An Age Structured Production Model for Atlantic Cobia

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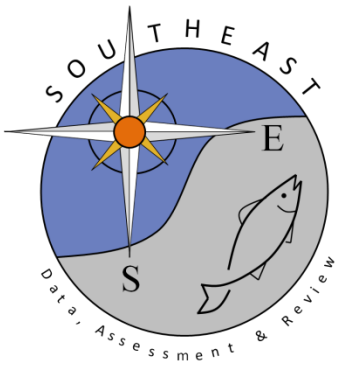

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An age structured production model (ASPM) was run as a simpler model option for the SEDAR 58 Atlantic Cobia assessment. The Assessment Panel did not recommend its use for management, and the model was not considered further. This working paper is meant to document the work done by the group rather than as an alternative model for management.

The age structured production model differs from the model used in the base run in that the recruitment deviations are not estimated. The fits to the headboat index (Figure 1) and the length compositions (Figure 2, first panel) is similar to that of the base run. The fits to the age compositions (Figures 2 and 3) are degraded compared to the base run when the recruitment deviations are not estimated. The estimated selectivities for the commercial and general recreational fleets (Figures 4 and 5) are similar those estimated in the base run. Figures 6 and 7 display the main differences in the results between the BAM ASPM and the base run. The magnitude of the total biomass and the spawning stock biomass are much larger when the variations in the recruitment from year to year are ignored. The Panel acknowledged the stock seems to be driven by recruitment, and a model that ignores the recruitment deviations is not useful for management.

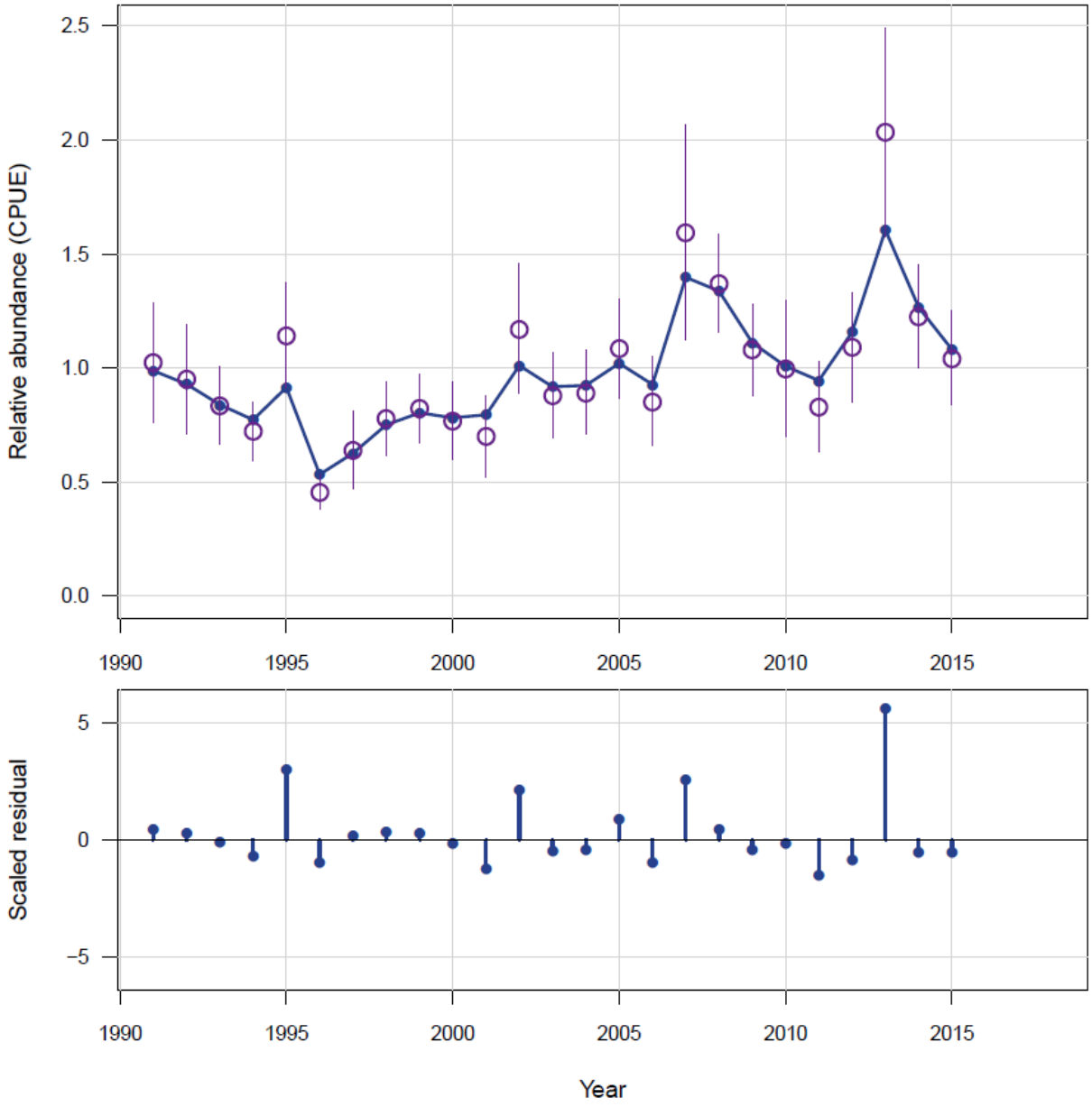

Figure 1. Observed (open circles) and estimated (line, solid circles) index of abundance from the headboat fleet.

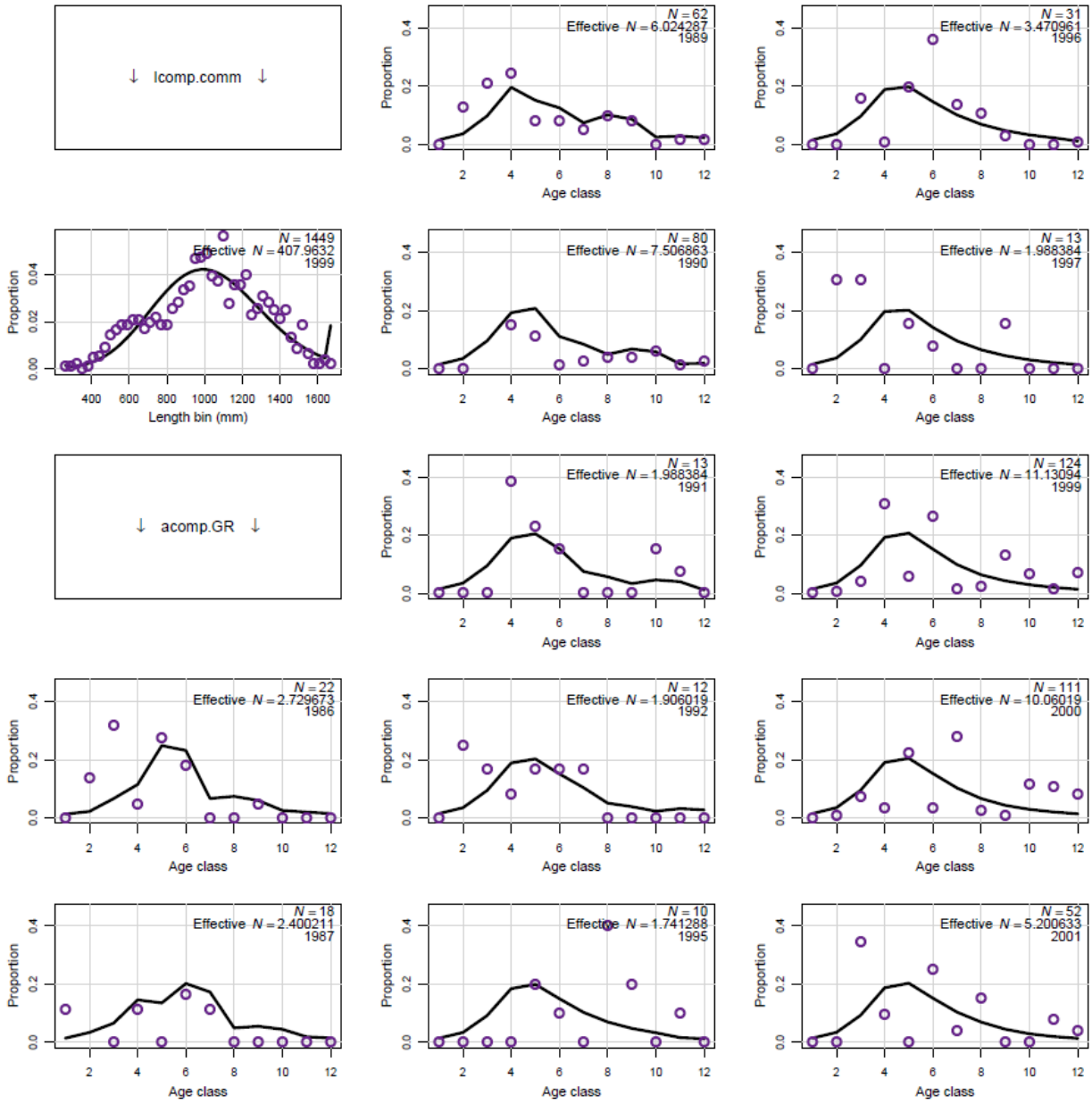

Figure 2. Observed (open circles) and estimated (solid line) annual length and age compositions by fleet from the base run. In panels indicating the data set, lcomp refers to length compositions, acomp to age compositions, comm to the commercial fleet, and GR to the general recreational fleet. N indicates the number of fish samples taken. For the commercial fleet, length compositions from 1986–2017 were pooled.

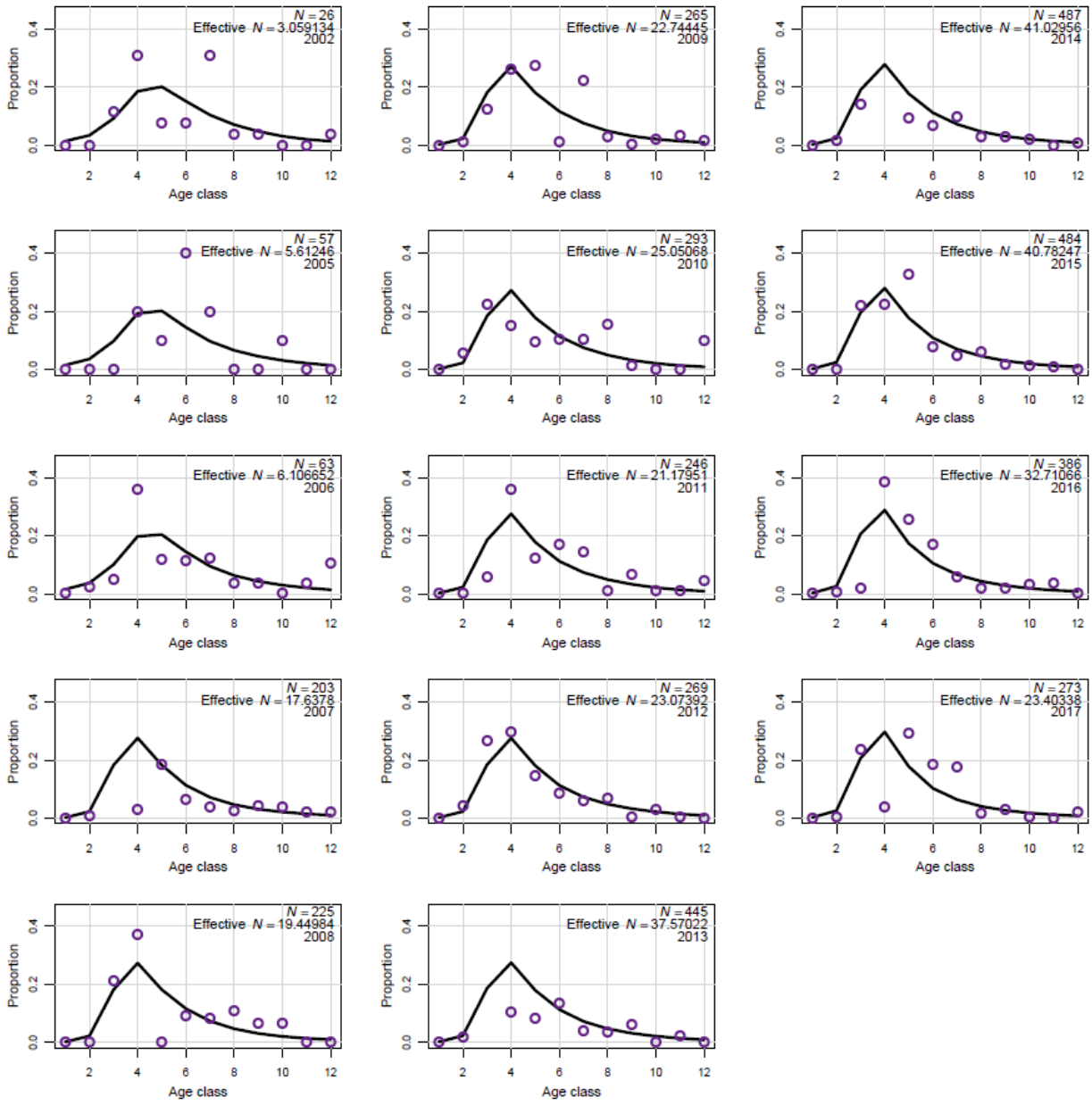

Figure 3. Observed (open circles) and estimated (solid line) annual age compositions by fleet from the base run. In panels indicating the data set, acomp to age compositions, comm to the commercial fleet, and GR to the general recreational fleet. N indicates the number of fish samples taken.

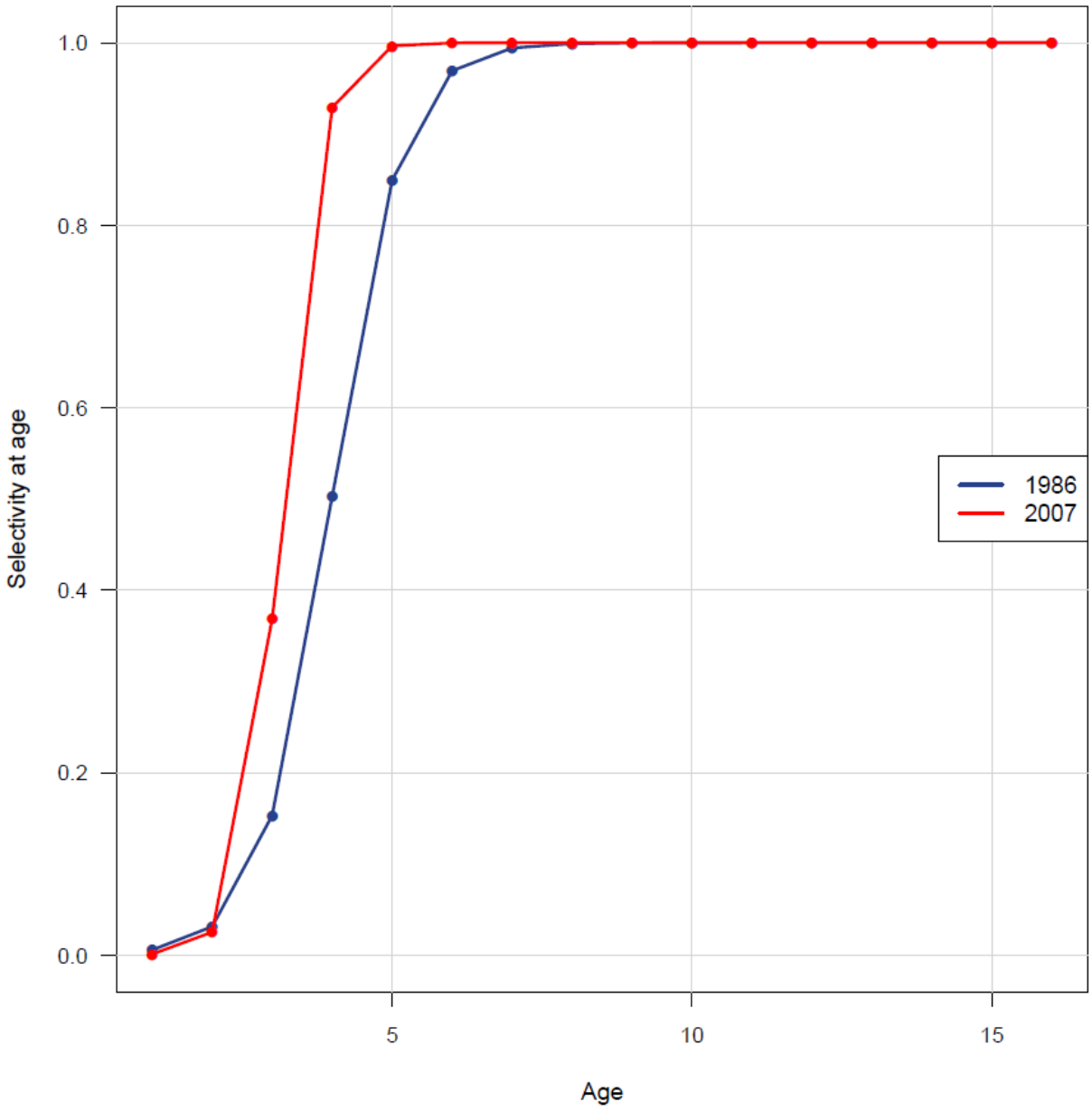

Figure 4. Estimated selectivities of the general recreational fleet. Years indicated on plot signify the first year of a time block

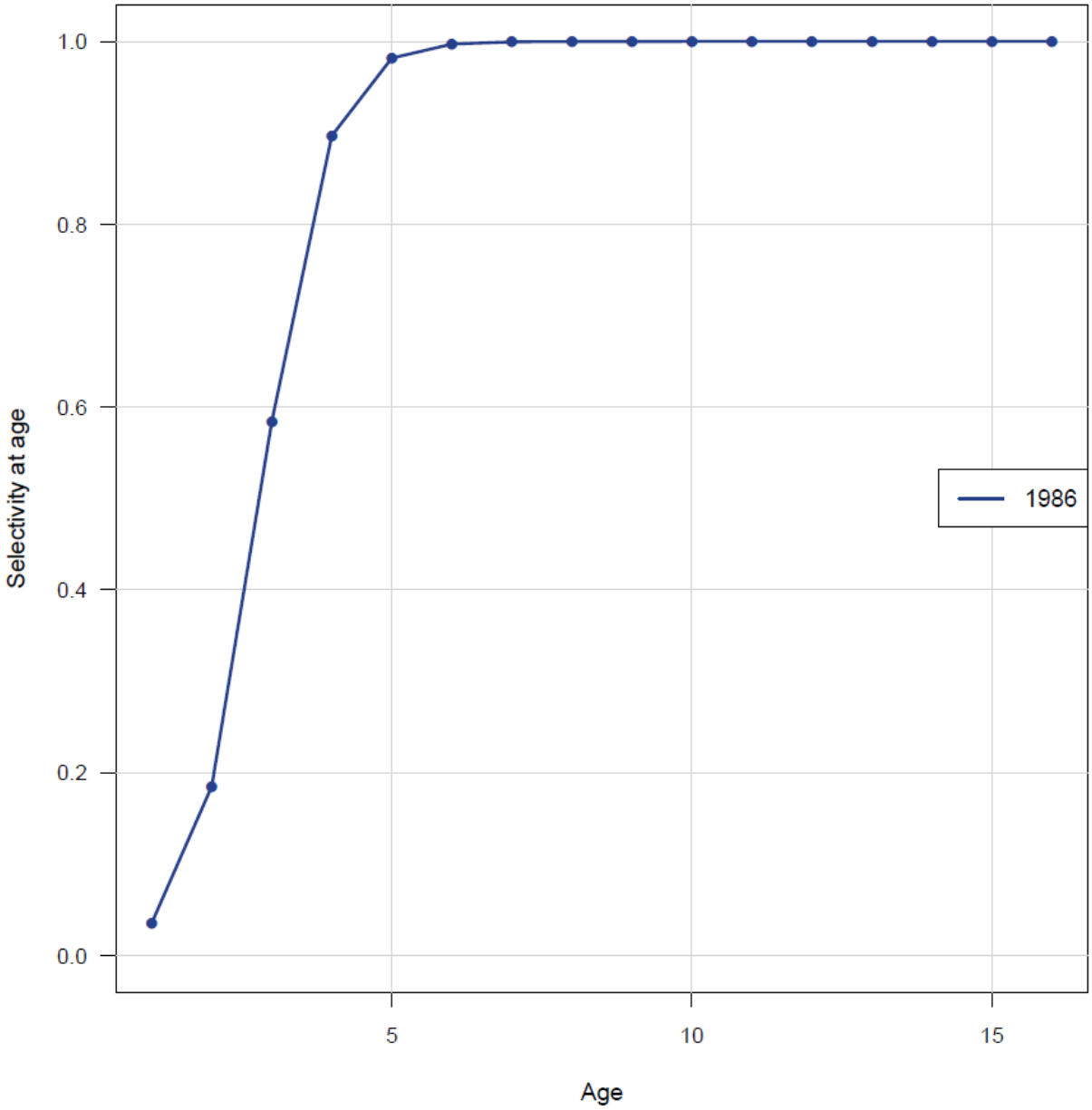

Figure 5. Estimated selectivity of the commercial fleet. Years indicated on plot signify the first year of a time block.

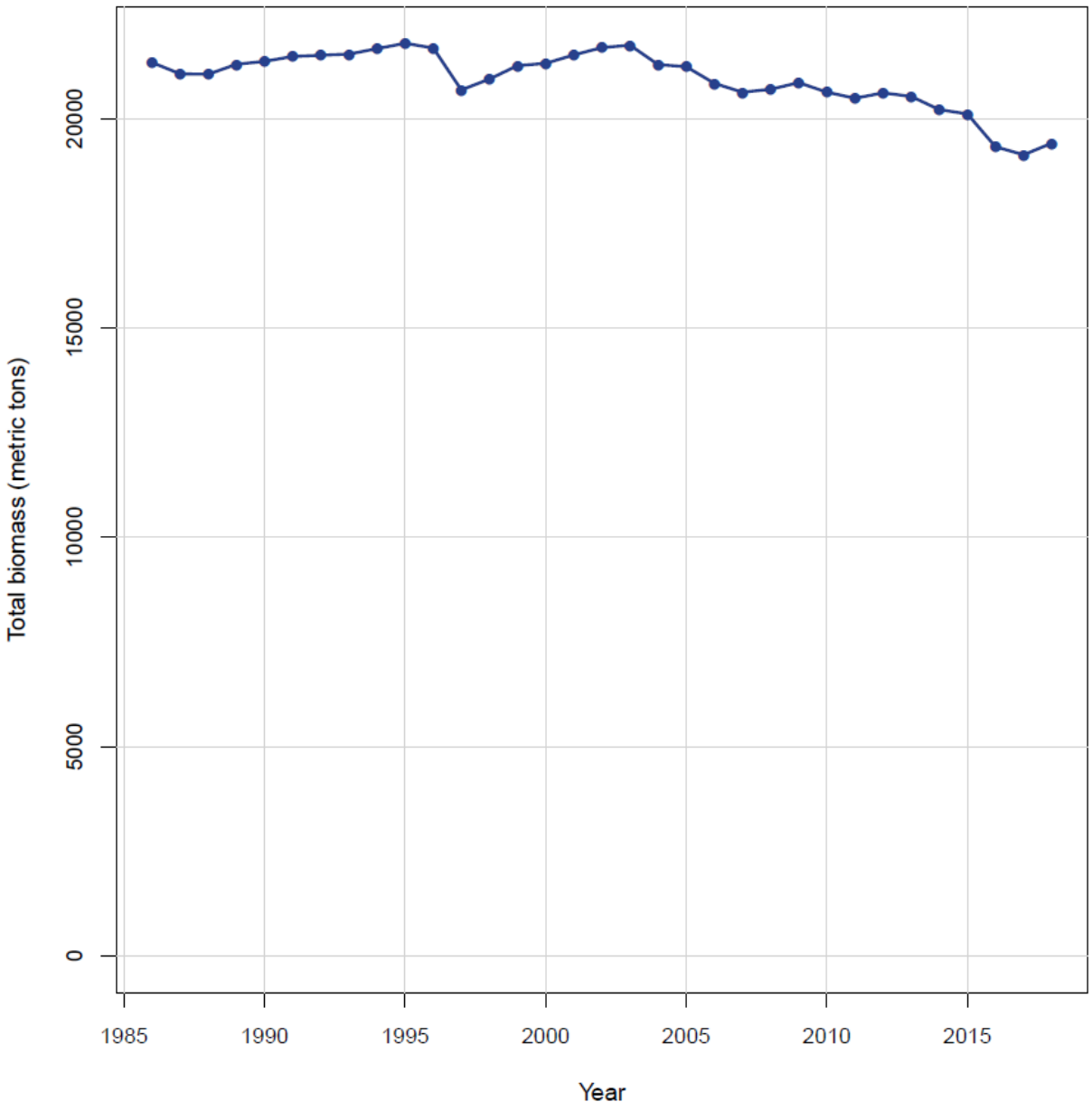

Figure 6. Estimated total biomass (metric tons) at start of year.

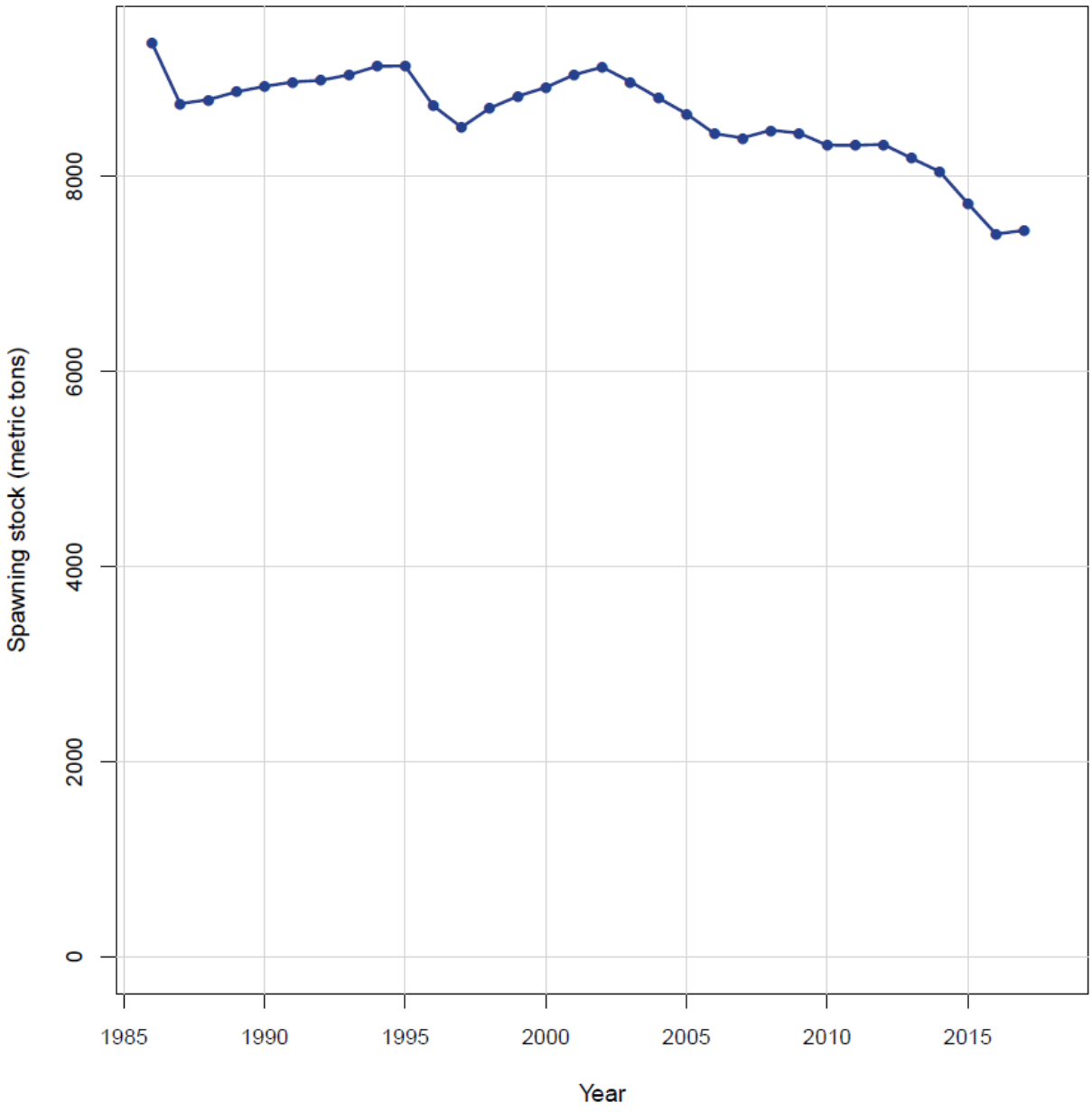

Figure 7. Estimated spawning stock (mature female biomass) at time of peak spawning.

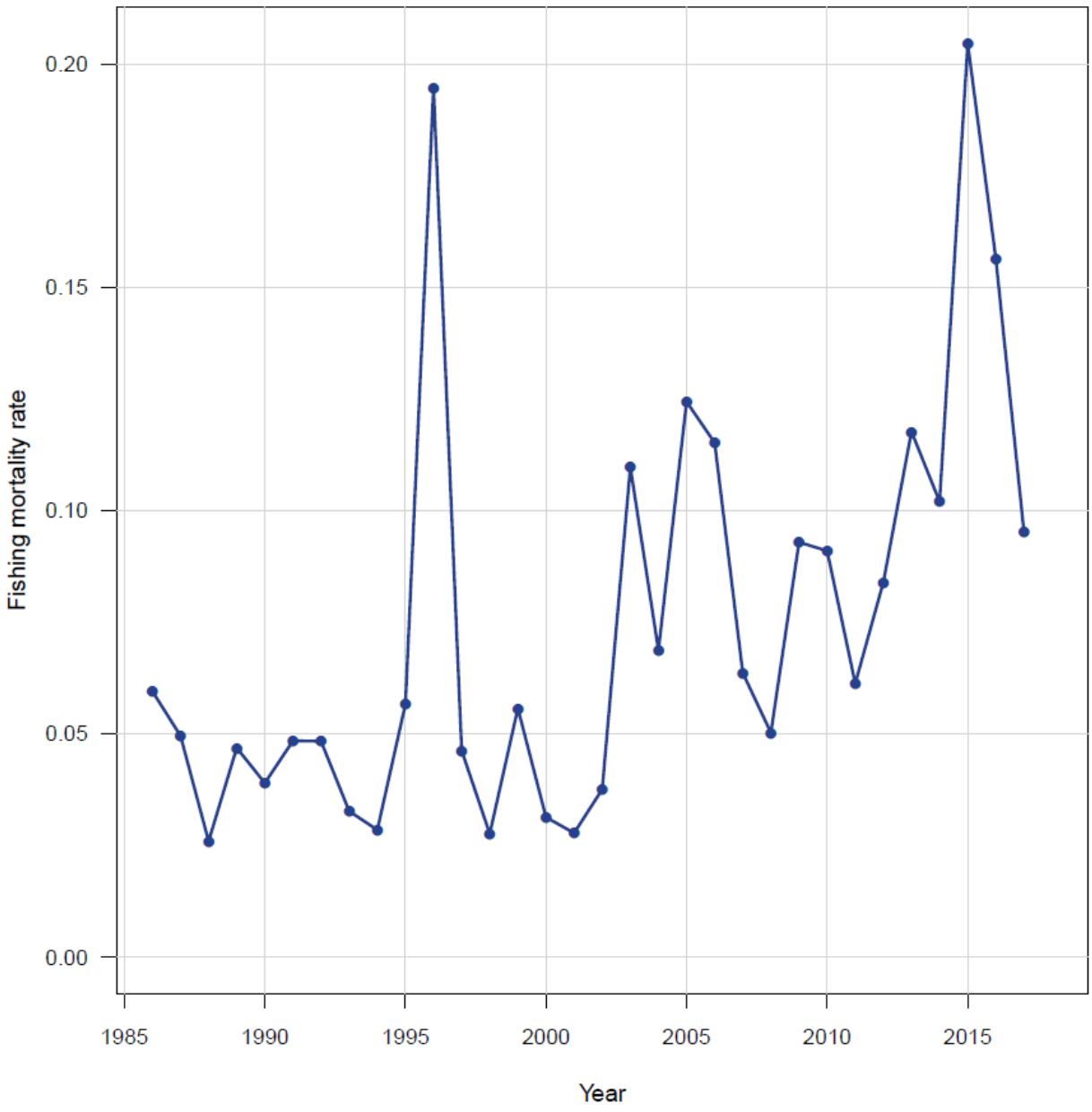

Figure 8. Estimated full fishing mortality.