Prepared by: Kyle Gatt

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	1,324,762
	Kasilof Section Set Net Fishery	1,189
	Kenai Section Set Net Fishery	24,785
	Northern District Set Net Fishery - Eastern Subdistrict	22,309
	Northern District Set Net Fishery - General Subdistrict	16,438
	UCI EEZ	317,579
	Western Subdistrict Set Net Fishery	87,747

Run component	Fishery	Cumulative season total
	Subtotal	1,794,809
Escapement	Crescent Escapement	45,028
	Fish Creek Escapement	37,793
	Kasilof River Escapement	1,029,490
	Kenai River Escapement	1,880,032
	Susitna Escapement	167,316
	Other	473,949
	Subtotal	3,633,608
Personal Use and Sport	Kasilof Personal Use Dipnet	211,707
	Kasilof Personal Use Gillnet	35,266
	Kasilof Sport	73,689
	Kenai Personal Use Dipnet	506,970
	Kenai Sport	274,432
	Subtotal	1,102,064
Grand Total		6,530,481

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	4,432
	Escapement	45,088
	Subtotal	49,520
Fish Creek	Commercial Harvest	9,146
	Escapement	37,793
	Subtotal	46,939
Kasilof	Commercial Harvest	423,948
	Escapement	1,030,863
	Personal Use and Sport	321,090
	Subtotal	1,775,900
Kenai	Commercial Harvest	1,005,101
	Escapement	1,880,032
	Personal Use and Sport	781,402
	Subtotal	3,666,535
Other	Commercial Harvest	218,312
	Escapement	473,949
	Subtotal	692,261
Susitna	Commercial Harvest	68,630
	Escapement	167,316
	Subtotal	235,946

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%	5,804	0	-Inf%	0
	0.3	0.0%	0	0	0.0%	0
	0.4	0.0%	0	0	0.0%	0
	1.1	0.0%	8,551	0	-Inf%	0
	1.2	42.0%	747,200	506,000	-48.0%	0
	1.3	46.0%	813,607	332,218	-145.0%	0
	1.4	0.0%	0	0	0.0%	0
	2.1	1.0%	9,973	0	-Inf%	0
	2.2	10.0%	173,199	221,924	22.0%	48,725
	2.3	1.0%	17,567	55,019	68.0%	37,452
	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
	0.4	0.0%	0	0	0.0%	0
	1.1	0.0%	2,661	0	-Inf%	0
	1.2	27.0%	996,951	515,248	-93.0%	0
	1.3	61.0%	2,247,393	2,143,928	-5.0%	0
	1.4	1.0%	40,632	0	-Inf%	0
	2.1	0.0%	0	0	0.0%	0
	2.2	7.0%	258,611	248,800	-4.0%	0
	2.3	3.0%	120,286	472,484	75.0%	352,198
	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	2009	94.1%	13.22	1,886,974	0.36	676,522.4	**2,010,061**
	2020	79.9%	14.42	2,221,286	0.33	729,712.1	
	2021	92.0%	15.14	1,929,351	0.31	603,826.4	
Kenai	2010	87.9%	16.97	4,170,315	0.35	1,446,985.0	**3,939,599**
	2009	95.5%	17.73	3,837,319	0.33	1,274,213.0	
	2003	96.6%	18.35	3,796,005	0.32	1,218,400.9	

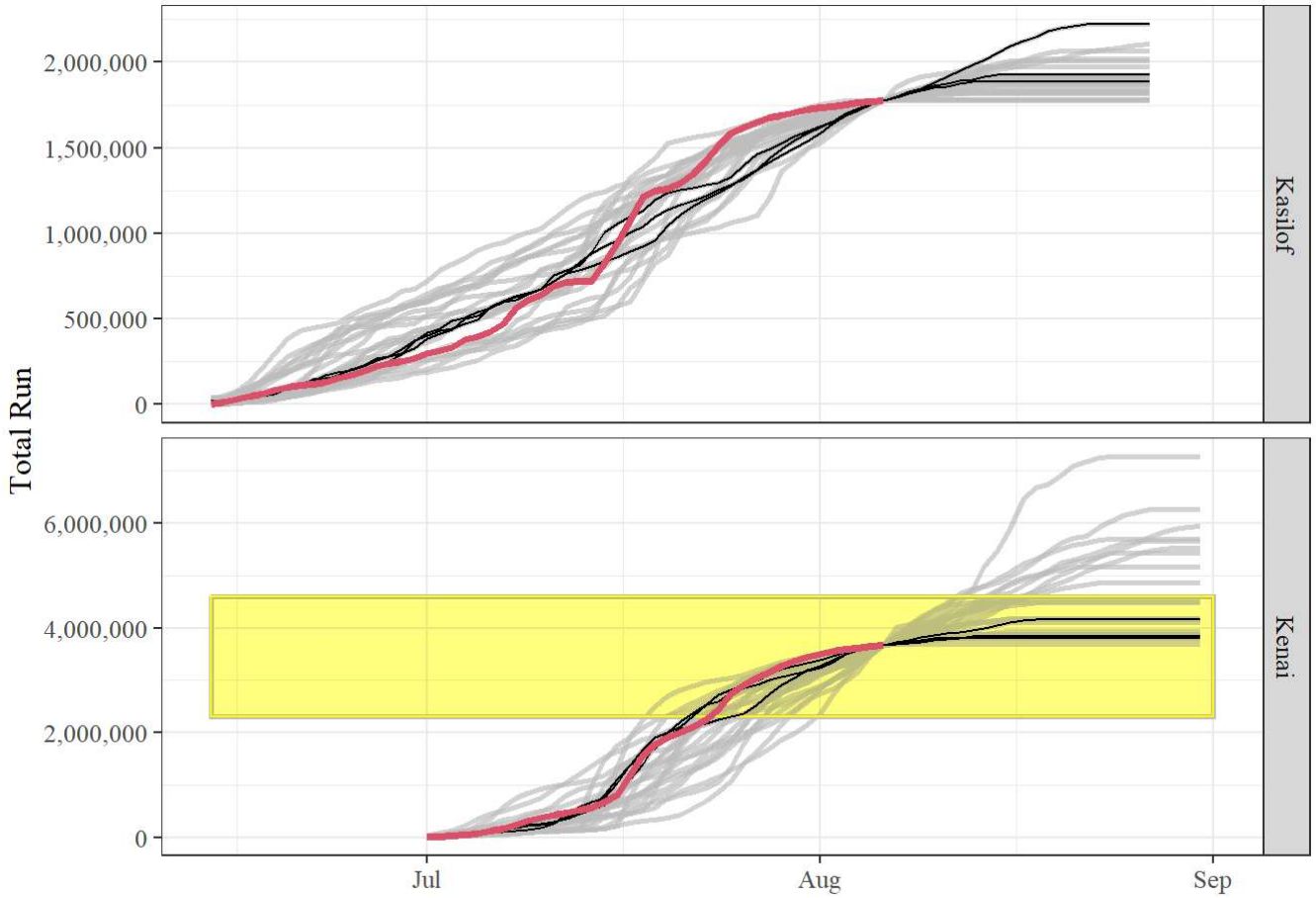

Figure 1.- The top three competing models for each stock (black lines) relative to actual daily cumulative total runs (red line). All other competing models are indicated in grey. The middle management tier (2.3 to 4.6 million fish) for late-run stock Kenai River sockeye salmon is indicated in yellow.

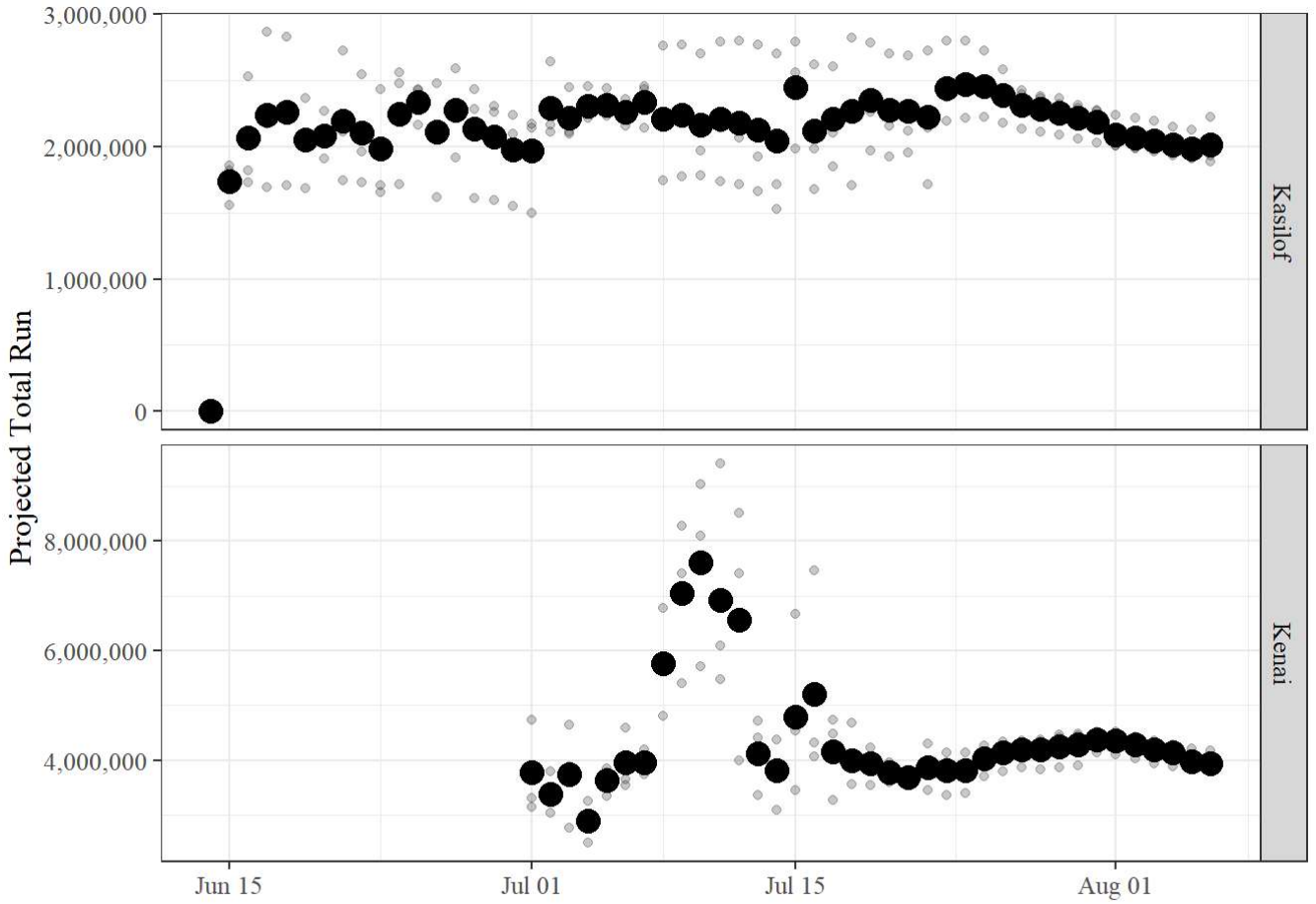

Figure 2.- Weighted total run estimates (black dots) using the top three selected run timing models by projection date and stock. Grey dots represent individual total run projections for each selected model by date.