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	848,479
	Kasilof Section Set Net Fishery	1,111
	Kenai Section Set Net Fishery	18,425
	Northern District Set Net Fishery - Eastern Subdistrict	8,739
	Northern District Set Net Fishery - General Subdistrict	9,622
	UCI EEZ	277,416
	Western Subdistrict Set Net Fishery	51,682
	Subtotal	1,215,474
Escapement	Crescent Escapement	32,448
	Fish Creek Escapement	16,433
	Kasilof River Escapement	720,767
	Kenai River Escapement	1,001,608
	Susitna Escapement	76,741
	Other	277,200

Run component	Fishery	Cumulative season total
	Subtotal	2,125,198
Personal Use and Sport	Kasilof Personal Use Dipnet	141,439
	Kasilof Personal Use Gillnet	35,266
	Kasilof Sport	51,591
	Kenai Personal Use Dipnet	267,545
	Kenai Sport	146,207
	Subtotal	642,048
Grand Total		3,982,720

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	5,627
	Escapement	32,535
	Subtotal	38,162
Fish Creek	Commercial Harvest	5,231
	Escapement	16,433
	Subtotal	21,664
Kasilof	Commercial Harvest	352,888
	Escapement	720,767
	Personal Use and Sport	228,296
	Subtotal	1,301,951
Kenai	Commercial Harvest	596,452
	Escapement	1,012,626
	Personal Use and Sport	418,303
	Subtotal	2,027,381

Stock	Run component	Total
Other	Commercial Harvest	171,578
	Escapement	277,200
	Subtotal	448,777
Susitna	Commercial Harvest	46,218
	Escapement	76,741
	Subtotal	122,959

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
	0.4	0.0%	0	0	0.0%	0
	1.2	36.0%	472,114	506,000	7.0%	33,886
	1.3	59.0%	769,353	332,218	-132.0%	0
	1.4	0.0%	0	0	0.0%	0
	2.1	0.0%	0	0	0.0%	0
	2.2	5.0%	60,483	221,924	73.0%	161,441
	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
	0.4	0.0%	0	0	0.0%	0
	1.2	20.0%	411,719	515,248	20.0%	103,529
	1.3	72.0%	1,454,719	2,143,928	32.0%	689,209
	1.4	2.0%	40,675	0	-Inf%	0
	2.1	0.0%	0	0	0.0%	0
	2.2	6.0%	120,267	248,800	52.0%	128,533
	2.3	0.0%	0	472,484	100.0%	472,484
	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	49.6%	9.28	2,625,486	0.44	1,165,613.5	**2,211,663**
	2019	63.0%	13.43	2,066,055	0.31	633,719.9	
	2003	78.7%	16.52	1,653,886	0.25	412,329.2	
Kenai	2009	55.2%	23.67	3,673,135	0.34	1,265,978.3	**3,512,428**
	2003	61.4%	24.22	3,303,284	0.34	1,112,897.4	
	2010	57.0%	25.62	3,559,762	0.32	1,133,552.1	

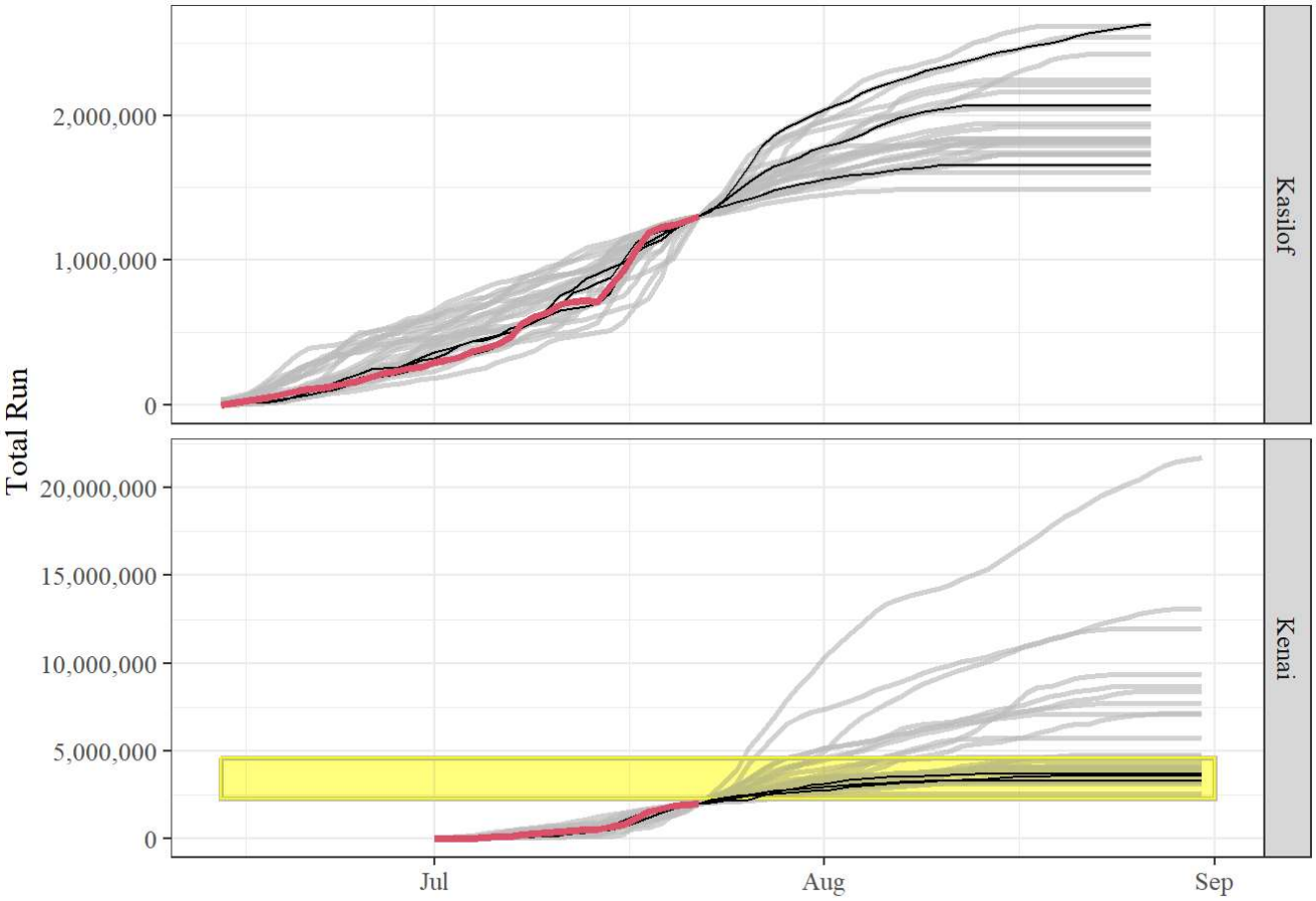

Figure 1.- The top three competing models for each stock (black lines) relative to actual daily cumulative total runs (red line). All other competing models are indicated in grey. The middle management tier (2.3 to 4.6 million fish) for late-run stock Kenai River sockeye salmon is indicated in yellow.

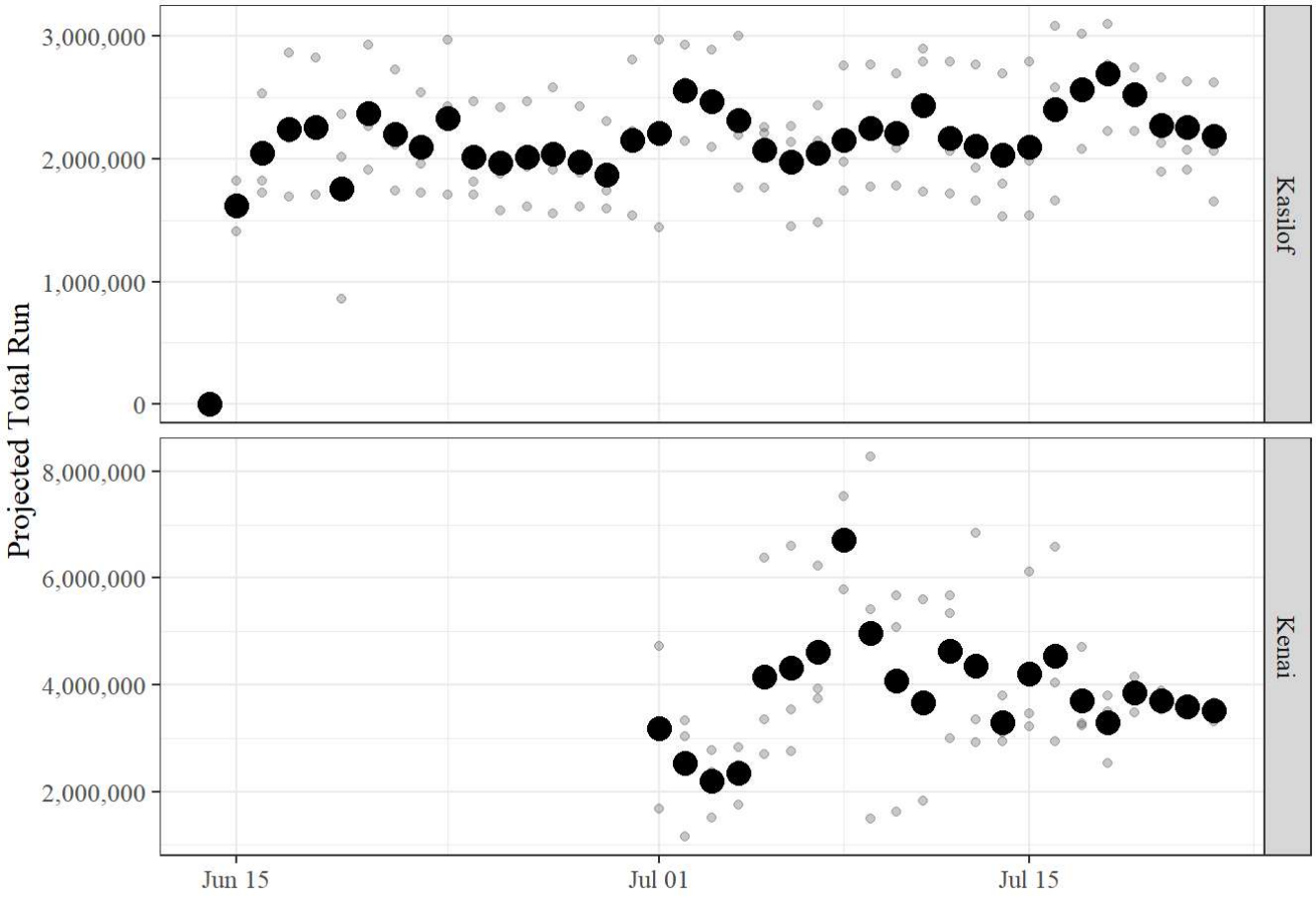

Figure 2.- Weighted total run estimates (black dots) using the top three selected run timing models by projection date and stock. Grey dots represent individual total run projections for each selected model by date.