Preliminary Harvest Rates of Western Alaska and Alaska Peninsula Chum Salmon Stocks in South Alaska Peninsula Fisheries, 2022

Oral Report: RC 3; Tab 10

A report to the Alaska Board of Fisheries

February 2023

Division of Commercial Fisheries

Overview

- Background
- Harvest rate calculation
- Total run components
- Guide to results
- Key results
- Summary & next steps

Background

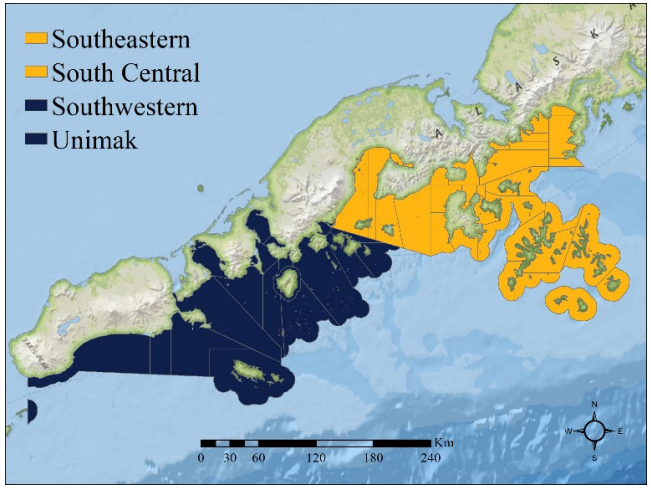
- Preliminary harvest rate estimates of chum salmon in South Peninsula commercial fisheries, 2022
  - based on stock-specific harvest (previous presentation)
- Reporting groups (stocks)
  - see previous presentation
  - total run and harvest rate not calculated for Asia and East of Kodiak
- Followed WASSIP methods
  - see Eggers et al. (2012) and Munro et al. (2012)
  - deviations detailed in RIR.5J.2023.02 (Add'l. Rpt. #16)

Harvest rate calculation

For any given stock:

$$\text{Harvest Rate} = \frac{\text{Harvest}}{\text{Total Run}}$$

S. Pen. harvest

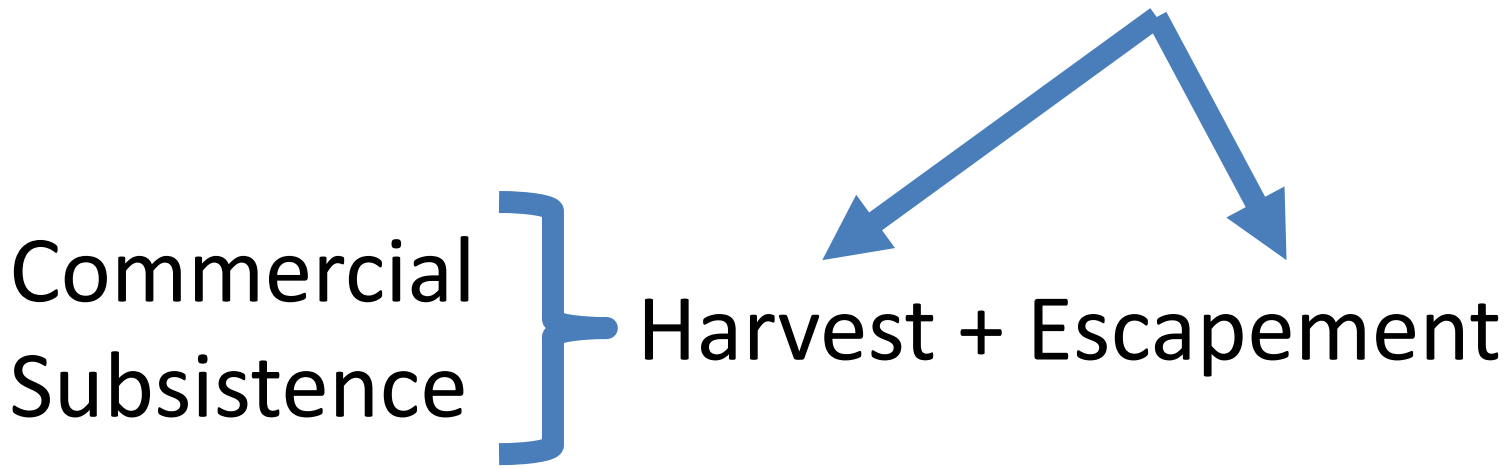


Harvest rates not estimated for fisheries outside of South Peninsula

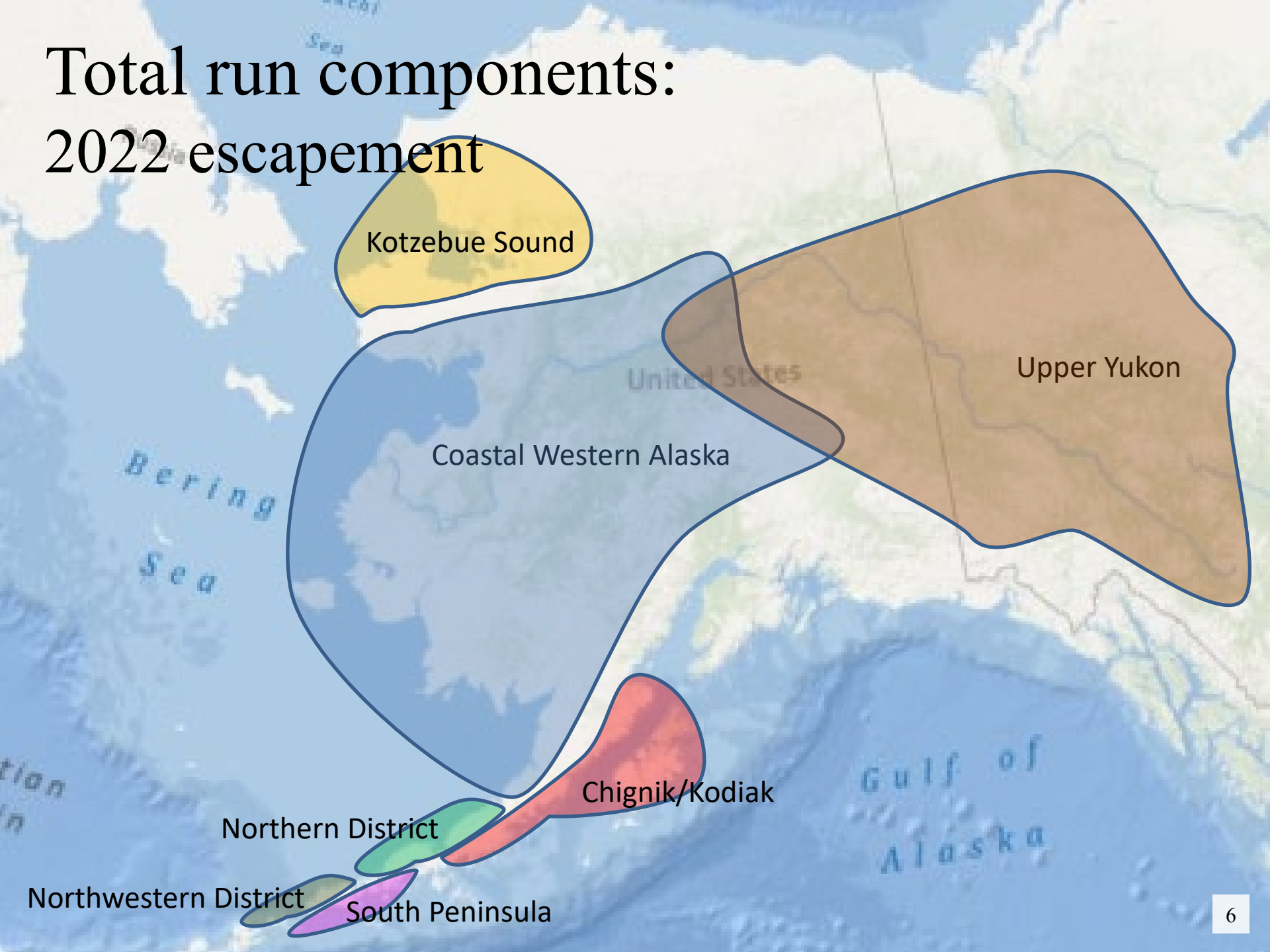
Harvest rate calculation

For any given stock:

$$\text{Harvest Rate} = \frac{\text{Harvest}}{\text{Total Run}}$$



Total run components: 2022 escapement



Total run components:
2022 escapement

Estimating regional escapements not commonly done

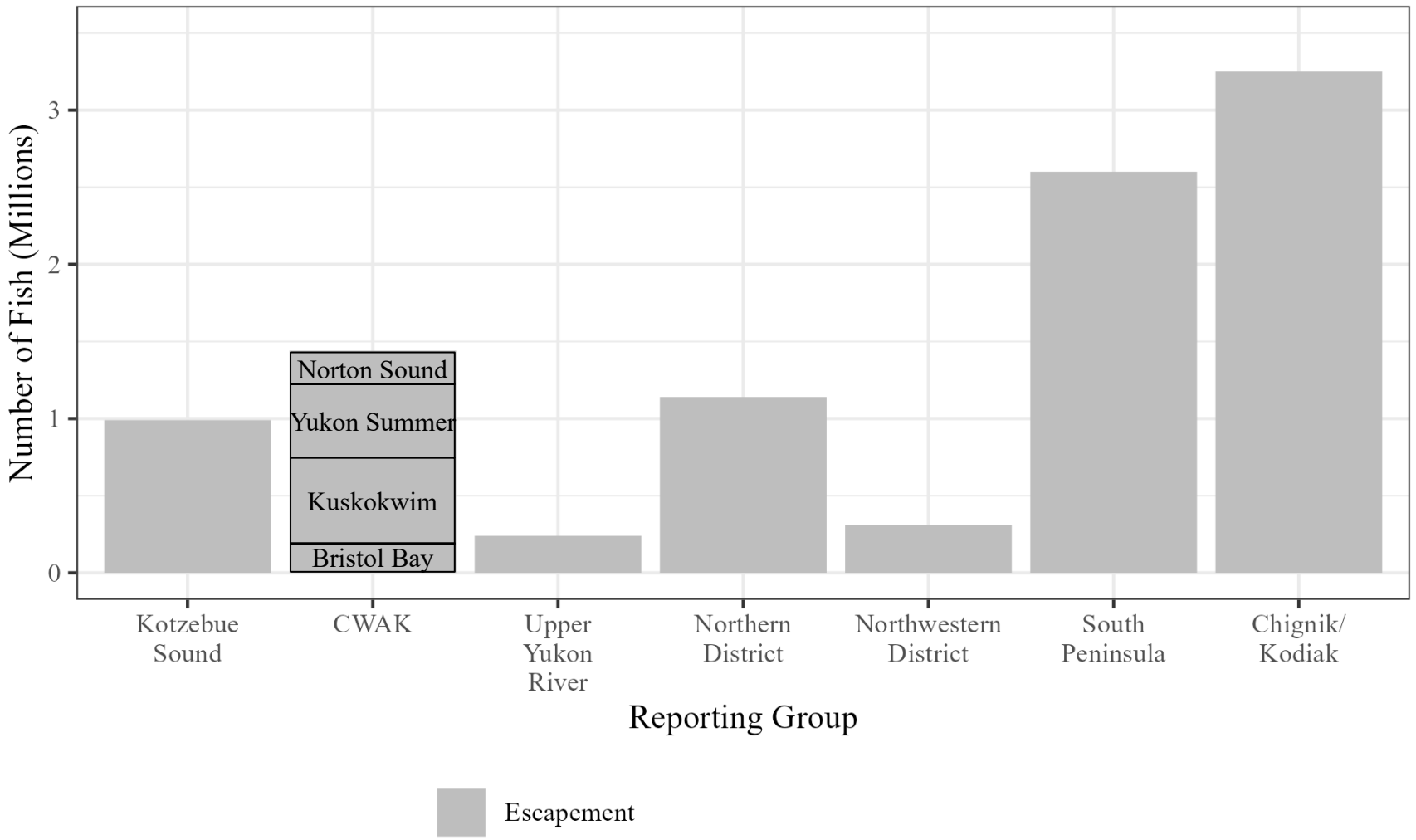
- lack of complete assessment (e.g., aerial survey indexes)
- limited run reconstructions

Followed WASSIP methods for chum salmon (Eggers et al. 2012)

- deviations detailed in RIR 5J.2023.02
    - e.g., Kuskokwim Area reduced assessment projects compared to WASSIP (2007-2009)

- Tables 9–20 in RIR 5J.2023.02

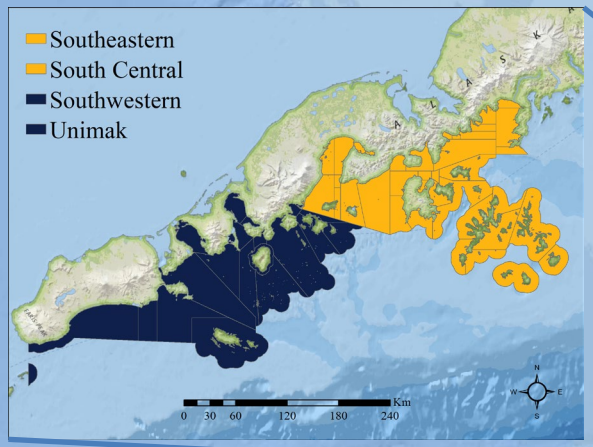
Total run components: 2022 escapement



Total run components: 2022 commercial harvest

Non-South Peninsula
2022 fisheries:
including inriver/terminal

South Peninsula 2022



Kodiak Management Area
harvest not included

Total run components:
2022 commercial harvest

Gathering Harvest Data

Non-South Peninsula fisheries harvest

- chum harvest numbers from each fishery
- followed WASSIP plan (Eggers et al. 2011)
    - same geographic extent

Total run components:
2022 commercial harvest

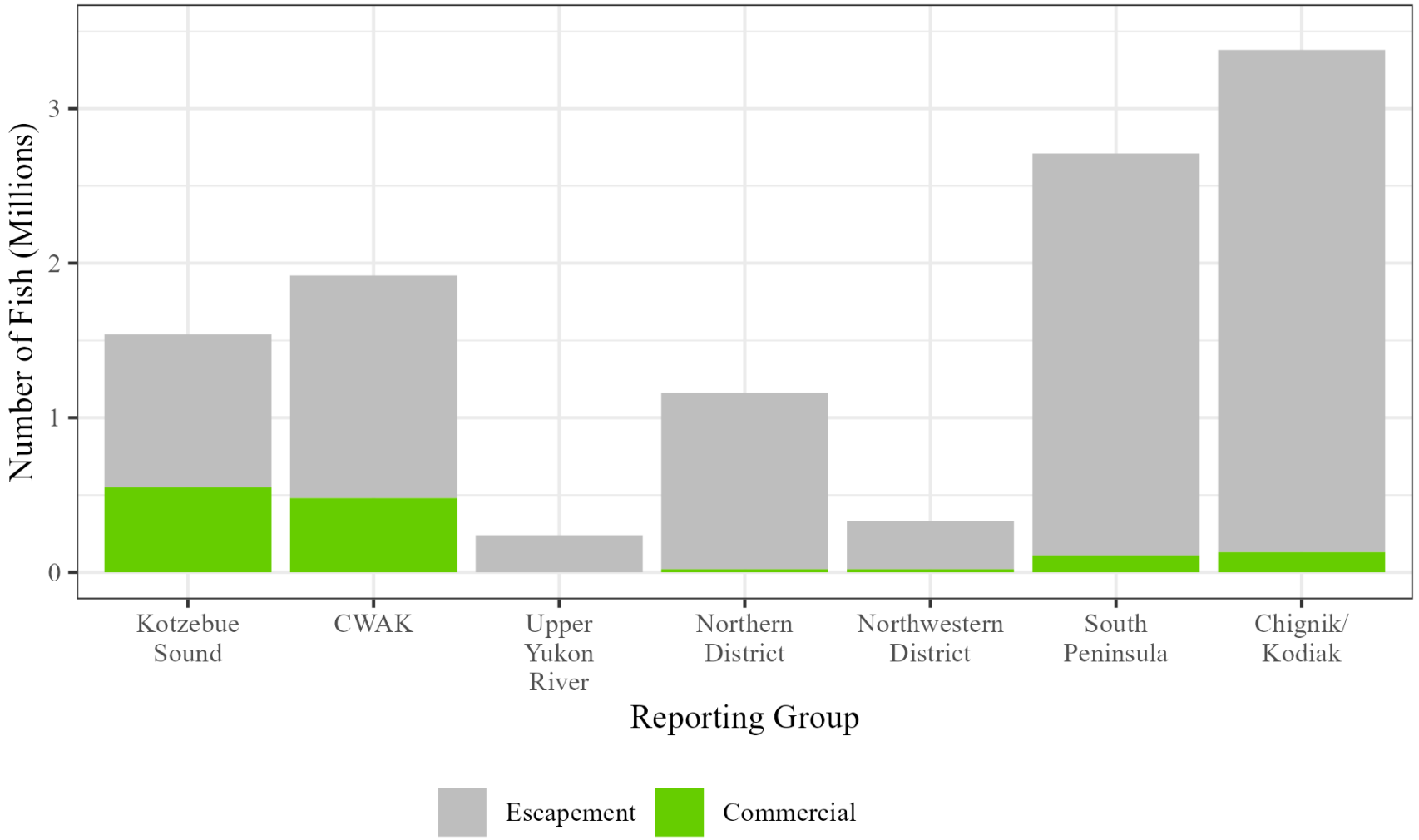
Splitting harvest into stocks

Stock-specific harvest estimates

- proxy stock compositions (3 yrs. WASSIP combined)
- multiplied 2022 harvest by proxy stock compositions
  - 2022 harvest split to match WASSIP strata
- Tables 1–8 in RIR 5J.2023.02

ASSUMPTION: 2007–2009 stock compositions are representative of harvest in 2022

Total run components:
2022 escapement & commercial harvest



Total run components: 2022 subsistence harvest

Proxy data (final harvest not available)

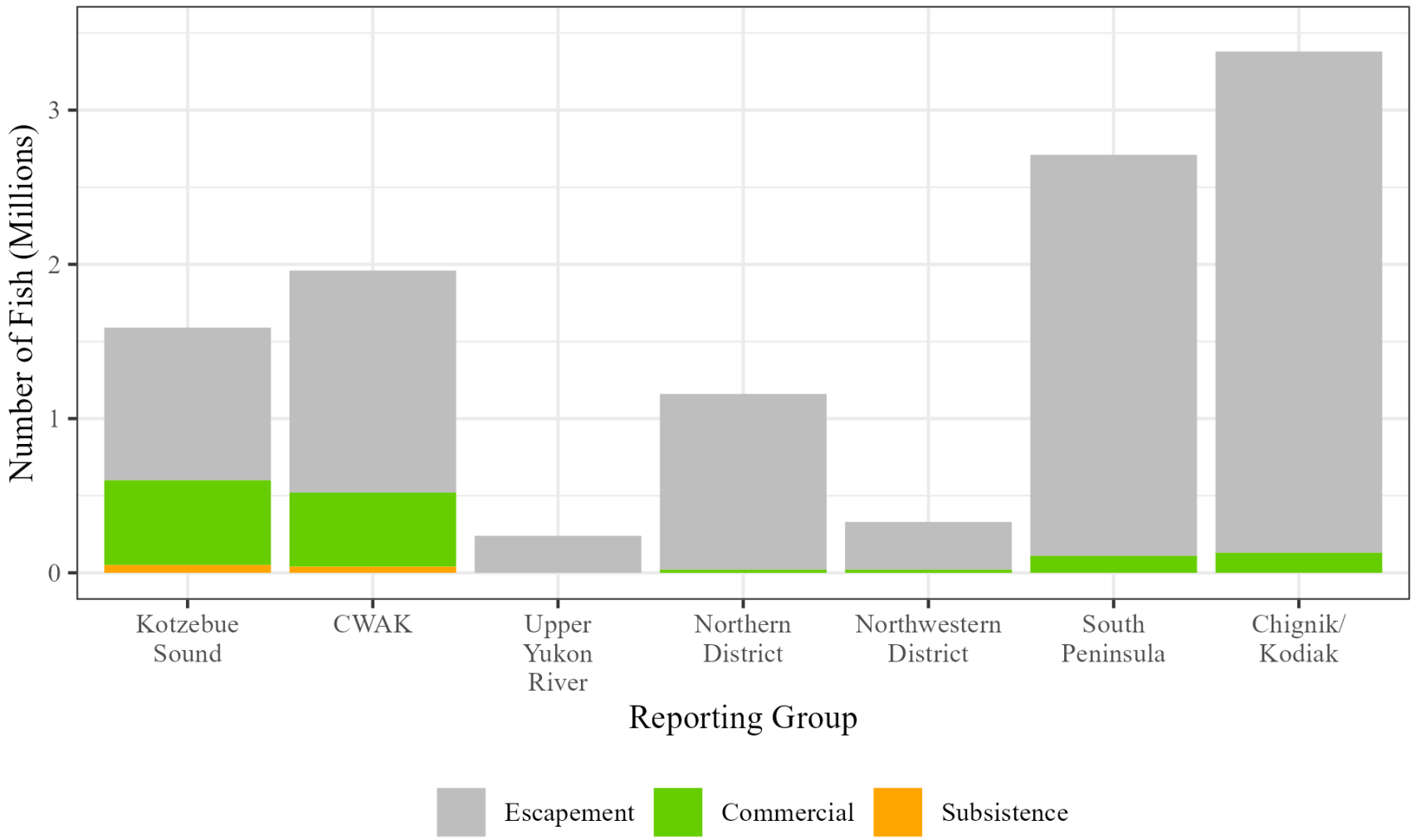
- Yukon: preliminary 2022 survey estimates
- Kuskokwim: 2021 data
- other: averages (5 yr.)

Used WASSIP methods (Munro et al. 2012)

- WASSIP stock compositions when available
- otherwise 100% local stock

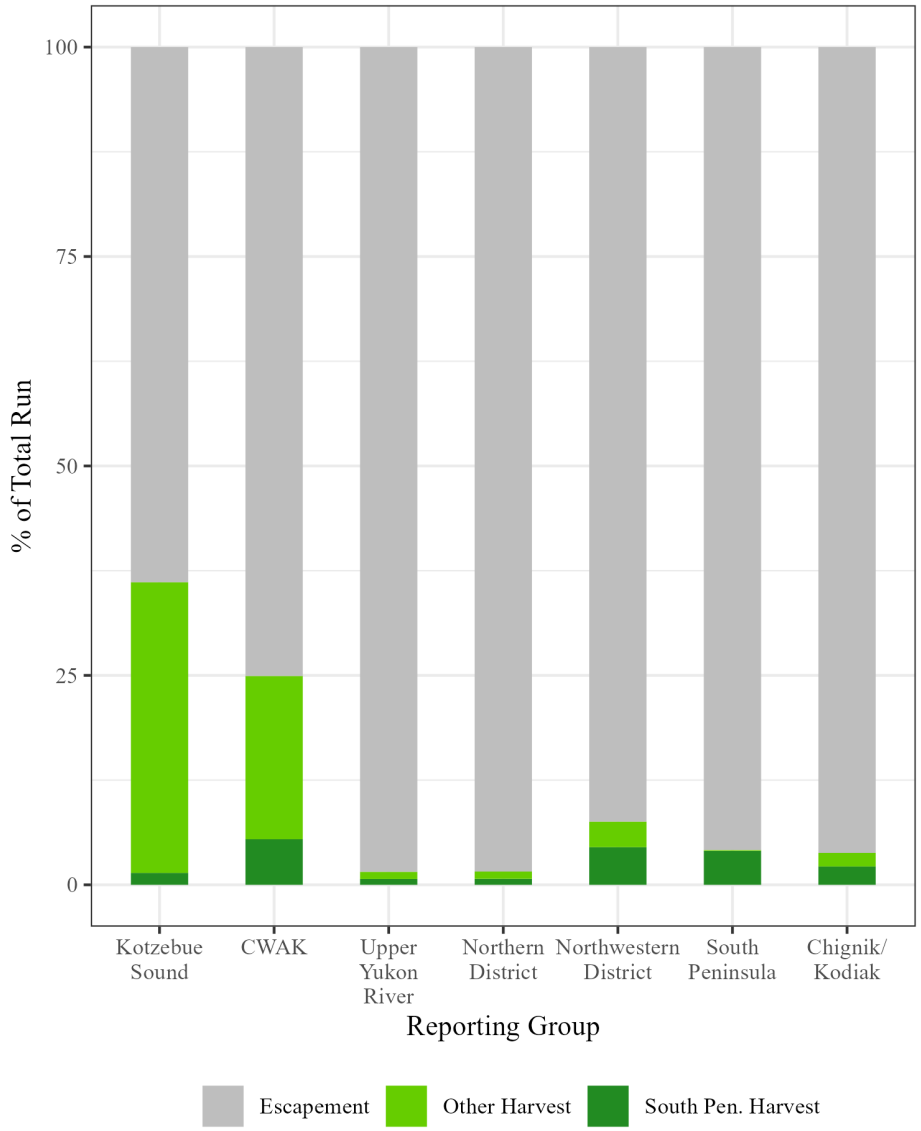
Total run components:

2022 escapement, commercial & subsistence harvest



Total run components:

2022 percent contribution by stock



Total run: WASSIP comparison

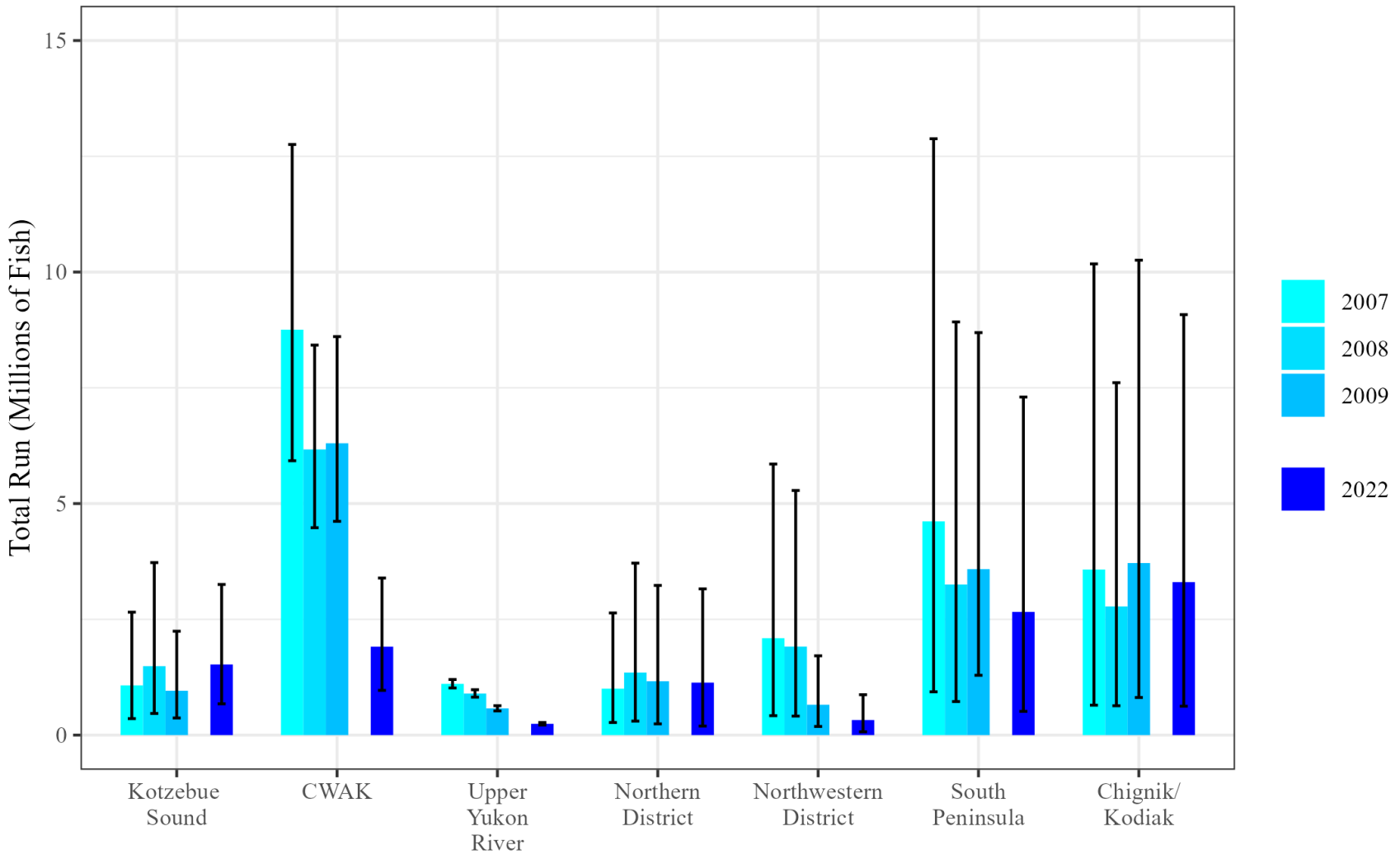
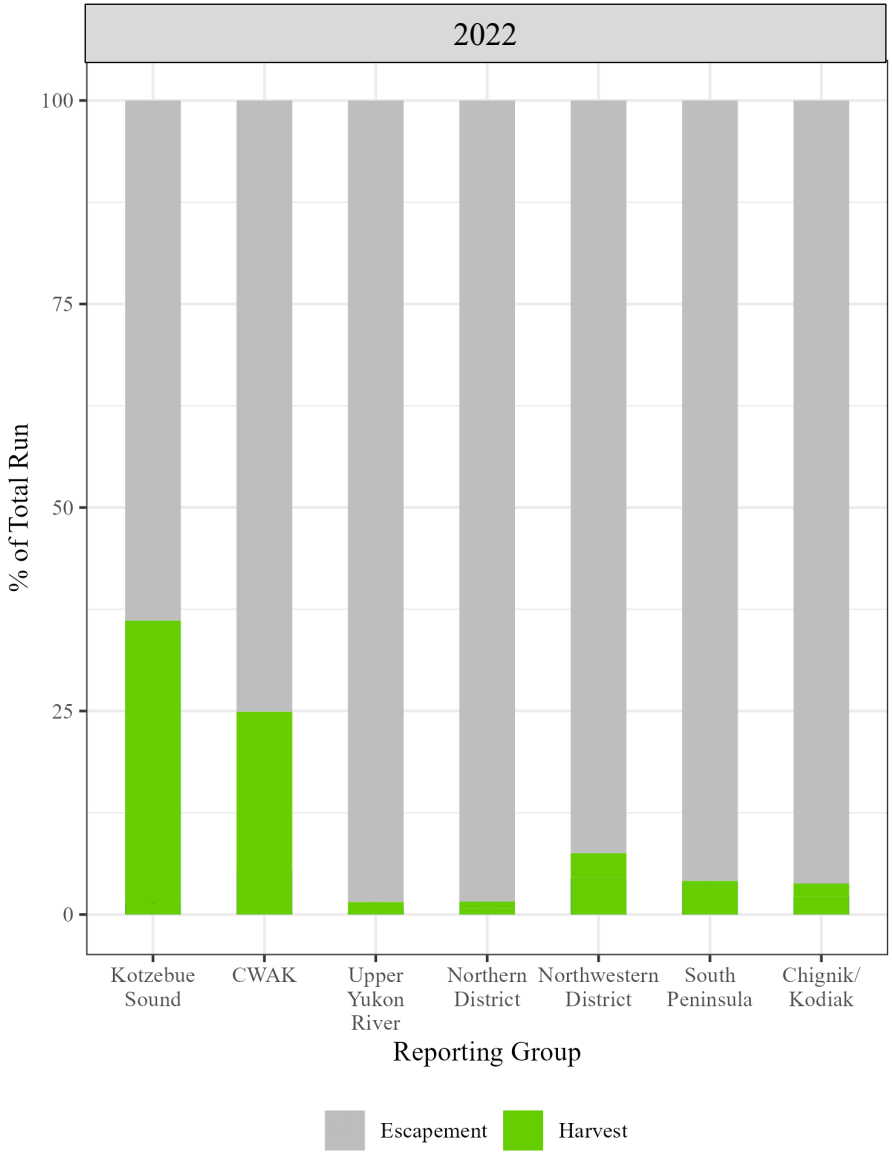
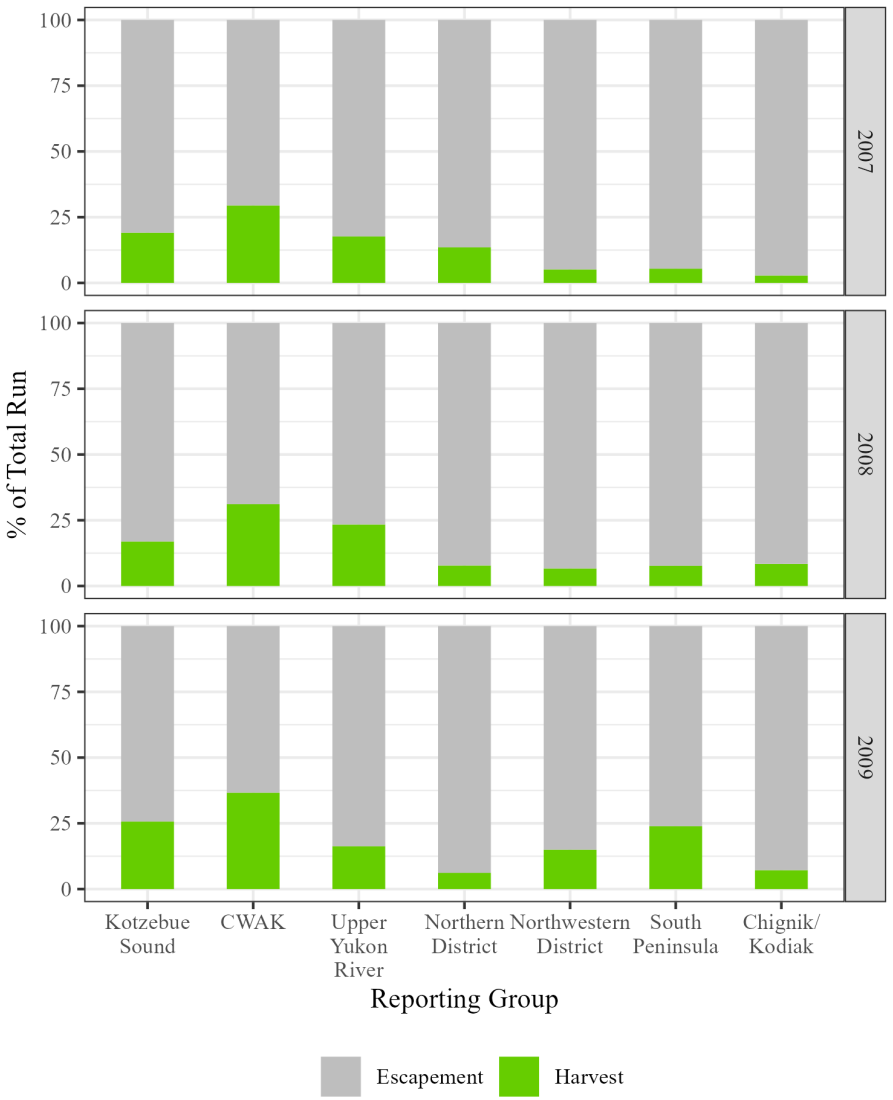


Figure 1, RIR.5J.2023.02

Total run components: WASSIP comparison





Guide to results

Overall	June/Post-June	Post-June Months	Areas	Area/Gear	Spatiotemporal Strata	Harvest
South Peninsula	June		Unimak/SW	Unimak/SW Seine	June Seine 1	24,254
					June Seine 2	123,139
					June Seine 3	120,443
					June Seine 4	54,039
				Unimak/SW Gillnet	June Gillnet 1	10,797
					June Gillnet 2	15,665
					June Gillnet 3	16,302
					June Gillnet 4	1,487
			SE/SC	SE/SC Seine	June Seine 1	16,419
					June Seine 2	41,246
					June Seine 3	34,281
					June Seine 4	75,336
				SE/SC Gillnet	June Gillnet	10,729
	Post-June	July	Unimak/SW	Unimak/SW Seine	July Seine 1	30,008
					July Seine 2	12,708
				Unimak/SW Gillnet	July Gillnet 1	2,027
					July Gillnet 2	3,812
			SC/SE	SE/SC Seine	July Seine 1	32,704
					July Seine 2	36,682
					July Seine 3	56,716
				SE/SC Gillnet	July Gillnet 1	4,092
					July Gillnet 2	4,833
					July Gillnet 3	5,189
		August	Unimak/SW	Unimak/SW Seine	August Seine 1	18,807
					August Seine 2	10,017
			SE/SC	SE/SC Seine	August Seine 1	35,706
					August Seine 2	9,793
			South Pen	Gillnet	South Pen August Gillnet	7,048

Harvest rate estimates Area/Gear level and up. No individual spatiotemporal strata.

Guide to results

Example Table:

Table 25.–Unimak and Southwestern Districts, South Alaska Peninsula area, June 2022, seine, all strata. Estimates of stock-specific harvest rate including median, 90% credibility interval, mean, and standard deviation (SD).

	Harvest Rate (%) Harvest = 321,875; 4 strata				
		90% CI			
Reporting group	Median	5%	95%	Mean	SD
Kotzebue Sound	0.8	0.3	1.7	0.9	0.4
CWAK	3.2	1.8	5.5	3.3	1.1
Upper Yukon	0.4	0.0	1.1	0.4	0.3
Northern Dist.	0.5	0.1	2.1	0.7	0.7
Northwestern Dist.	3.1	0.8	9.8	3.9	2.9
South Peninsula	0.3	0.1	1.3	0.5	0.4
Chignik/Kodiak	0.1	0.0	0.6	0.2	0.2

Note: Harvest is summed from experimental design table (Table 4, Dann et al. 2023).

Note: Corresponds to stock composition and harvest Table 12 (Dann et al. 2023).

Note: Harvest may differ from stock composition and harvest tables in Dann et al. (2023) because of sampling from lognormal distributions and rounding errors.

Note: Harvest rate estimates for the Chignik/Kodiak reporting group are likely overestimated, as the total run estimate does not include Kodiak commercial chum salmon harvest.

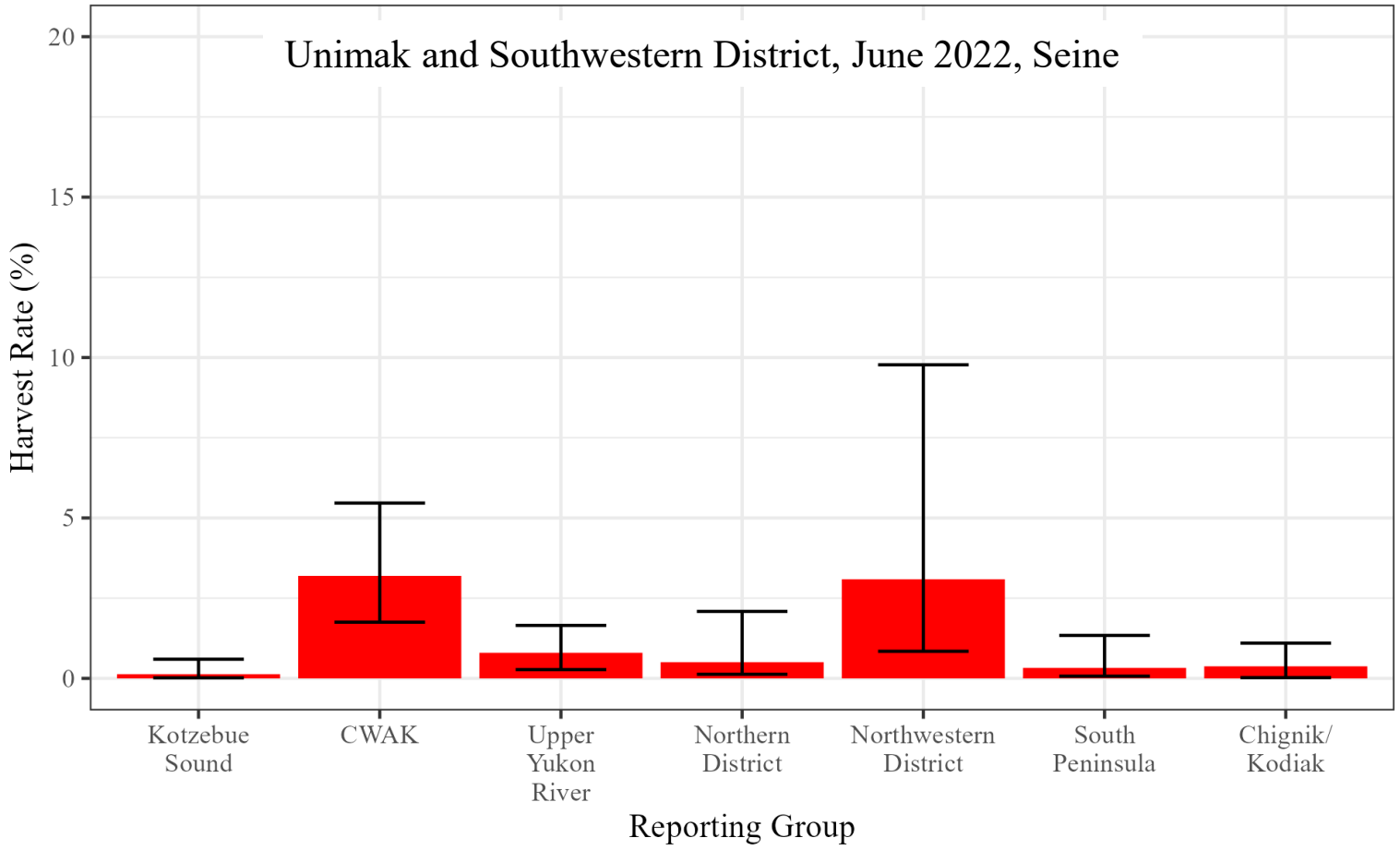
Stock-specific harvest rates (Tables 22–40)

Table 25, RIR.5J.2023.02

Guide to results

Stock-specific harvest rates (Figures 2–21)

Example Figure:



Guide to results

Stock-specific harvest rates (Figures 2–21)

Example Figure (scaled to 100%):

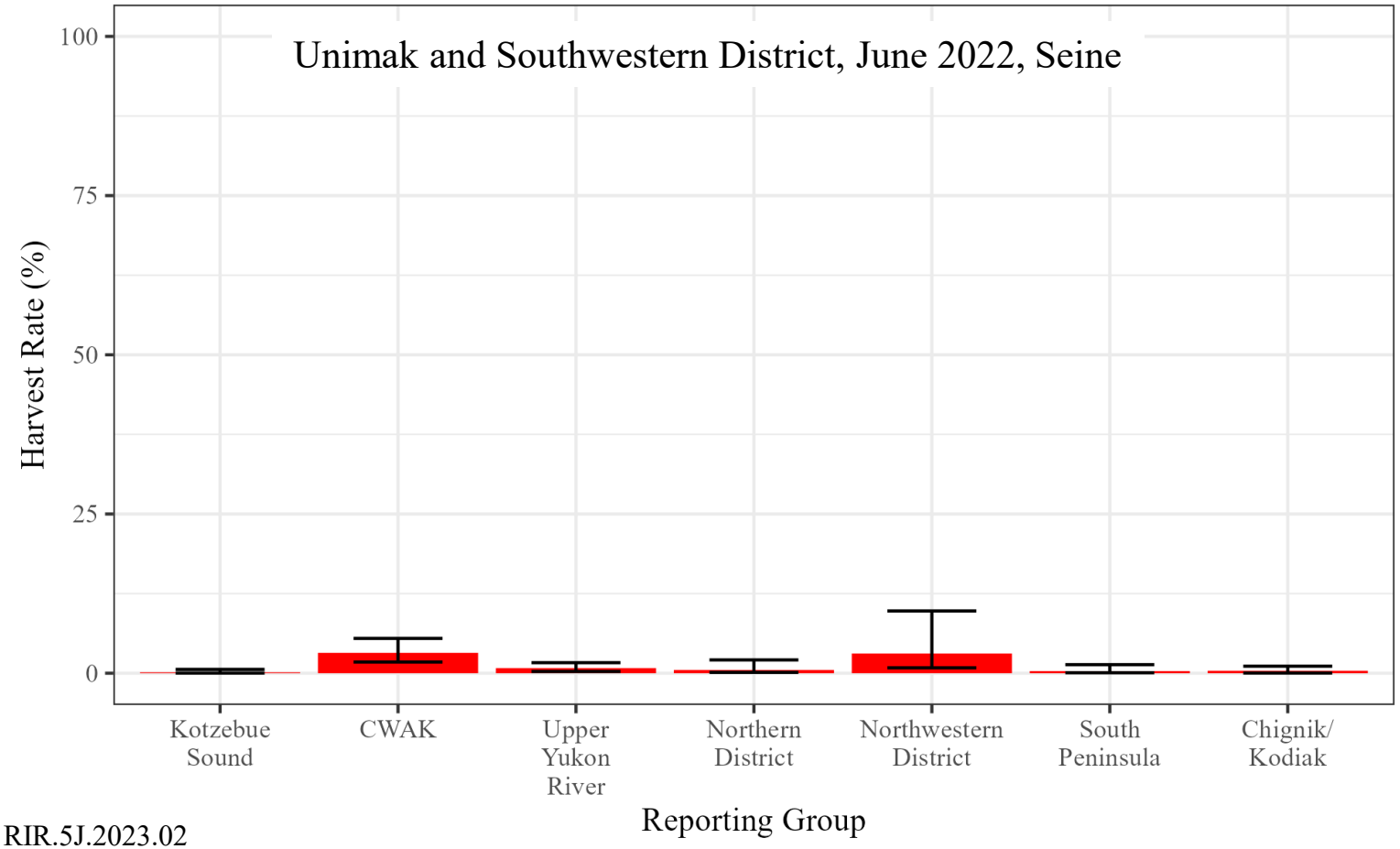


Figure 5, RIR.5J.2023.02

Key results

Overall South Peninsula stock-specific harvest rates, 2022

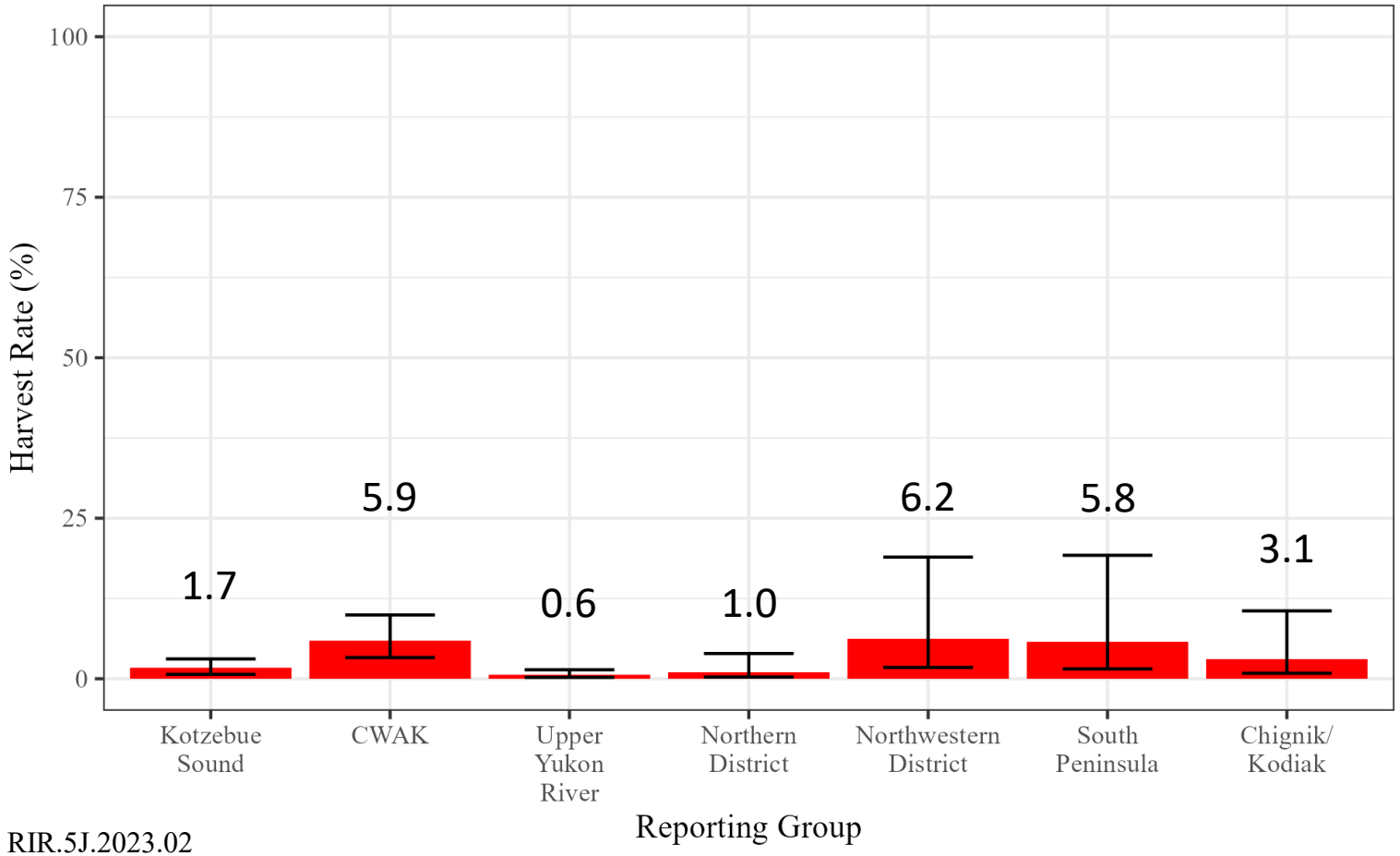


Figure 21, RIR.5J.2023.02

Key summary results

June/Post-June stratified estimates of harvest rates

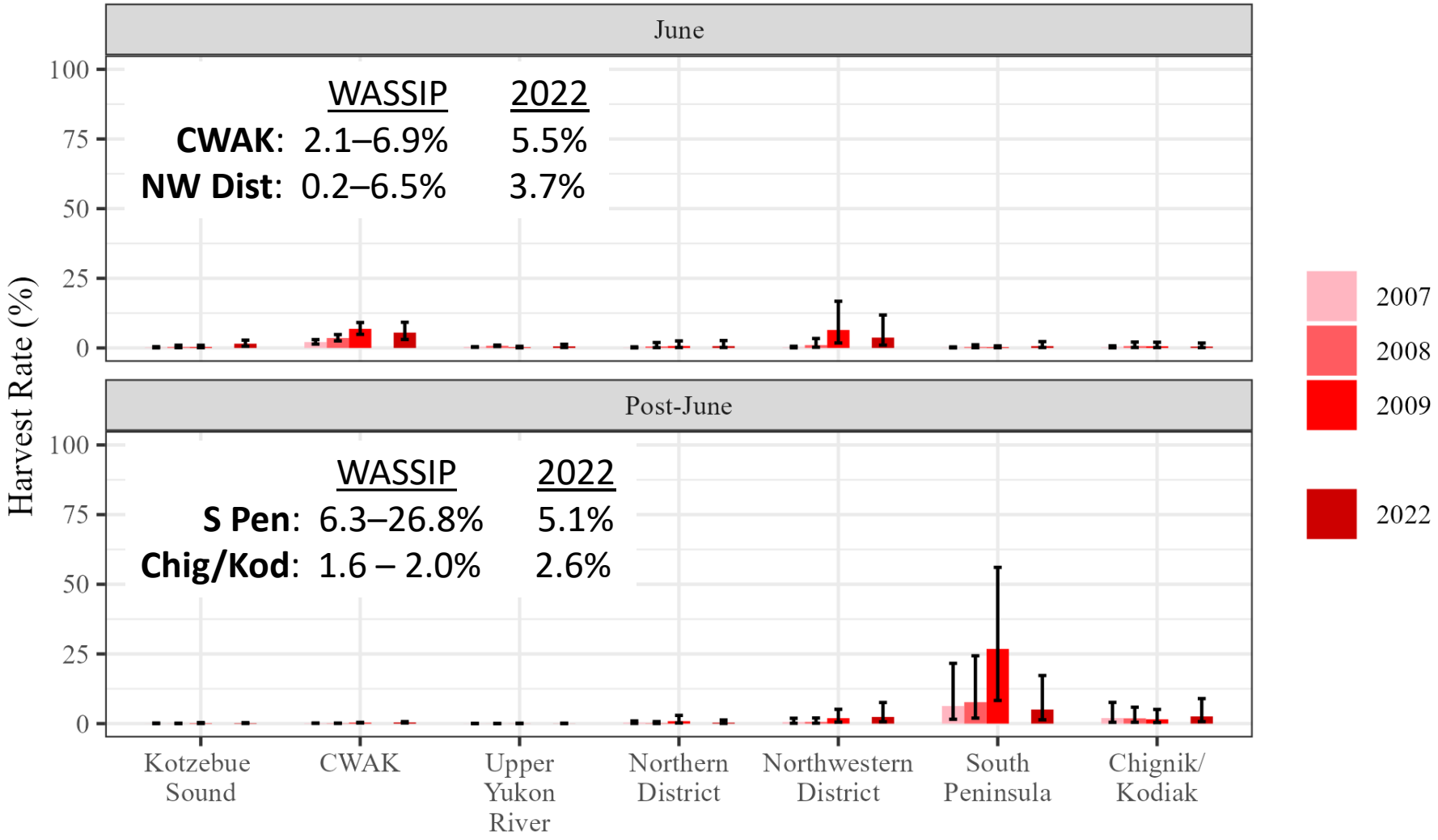


Figure 22, RIR.5J.2023.02

Summary

Preliminary results

- harvest – includes proxy subsistence harvest
- escapement – some preliminary estimates
- needs additional technical review

Remember key assumption

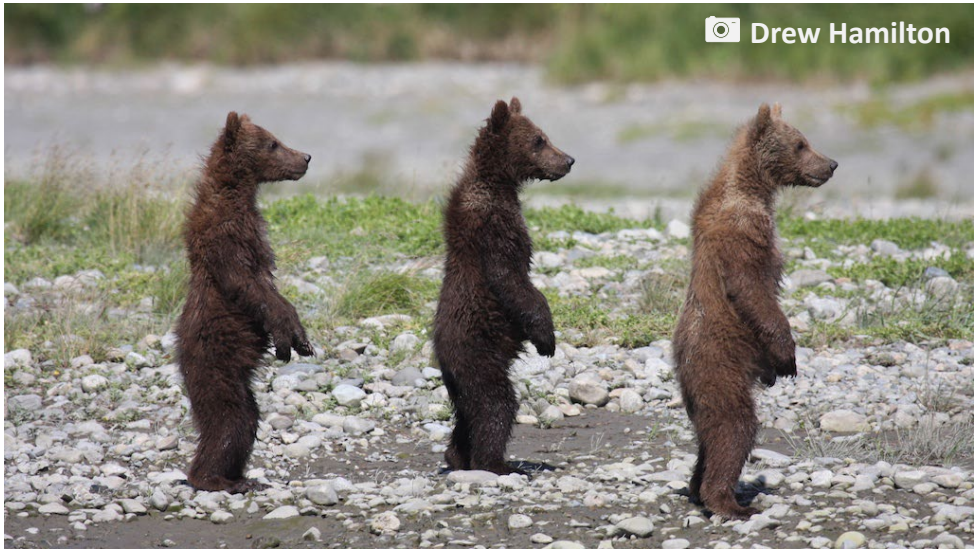
- WASSIP stock compositions suitable proxy for non-South Peninsula harvest, 2022

Total run likely biased low ➔ **Harvest rate overestimate**

- harvest – does not include outside WASSIP area
- escapement – attempted complete accounting

Next steps

- Improvements and updates based upon:
  - final 2022 subsistence harvest estimates
  - technical review of data and methods
  - any additional information
- Continue sampling and analysis in 2023



Eric Volk

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- Gene Conservation Laboratory

References

Eggers, D. M., M. J. Witteveen, T. T. Baker, D. F. Evenson, J. M. Berger, H. A. Hoyt, H. L. Hildebrand, W. D. Templin, C. Habicht, and E. C. Volk. 2011. Results from sampling the 2006–2009 commercial and subsistence fisheries in the Western Alaska Salmon Stock Identification Program. Alaska Department of Fish and Game, Special Publication No.11-10, Anchorage. http://www.adfg.alaska.gov/FedAidPDFs/SP11-10.pdf

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