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Hook-and-Release Mortality in the Kenai River Chinook Salmon Recreational Fishery

by

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Table 4. Distribution of fates by run and sex for Kenai River chinook salmon, 1990.

	Females		Males		Total	
	Number	Percent	Number	Percent	Number	Percent
Early Run						
Five-day Fates:						
Harvest	1.00	0.80	.	.	1.00	0.80
Mortality	6.00	4.80	5.00	4.00	11.00	8.80
Survivors	49.00	39.20	63.00	50.40	112.00	89.60
Tag net	.	.	1.00	0.80	1.00	0.80
Total	56.00	44.80	69.00	55.20	125.00	100.00
Ultimate Fates:						
Dropouts	1.00	0.80	2.00	1.60	3.00	2.40
Harvest	6.00	4.80	3.00	2.40	9.00	7.20
Mortality	9.00	7.20	6.00	4.80	15.00	12.00
Spawner	39.00	31.20	55.00	44.00	94.00	75.20
Tag net	.	.	2.00	1.60	2.00	1.60
Uplost	1.00	0.80	1.00	0.80	2.00	1.60
Total	56.00	44.80	69.00	55.20	125.00	100.00
Late Run						
Five-day Fates						
Dropout	.	.	2.00	1.67	2.00	1.67
Harvest	1.00	0.83	2.00	1.67	3.00	2.50
Mortality	1.00	0.83	6.00	5.00	7.00	5.83
Survivor	28.00	23.33	78.00	65.00	106.00	88.33
Set net	.	.	1.00	0.83	1.00	0.83
Tag net	.	.	1.00	0.83	1.00	0.83
Total	30.00	25.00	90.00	75.00	120.00	100.00
Ultimate Fates:						
Dropout	1.00	0.83	9.00	7.50	10.00	8.33
Harvest	3.00	2.50	9.00	7.50	12.00	10.00
Mortality	1.00	0.83	6.00	5.00	7.00	5.83
Set net	.	.	6.00	5.00	6.00	5.00
Spawner	22.00	18.33	49.00	40.83	71.00	59.17
Tag net	1.00	0.83	6.00	5.00	7.00	5.83
Uplost	2.00	1.67	5.00	4.17	7.00	5.83
Total	30.00	25.00	90.00	75.00	120.00	100.00

10.4% NON Spawners

24.8% NON Spawners

11.67% NON Spawners

40.83 — NON Spawners

1 5-day 10-12% non-spawners

2 ultimate 25-40 NON Spawners

3 Spawners — Actually Spawn? Egg retention only appear to spawn

Early Run:

Early-run spawners distributed to both tributary (72%) and mainstem (28%) final destinations (Figure 13). Destinations were independent of weekly entry times for early-run fish (χ^2 = 12.932, df = 9, p > 0.10). The Killey (42%) and Funny rivers (20%) were the most extensively used tributary destinations, while the middle section (11%) was the most extensively used mainstem river reach. Completion of early-run spawning activity, evidenced by consecutive mortality signals or downstream movement from maximum upper locations, occurred from 23 June through 22 August with peak spawning in mid-July. Median spawning dates were 13, 18, and 19 July for Funny River, Killey River, and mainstem spawners, respectively.

Late Run:

Mainstem destinations were selected for spawning by 69 (97%) out of 71 tagged fish. The remaining two fish (3%) spawned in Benjamin and Juneau creeks. Thirty-three fish (46%) spawned in the lower mainstem river reach, followed by 22 (31%) in the middle reach, 9 (13%) in the upper reach, and 5 (7%) in the interlake reach (Figure 13). Distributions of spawners among the four mainstem river reach classifications were independent of weekly entry times (χ^2 = 12.932, df = 9, p < 0.10). Completion of late-run spawning activity, evidenced by consecutive mortality signals or downstream movement from maximum upper locations, occurred from 23 July through 10 September with a median spawning date of 15 August.

Stream Life of Tagged Fish:

The duration of time between tagging and death (stream life) was calculated for 165 fish that were judged to have spawned (Table 12). Mean stream life was 32 days (SE = 0.837) and ranged from 8 to 67 days. Stream life for tributary spawners (mean = 33.7 days, SE = 1.391) and mainstem spawners (mean = 30.3 days, SE = 1.076) was not significantly different.

Tagged fish that migrated to small tributaries spent a larger proportion of their stream life in the mainstem than fish utilizing the Funny and Killey rivers (χ^2 = 5.526, df = 2, 0.05 < p <0.010). Tagged fish utilizing small tributaries expended 79% of their stream life in the mainstem, while Killey and Funny River fish expended 54% and 55%, respectively.

DISCUSSION

Hook-and-Release Mortality

Hook-and-release mortality was found to be significantly smaller than the tolerance level of 20% established at the outset of this study. The hook-and-release mortality estimated in this study should be considered an overestimate, as the effect of additional handling during the tagging cannot be subtracted. For the three experiments, the survival after 5 days was estimated at 89.4%, 91.2%, and 94.1% for the late 1989 run, the early 1990, and the late 1990 runs. The 95% confidence intervals for these three estimates were well above the 80% tolerance level that we had established