

Slikok Creek and waters with existing closures or restrictions. In 2013, ERM spawning radiotagged fish migrated through the lower Kenai River fishery quickly. By mid-July all of the radiotagged Chinook salmon were evenly distributed between waters with existing closures or restrictions and waters without existing restrictions upstream of Slikok Creek.

DISCUSSION

COMPARISON TO HISTORIC DATA

Spawning distributions estimated between 2010 and 2013 are subject to similar biases as historic estimates, but are based on larger sample sizes of radiotagged fish, more frequent radio tracking, and improved radio tag technology. (Tables 1–2 vs. Tables 11–14). While Chinook salmon with a spawning destination in the Killey River drainage were the largest component of the early run in both datasets, the relative contribution of Chinook salmon with a mainstem spawning destination was larger in the 2010–2013 data. In the historic data, Funny River spawners were the second largest contributor to early-run Chinook salmon abundance in 3 of 4 years while Kenai River spawners were the second largest contributor in the other year. In the 2010–2013 data, Kenai River spawners were the second largest contributor to early-run abundance in all years.

While radiotagged Chinook salmon with a mainstem spawning destination were a large component of the last 4 early runs (Table 11), the timing of their post-spawning mortality differed from previous studies. During 1990, the median date for the completion of spawning activity was 19 July for mainstem spawning Chinook salmon that returned during the early run and 15 August for mainstem spawning Chinook salmon that returned during the late run (Bendock and Alexandersdottir 1992; Burger et al. 1983; Johnson and Daigneault 2013). In our study, the median date for the completion of spawning activity was 21 August for mainstem spawning Chinook salmon that returned during the early run and 30 August for mainstem spawning Chinook salmon that returned during the late run. In 2010–2013, some mainstem spawning Chinook salmon did spawn in July, but in low numbers compared to those that spawned in August (Figure 9). Apparently, the spawning events for mainstem spawning Chinook salmon from the early and the late runs were temporally distinct in 1990 (nearly one month apart), but formed an overlapping continuum in 2010–2013.

The difference in median spawning dates for ERM Chinook salmon may be a result of the methods used by each study, and we note that neither study was designed to determine post spawning mortality directly. If our censoring criteria were relaxed, more fish would be assigned spawning destinations within the mainstem of the Kenai River and the post-spawning mortality date of the mainstem spawning Chinook salmon that returned during the early run would be earlier. However, the relative contribution of mainstem spawning Chinook salmon to the early run would also increase, from values that were already above the historic average. We also note that our censoring criteria were based on minimum requirements for successful spawning and were likely conservative in the sense that some migrating fish may have been classified as spawners erroneously. Finally, we note that the 1990 study used a radio tag associated with greater latent tagging effect than those used in the 2010–2013 study (Reimer and Fleischman 2012) and holding and spawning behavior are difficult to distinguish when fish are subject to large tagging effects.

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