# Historical Data

## Chinook Salmon In-Season Bayesian Risk Assessment Tool

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### Version 1.2.0 (For use in 2019)

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👥 **Developers:** Ben Staton and Matt Catalano, Auburn University Quantitative Fisheries Laboratory

🎚 **Tool Interface:** https://bstaton.shinyapps.io/BayesTool

 **Source Code:** https://github.com/bstaton1/kusko-bayes-tool

❓ **User Manual:** *Accessible through the tool interface*

ℹ **Technical Documentation:** *Accessible through the tool interface*

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This document is intended to be a companion to the Chinook Salmon In-Season Bayesian Risk Assessment Tool (hereafter, "Bayes' Tool" or simply "the Tool") that provides some historical data users can test the Tool out with.

This document is organized into two sections:

1. **Values for Estimation Tab**: here, users will find the appropriate information to enter on the Estimation tab for all years since 2008. Table 1 shows the pre-season run size forecasts that would have been used had the run reconstruction (Smith 2019) been available back then, if the forecasting rule used now had been used back then, and if the run estimates were the same back then as they are now. Table 2 shows the cumulative catch-per-unit-effort at weekly intervals starting on June 12$^{\text{th}}$ in these years.

2. **Values for Reference**: here, users will find the "true" values the Tool attempts to estimate: run size and harvest levels given different escapement targets.

**NOTE**: it is inappropriate to interpret the output of the tool in these years as "management could have been so much better if the Tool had been used back then", because much of the data the Tool uses were not available back then. This document is provided simply to allow users to test the Tool and practice using and interpreting its output using real data.

**The Tool was developed for Kuskokwim River Chinook salmon only**. Hereafter, all references in this document to salmon, fish, runs, escapement, and harvest are about the drainage-wide stock of Chinook salmon in the Kuskokwim River.

# Values for Estimation Tab

TABLE 1. Pre-season run size forecast expectation (mean) and uncertainty (coefficient of variation; CV). Run size data are from Smith (2019).

| Year[a] | Mean[b] | CV |
|---|---|---|
| 2008 | 244,000 | 0.29 |
| 2009 | 211,000 | 0.29 |
| 2010 | 191,000 | 0.29 |
| 2011 | 114,000 | 0.30 |
| 2012 | 114,000 | 0.29 |
| 2013 | 79,000 | 0.29 |
| 2014 | 84,000 | 0.29 |
| 2015 | 84,000 | 0.29 |
| 2016 | 125,000 | 0.29 |
| 2017 | 129,000 | 0.29 |
| 2018 | 133,000 | 0.28 |

*Note:*

Do not enter commas into the tool.

[a] The year the user is interested in testing out.

[b] Under the current forecast method, the mean for year $t$ is the value for year $t-1$. Values rounded to the nearest thousand fish.

TABLE 2. Cumulative catch-per-unit-effort (CCPUE) from the Bethel Test Fishery. These data are also available online[a]. The methods for the Bethel Test Fishery are described in Bue and Lipka (2016).

| Year | 6/12 | 6/19 | 6/26 | 7/4 | 7/11 | 7/18 |
|------|------|------|------|-----|------|------|
| **2008** | 46 | 160 | 374 | 539 | 579 | 607 |
| **2009** | 62 | 232 | 522 | 650 | 676 | 697 |
| **2010** | 23 | 193 | 314 | 393 | 433 | 451 |
| **2011** | 78 | 229 | 363 | 490 | 548 | 576 |
| **2012** | 6 | 50 | 228 | 334 | 401 | 410 |
| **2013** | 9 | 89 | 187 | 226 | 254 | 261 |
| **2014** | 252 | 421 | 539 | 618 | 633 | 645 |
| **2015** | 117 | 259 | 366 | 484 | 535 | 571 |
| **2016** | 165 | 278 | 432 | 542 | 634 | 659 |
| **2017** | 21 | 71 | 168 | 278 | 321 | 350 |
| **2018** | 66 | 198 | 385 | 556 | 622 | 645 |

[a] **BTF Data:** http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareakuskokwim.btf

# Values for Reference

TABLE 3. Estimated run size in each year and different levels of harvest that would have resulted in different levels of escapement. For example, the minimum value is the number of fish that could have been harvested to obtain exactly 120,000 escapement. Zero values indicate any level of harvest would have resulted in escapement less than the specific escapement level of interest.

| Year | Run Size[a] | Minimum[1] | Medium[2] | Maximum[3] |
|------|-------------|------------|-----------|------------|
| **2008** | 211,000 | 91,000 | 118,500 | 146,000 |
| **2009** | 191,000 | 71,000 | 98,500 | 126,000 |
| **2010** | 114,000 | 0 | 21,500 | 49,000 |
| **2011** | 114,000 | 0 | 21,500 | 49,000 |
| **2012** | 79,000 | 0 | 0 | 14,000 |
| **2013** | 84,000 | 0 | 0 | 19,000 |
| **2014** | 84,000 | 0 | 0 | 19,000 |
| **2015** | 125,000 | 5,000 | 32,500 | 60,000 |
| **2016** | 129,000 | 9,000 | 36,500 | 64,000 |
| **2017** | 133,000 | 13,000 | 40,500 | 68,000 |
| **2018** | 132,000 | 12,000 | 39,500 | 67,000 |

Values rounded to the nearest thousand fish.

[a] Most current run size estimates used; presented in Smith (2019)

**Harvest that would have resulted in escapement at the:**

[1] upper end of the escapement goal: 120,000

[2] midpoint of the escapement goal: 92,500

[3] lower end of the escapement goal: 65,000

# References

Bue, D. G. and Lipka, C. G. 2016. Characterization of the 2011 salmon run in the Kuskokwim River based on the test fishery at Bethel. Fishery Data Series 16-05, Alaska Department of Fish and Game, Anchorage, AK. Available at: http://www.adfg.alaska.gov/FedAidPDFs/FDS16-05.pdf [last accessed 2/20/2019].

Smith, N. J. 2019. Kuskokwim River Chinook salmon run reconstruction and 2019 forecast. Regional Information Report 3A.19-02, Alaska Department of Fish and Game, Anchorage, AK. Available at: http://www.adfg.alaska.gov/FedAidPDFs/RIR.3A.2019.02.pdf [last accessed 4/22/2019].