SRKW Chinook Low Abundance Threshold update

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Purpose

Inform the Council and the public on new information pertaining to the Chinook low abundance threshold numerical value technical review.

Amendment 21

In 2020 a threshold was established for annual Chinook salmon abundance, in U.S. waters north of Cape Falcon, Oregon, below which the Council and NMFS would take additional fishery management actions through the adoption of annual ocean salmon management measures.

- The Council was advised during the threshold selection process that the threshold's numerical value would likely change as models used to inform the threshold were updated (Range of Alternatives) (Amendment 21 added language to the FMP allowing for the update and review process as explained in Section 6.6.8)

Table 3.1.a – Summary of Alternatives for NOF Chinook salmon abundance TS1 thresholds*

Alternative	Brief Description	Result	If adjusted for error	Comment
3.1.2.a	lowest year	813,000	968,000	1994
3.1.2.b	arithmetic mean of three lowest years	874,000	1,040,000	1994, 1998, and 2007
3.1.2.c	2020 NMFS guidance	966,000	N/A	the arithmetic mean of the seven lowest years of abundance (1994-1996, 1998-2000, and 2007)
3.1.2.d	Maximum of mid-90s	1,144,000	1,362,000	the max abundance from 1995 through 2000 occurred in 1997

*Note: These values represent the current combined outputs from the FRAM and Shelton et al. models, and are subject to change whenever recalibrating these models, but the methodology determining each value would remain fixed as described in this report.

Updating the Models

➢ In March of 2022, NMFS advised the Council that updates to the underlying models used to calculate the threshold should undergo a technical review as updates were expected to occur that would affect the numerical value of the threshold when applying the same methodology

➢ At its September 2022 meeting, the Council approved a technical review of the updates to each model as they became available

- However, NMFS was not recommending, nor did the Council adopt, a review of the threshold. Our expectation is that it remains responsive to concerns for SRKW by continuing to include:
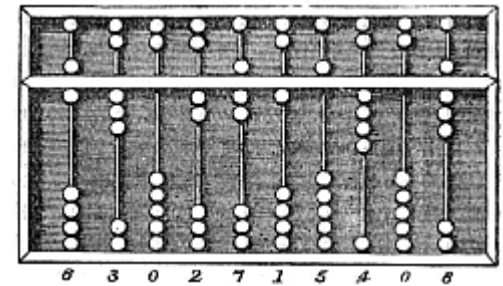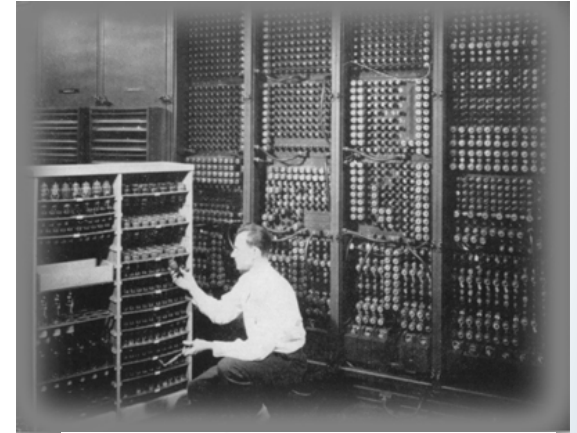
Consecutive years of low abundance and a mix of SRKW status. *Specifically, the years 1994 – 1996, 1998 – 2000 and 2007* which have a mix of SRKW status (e.g. fecundity, survival, population growth), with two relatively good status years (1994 and 2007). These years account for various scenarios of low abundance trends of Chinook salmon that the SRKW may experience into the future, taking into account the biological needs of SRKW.

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What was updated?

1. FRAM-based estimates of total ocean abundance

   - The threshold was constructed using Fishery Regulation Assessment Model (FRAM (version 6.2)) and the Shelton et al. model distribution for Chinook salmon (version 2019)

   - FRAM Version 6.2 was used in original threshold calculation, while version 7.1.1 will be used going forward for the salmon fishery planning process

   - Mr. Jon Carey (NMFS, STT) provided a summary of updates to the STT/SSC during the technical review that could impact the threshold's numerical value
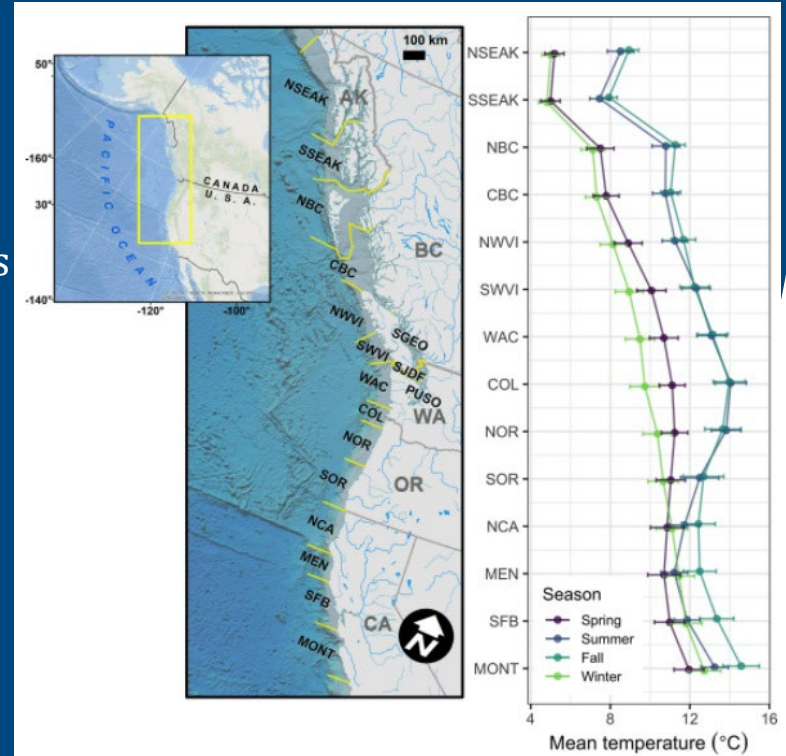
What was updated?

2. Stock-specific ocean distribution parameters

- The Shelton et al. model distribution for Chinook salmon (version 2019)
  - As a reminder the Shelton et al. model distributes individual fall-run Chinook salmon stocks in the ocean spatially and temporally

- As of 2022, new distributions derived from Shelton et al. (2021) are available and are expected to supplant the prior version (2019).

- Covariates were also incorporated into the new model but are not used to calculate the abundance NOF.

From Figure 1, Shelton et. al 2021

What was updated?

During the methodology review process, Dr. Ole Shelton (NWFSC) provided an overview of the differences between the two models to the SSC and STT.

- Shelton et al. version 2021 updated stock distributions better reflect the expected abundance in NOF area, matching other sources of data (e.g., far north migrating stocks like Columbia River Bright stocks are less likely to be present, and since these north migrating stocks are abundant, it results in lower abundances across the dataset in the NOF area)
  - Less abundance is expected in the NOF TS 1 area, both currently and historically. It does not change the considerations for establishing the threshold
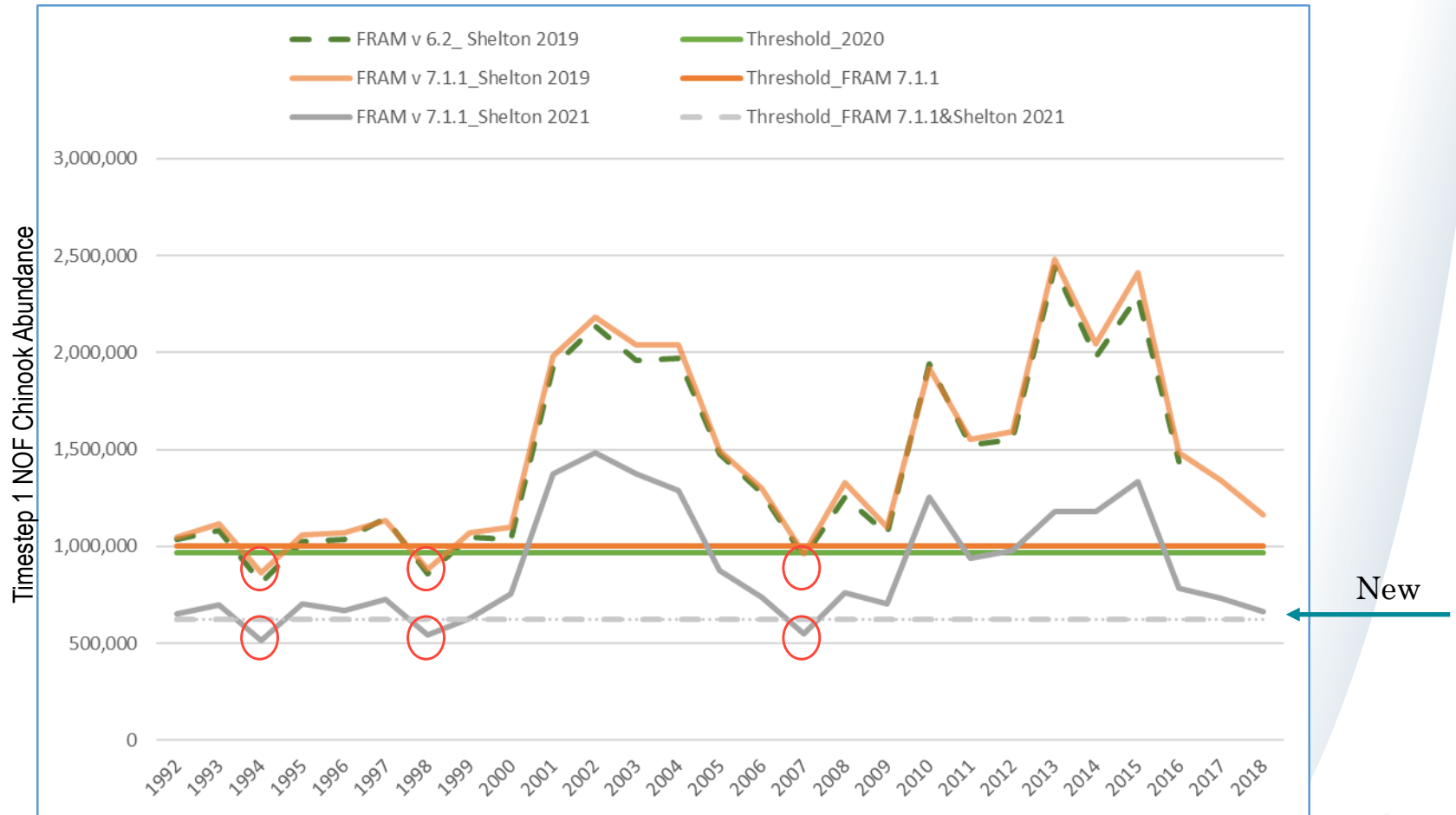 - Reasons include:

Shelton et al. 2019	Shelton et al. 2021
454 CWT groups	1,400 CWT groups
2,100 CWT codes	8,279 CWT codes
1979-1995 recovery years	1979-2015 recovery years

- Updates do not alter the pattern of abundance highs and lows coastwide
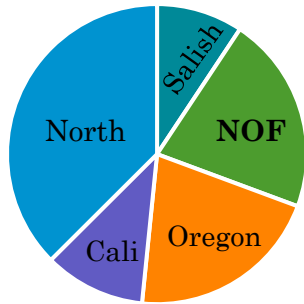
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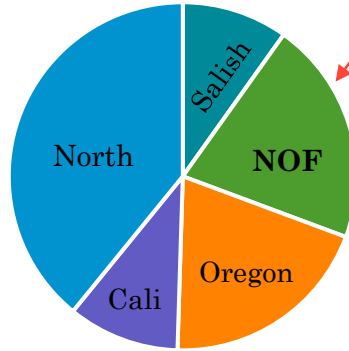# FRAM Updates coupled with Shelton model updates (**NOF only**)
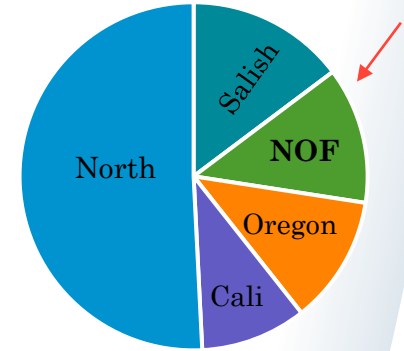
Difference from FRAM vs Shelton models

Round 6.2_2019Shelton

Round 7.1.1_2019Shelton

Round 7.1.1_2021 Shelton

Overall abundance changes slightly (average increase of 5%) but distribution proportions stay the same

Overall abundance unchanged but distributions change

Summary:

➢ **The Council adopted a process (outlined in Section 6.6.8 in the FMP) to incorporate updates to models used to calculate the threshold through a technical review**

➢ **Retaining the same specific years does not change the frequency of a threshold being triggered or the assumptions of the effects to SRKW.**

➢ *Update or not:* During the preseason process, NMFS will request that the Council report the pre-fishing (October 1) adult Chinook salmon abundance based on preseason forecasts for each of the five spatial areas defined by the ad hoc SRKW Workgroup.

QUESTIONS?

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