

Figure 1. From ADF&G FMS 17.02, Escapement Goal and Run Reconstruction report from 2017, Page 34

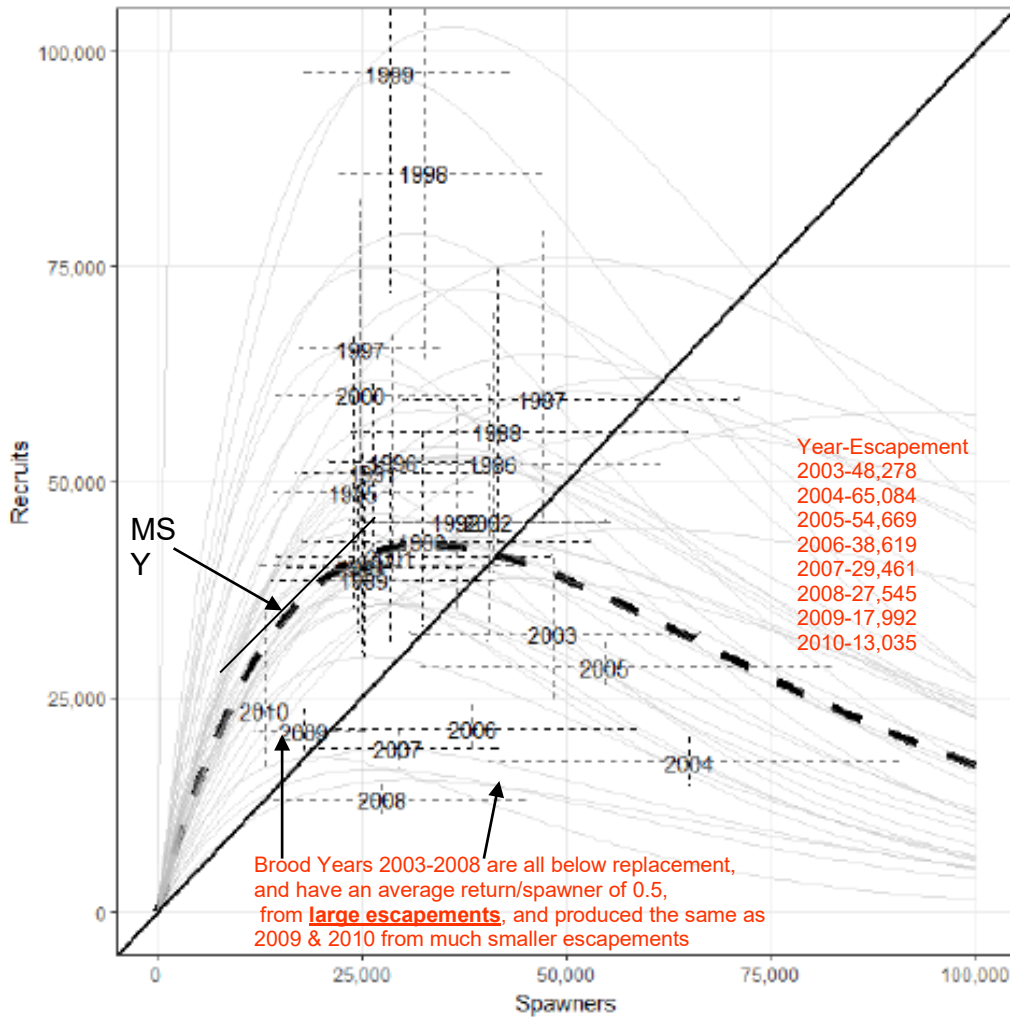


Figure 13.—Plausible spawner-recruit relationships for Kenai River late-run Chinook salmon 75 cm METF and longer, as derived from an age-structured state-space model fitted to abundance, harvest, and age data for 1986–2015.

Note: Posterior medians of R and S are plotted as brood year labels with 90% credibility intervals plotted as light dashed lines. The heavy dashed line is the Ricker relationship constructed from $\ln(\alpha)$ and β posterior medians. Ricker relationships are also plotted (light grey lines) for 40 paired values of $\ln(\alpha)$ and β sampled from the posterior probability distribution, representing plausible Ricker relationships that could have generated the observed data. Recruits replace spawners ($R = S$) on the diagonal line.

Figure 2. From ADF&G FMS 17.02, Escapement Goal and Run Reconstruction report from 2017, Page 37

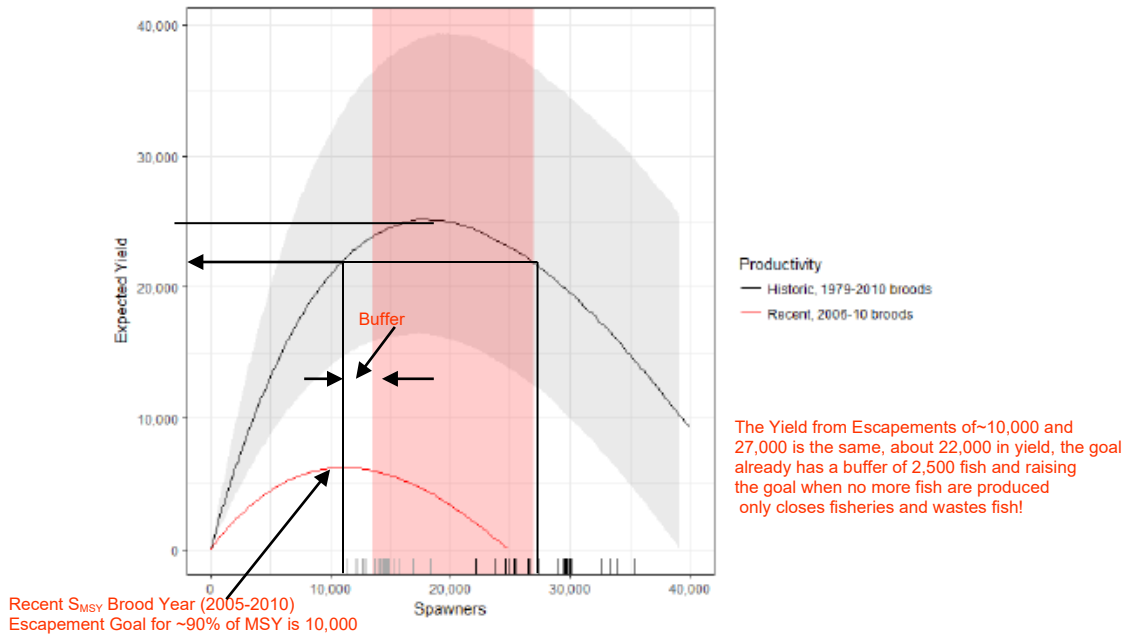


Figure 15.—Expected sustained yield (ESY) plots for Kenai River late-run Chinook salmon 75 cm METF and longer.

Note: ESY median (solid black line) and 50% credibility interval (shaded area around the line) assume average productivity for brood years 1979–2010. Median ESY under recent, reduced productivity (brood years 2006–2010) is also shown (solid red line). The vertical shaded area brackets the recommended goal range; grey and black marks along the x-axis show comparable lower and upper bounds for other Alaskan Chinook salmon stocks scaled by S_{MSY} ratios (see Methods).

DISCUSSION

WHY CHANGE TO SIZE-BASED ESCAPEMENT GOALS?

We propose that inseason management of Kenai River Chinook salmon fisheries be based on direct sonar estimates of Chinook salmon 75 cm METF and longer, primarily because such estimates constitute the most reliable information available. Since 2010, the deployment of imaging sonar (DIDSON and ARIS) in the Kenai River has made it possible to reliably distinguish large Chinook salmon from smaller fish of other species (Miller et al. 2013). ARIS length measurements from Chinook salmon 75 cm METF and longer do not overlap with ARIS measurements from sockeye and other small salmon (Figure 2), and thus these Chinook salmon can be identified and directly assessed by the sonar. Since 2013, when ARIS was first deployed at RM 13.7, it has been possible to count fish traversing nearly the entire cross section of the