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Post-season Stock Composition Analysis of Upper Cook Inlet Sockeye Salmon Harvest, 2005-2007

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Drift Gillnet

We observed a general pattern of increasing proportions of Kenai River and decreasing proportions of Kasilof River sockeye salmon in drift gillnet fishery harvests within season for each of the 3 years (Table 9). However, the estimated percentage of Kenai River sockeye salmon in drift gillnet harvests varied tremendously among years from 22–72% during the first period in July to 41–90% during the last period sampled (Table 9). For each of the 3 years of the study, estimated harvests of Kenai River sockeye salmon peaked during July 11–19. The estimated percentage of Yentna River sockeye salmon varied from 2–15%, with the peak occurring during the first period in July for all years. In 2005 and 2006 the percentage of West Cook Inlet sockeye salmon in the harvest fluctuated from 0–5%, but in 2007 this reporting group accounted for 23% of the harvest at the beginning of the season (June 25–28) before falling back to near 6% two periods later (July 9–12). During all periods, the combined contribution of the Susitna, Knik, and Northeast Cook Inlet reporting groups did not exceed 6%.

Set Gillnet

Tables 9, 11 and 12 and corresponding Figures 13–20 were based on sampling fish in proportion to catch within periods. As such, these estimates are the best estimates of stock-specific catches in the selected periods of the Central District drift, Kasilof Section set, and Kenai Section set gillnet fisheries. The analyses presented in Table 13 were designed to examine differences in the stock composition of catches in the substrata within the Kasilof and Kenai Sections and were not weighed by harvest. Because these estimates are not weighted by harvest, low-harvest periods are treated as equal with periods in which the harvest was much larger. Table 13 does provide insights on spatial patterns of stock-specific harvest within the Kenai and Kasilof Section set gillnet fishery.

Kasilof River fish dominated the harvest in the Kasilof Terminal Area (93–96%) with Kenai River sockeye salmon comprising the remainder (3–7%; Table 10; Figures 15 and 16).

Within the East Side set gillnet fishery, we did not observe a consistent pattern of decreasing abundance of Kasilof River and increasing abundance of Kenai River sockeye salmon (Tables 11 and 12; Figures 17–20). The percent of harvest for Yentna River sockeye salmon in the East Side set gillnet harvests were as follows: 1) Kenai Section on July 16–19, 2005 (3%) and July 21–28, 2007 (13%), and 2) Kasilof Section on June 25–July 5, 2007 (7%) and July 16–21, 2007 (4%). The 90% credibility intervals for these estimates did not include zero.

Further examination of stock compositions in four statistical substrata within the East Side set net fishery were performed on mixtures ranging in size from 189 to 1,335 fish. These mixtures revealed that Yentna River sockeye salmon were primarily harvested in the Cohoe/Ninilchik and North/South Salamatof substrata (Table 13; Figures 21 and 22).

DISCUSSION

This report reviews an initiative to expand and improve on earlier ADF&G studies to estimate the stock composition of sockeye salmon in Upper Cook Inlet. ADF&G focused on research to improve the techniques of GSI as applied to Cook Inlet sockeye salmon. These efforts addressed three areas: 1) development and evaluation of genetic markers for improved resolution, 2) development of statistical techniques for more accurate and precise estimation of stock composition, and 3) development of the infrastructure to support high-throughput and low-error genotyping.