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Inseason Total Run Tracking

Table 1.- Cumulative harvest and passage estimates of sockeye salmon in Upper Cook Inlet (UCI), 2024. All personal use and sport harvest estimates are projections based on recent five-year average harvest rates within each fishery. The Susitna River escapement estimate uses the average harvest rate of this stock in UCI commercial salmon fisheries (42%; 2007 to 2015), the average run timing, and pre-season forecasts. The Crescent River escapement estimate is based on the average commercial sockeye salmon harvest in the western district and average harvest rate of this stock (46.3%) from 2006 to 2021.

Run component	Fishery	Cumulative season total
Commercial Harvest	Central District Drift - State Waters	464,376
	Kasilof Section Set Net Fishery	1,008
	Kenai Section Set Net Fishery	4,088
	Northern District Set Net Fishery - Eastern Subdistrict	6,881
	Northern District Set Net Fishery - General Subdistrict	3,718
	UCI EEZ	255,055
	Western Subdistrict Set Net Fishery	38,826
	Subtotal	773,952
Escapement	Crescent Escapement	24,699
	Fish Creek Escapement	12,007
	Kasilof River Escapement	586,840
	Kenai River Escapement	596,845
	Susitna Escapement	27,684
	Other	187,211

Run component	Fishery	Cumulative season total
	Subtotal	1,435,286
Personal Use and Sport	Kasilof Personal Use Dipnet	110,957
	Kasilof Personal Use Gillnet	35,266
	Kasilof Sport	42,005
	Kenai Personal Use Dipnet	127,897
	Kenai Sport	87,123
	Subtotal	403,247
Grand Total		2,612,485

Age Allocation Modeling

A weighted age composition method was used to estimate the contributions of Kenai, Kasilof, Susitna, and Crescent rivers, Fish Creek, and“Other” sockeye salmon stocks to commercial fishery harvests in UCI (see Bernard 1983 and Tobias and Tarbox 1999 for general methods). The method is based on the assumption that specific fisheries exploit each stock equally. The relative contribution of a specific age class in the escapement represents the relative contribution of that age class in the commercial harvest in a specific time and area fished. Sockeye salmon harvests in the various fishery subdistricts were allocated to the stocks entering major rivers that were in closest proximity to the fishery.

Table 2.- Cumulative total run estimates to date for primary Upper Cook Inlet sockeye salmon stocks.

Stock	Run component	Total
Crescent	Commercial Harvest	5,107
	Escapement	24,748
	Subtotal	29,855
Fish Creek	Commercial Harvest	5,779
	Escapement	12,007
	Subtotal	17,786
Kasilof	Commercial Harvest	273,239
	Escapement	581,950
	Personal Use and Sport	186,659
	Subtotal	1,041,848
Kenai	Commercial Harvest	342,259
	Escapement	596,845
	Personal Use and Sport	215,020
	Subtotal	1,154,124

Stock	Run component	Total
Other	Commercial Harvest	116,663
	Escapement	187,211
	Subtotal	303,874
Susitna	Commercial Harvest	14,776
	Escapement	27,684
	Subtotal	42,460

Table 3.- Age composition of returns to the Kenai and Kasilof Rivers in 2024 relative to preseason forecasts.

Stock	Age class	Composition of return	Run to date	Forecasted run	Percent remaining	Total fish remaining
Kasilof	0.2	0.0%	0	0	0.0%	0
	0.3	0.0%	0	0	0.0%	0
	1.2	41.0%	431,726	506,000	15.0%	74,274
	1.3	59.0%	610,122	332,218	-84.0%	0
	1.4	0.0%	0	0	0.0%	0
	2.1	0.0%	0	0	0.0%	0
	2.2	0.0%	0	221,924	100.0%	221,924
	2.3	0.0%	0	55,019	100.0%	55,019
	2.4	0.0%	0	0	0.0%	0
Kenai	0.2	0.0%	0	0	0.0%	0
	0.3	0.0%	0	0	0.0%	0
	1.2	21.0%	240,807	515,248	53.0%	274,441
	1.3	74.0%	857,900	2,143,928	60.0%	1,286,028
	1.4	0.0%	0	0	0.0%	0
	2.1	0.0%	0	0	0.0%	0
	2.2	0.0%	0	248,800	100.0%	248,800
	2.3	5.0%	55,417	472,484	88.0%	417,067
	2.4	0.0%	0	0	0.0%	0

Total Run Projections

An inseason tier-status assessment is annually performed for late-run stock Kenai River sockeye salmon (See Table 4). Historically, the tier status assessment had relied on cumulative catch-per-unit-effort timing curves from the offshore test fish project (OTF) to project the total run to the Kenai River. This method provided unbiased estimates of run timing because performance of this fishery is largely independent of management actions. In 2024, the OTF project was cut due to budget issues which required other methods to be explored for the inseason projection. Inriver run timing curves were assessed using historical total run data and were found to provide reliable total run projection estimates within the scope of run tier designations.

Stock-specific inriver run timing models spanning years 2000 to 2023 were evaluated to project the total run of sockeye salmon to the Kenai and Kasilof Rivers. Projection model performance was assessed using the mean arctangent absolute percent error (MAAPE) between the projected daily total run estimates and actual runs up to the date the projection was run. The top three models with the lowest MAAPE were selected for each stock and a weighted hybrid model approach was applied. Model weighted were assigned based on the running MAAPE of each selected model, with a lower MAAPE receiving a greater weight towards the final projection estimate.

Table 4.- Management tiers for the late-run stock Kenai River sockeye salmon.

Tier	Total Run Size
Lower	Less than 2,300,000
Middle	2,300,000 to 4,600,000
Upper	Greater than 4,600,000

Table 5.- Total run projections by stock.

Stock	Year	Timing	MAAPE	Model Projection	Model Weight	Weighted projection	Total
Kasilof	2023	41.2%	9.45	2,527,256	0.38	957,277.1	**2,468,057**
	2022	35.3%	10.43	2,951,307	0.34	1,013,282.4	
	2009	58.2%	12.88	1,790,297	0.28	497,497.2	
Kenai	2009	35.8%	27.52	3,220,127	0.36	1,143,777.7	**3,566,350**
	2003	36.3%	29.85	3,180,841	0.33	1,041,464.7	
	2010	26.5%	30.79	4,351,514	0.32	1,381,108.0	

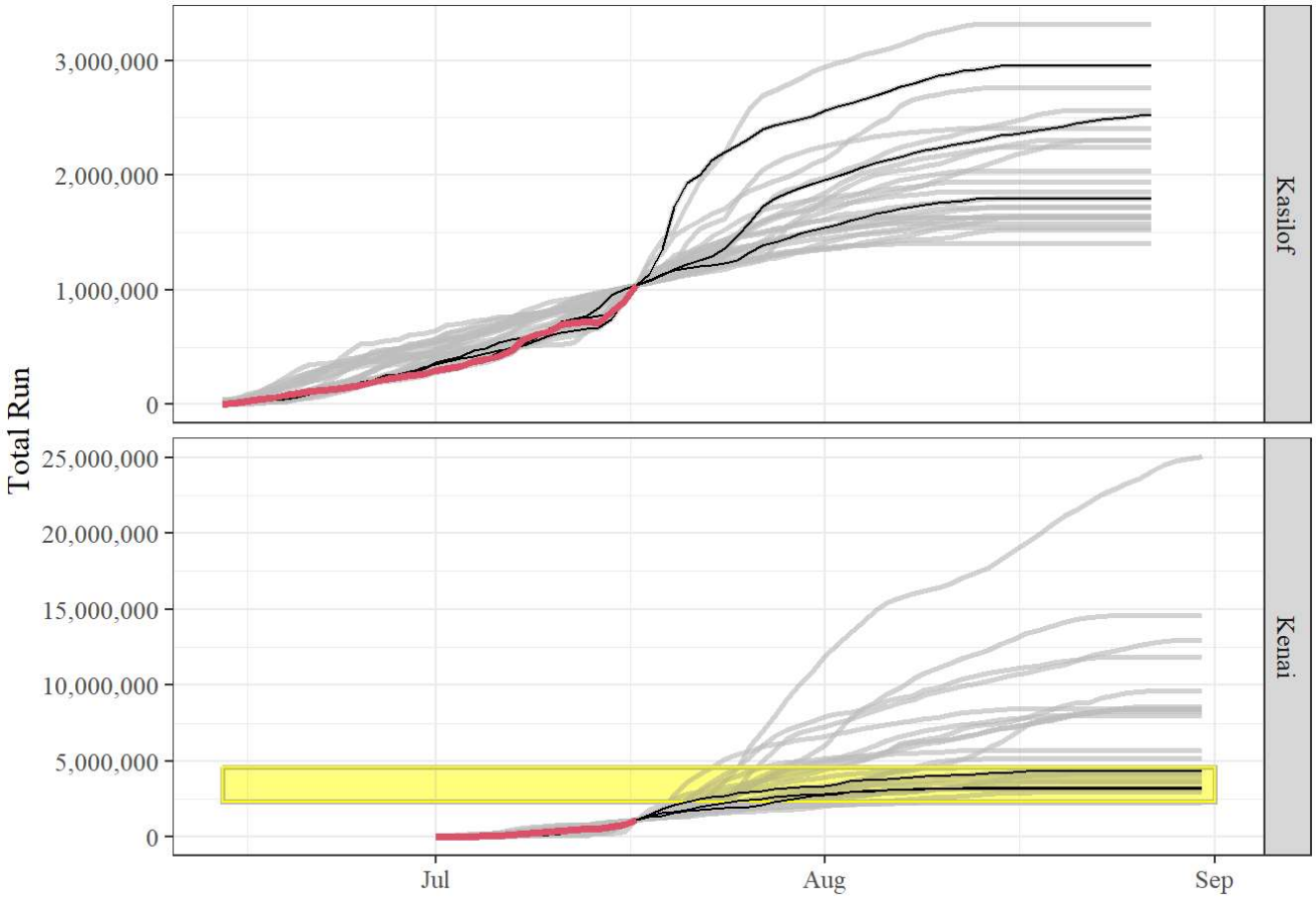

Figure 1.- The top three competing models for each stock (black lines) relative to actual daily cumulative total runs (red line). All other competing models are indicated in grey. The middle management tier (2.3 to 4.6 million fish) for late-run stock Kenai River sockeye salmon is indicated in yellow.

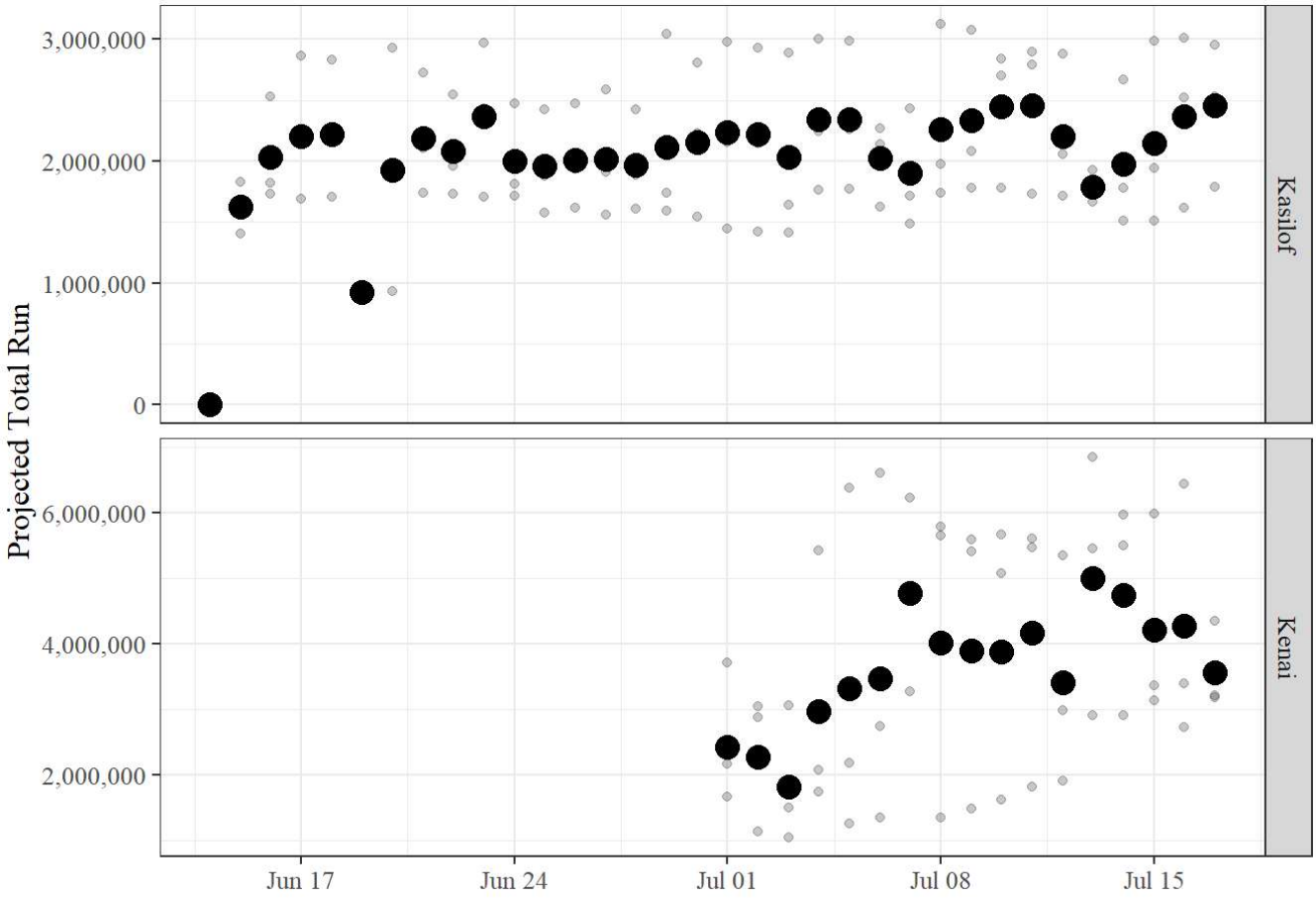

Figure 2.- Weighted total run estimates (black dots) using the top three selected run timing models by projection date and stock. Grey dots represent individual total run projections for each selected model by date.