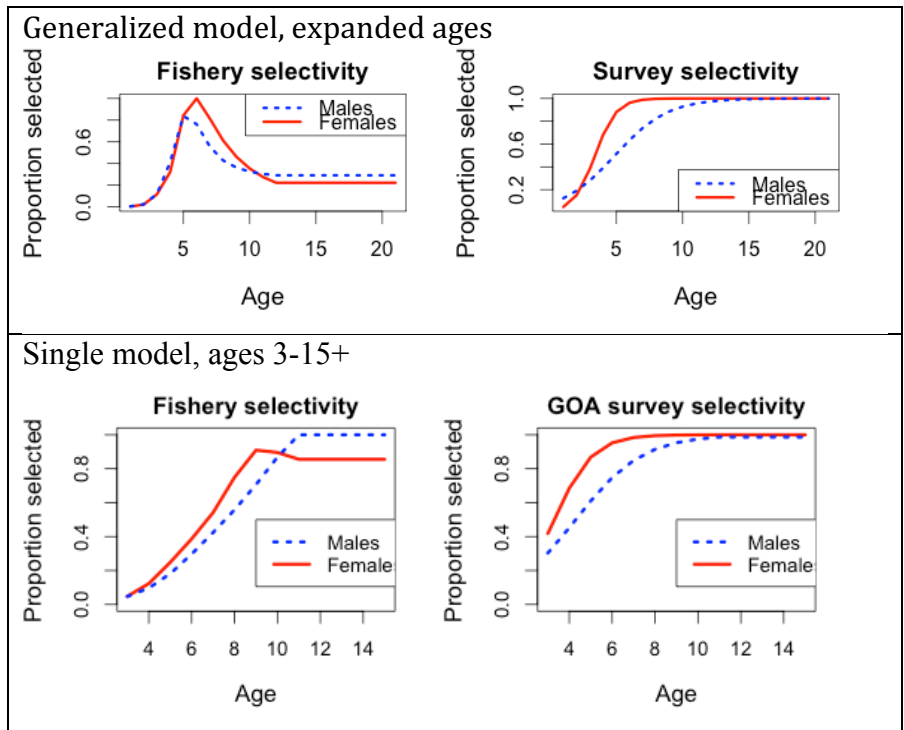


Fig. 4. Estimated fishery and survey selectivity for males and sexes. Selectivity was estimated for 12 ages (ages 1-12) in the generalized model and 9 ages (3-11) in the single model.

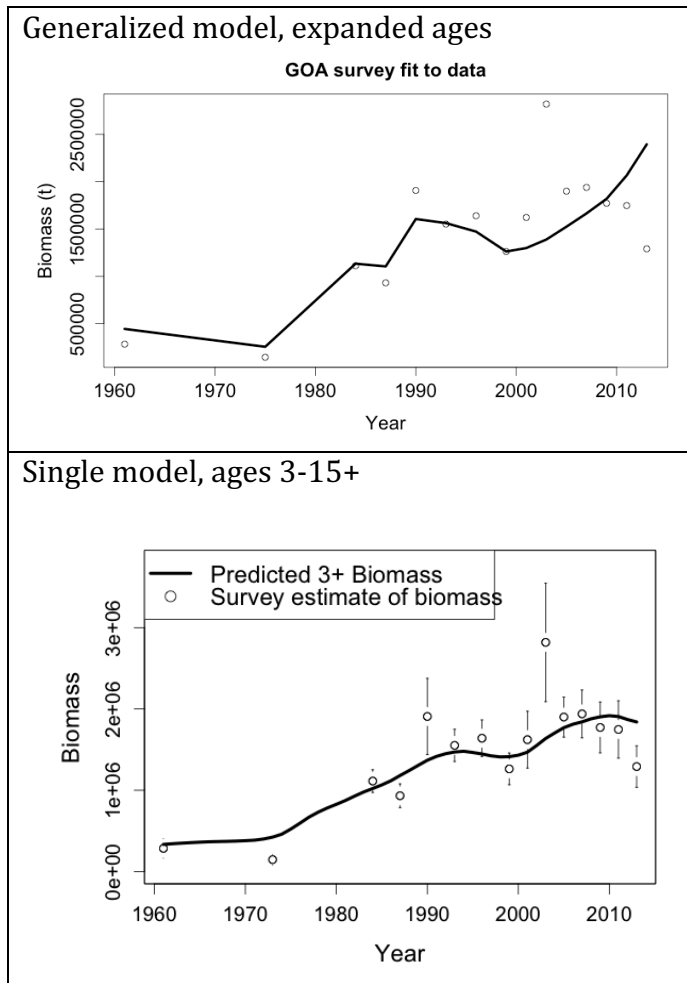


Figure 5. Fit to survey biomass estimates for the generalized model (ages 1 -21, top) and the single model, ages 3-15+ (bottom).