Calculation of relative length frequencies

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Commercial

Length frequency samples from the TIP database were tallied by year, month, gear, and state. Relative length frequencies (rel-freq$_{g,b,y}$) by gear, 2 cm length bin (TL), and year were calculated by weighting observed length frequencies by the catch in those strata and the effective sample size ($n_{g,y}$) as follows:

$$rel-freq_{g,b,y,p} = \frac{\sum_s \left(Catch_{g,s,y,p} len-freq_{g,s,b,y,p} \right)}{n_{g,y,p} \sum_s Catch_{g,s,y,p}}$$

$$n_{g,y,p} = \sum_b \left\{ \frac{\sum_s \left(Catch_{g,s,y,p} len-freq_{g,s,b,y,p} \right)}{\sum_s Catch_{g,s,y,p}} \right\}$$

where the subscripts are: s=state, g=gear, y=year, b=length bin (in 2 cm intervals), p=period of the year. These calculations were carried out by dividing each year into 3 periods of equal duration. For the commercial fishery, the gear categories were longline in the eastern and western gulf and handline in the eastern and western gulf, with west being defined as the states Texas and Louisiana and east was the states Mississippi, Alabama, and Florida. Initial calculations further subdivided handline in the eastern gulf into shrimp grids 1-7 and grids 8-12, and then these two strata were combined to obtain one handline east gear.

Recreational

Length frequency samples from GulfFIN, Headboat, MRFSS, Texas, Alabama Charter, and TIP were combined by year, month, mode, and state. As above, 2 cm length bins were defined and observed length frequencies and effective sample sizes were calculated for 3 periods per year. In order to match the length frequency samples to the recreational indices used in the assessment (recreational east and recreational west indices), the relative length frequencies and effective sample sizes were summed over mode (shore, headboat, charter, private) for the western gulf (Texas and Louisiana) and eastern gulf (Mississippi, Alabama, and Florida).