

PROPOSAL 68

5 AAC 06.361 Nushagak-Mulchatna King Salmon Management Plan, and 06.391 Nushagak District King Salmon Stock of Concern Management Plan.

Adopt an optimal escapement goal for Nushagak River king salmon, as follows:

We recommend that the Board of Fisheries adopt an Optimal Escapement Goal (OEG) for Nushagak River king salmon:

- Biological Escapement Range: 102,530 to 119,882 spawners
- Sonar-Observed Equivalent: 59,467 to 69,532 spawners

These values were derived through a multi-step process:

1. Baseline Reference:

We used the average escapement from 1994–2006 (77,923 spawners) as a realistic rebuilding target. This period represents the last consistent era of Chinook productivity prior to the significant decline that began around 2007.

2. Adjustment for Fecundity Loss:

Research by Ohlberger et al. (2020) and others shows that reductions in size and age have led to a 24–35% decline in egg production per female. We adjusted the baseline escapement by dividing it by (1 - fecundity loss rate), which resulted in:

- 102,530 spawners needed (for 24% loss)
- 119,882 spawners needed (for 35% loss)

3. Correction for Sonar Undercounting:

ADF&G reports that the sonar site in the Nushagak River may undercount king salmon by up to 65%, with an average undercounting rate of ~42%. We applied this correction to the biological OEG estimates to determine what would be needed in sonar-observed escapement:

- 59,467 observed (low-end)
- 69,532 observed (high-end)

This proposal does not seek to change the SEG, which is under ADF&G's jurisdiction. Instead, the OEG would serve as a biologically grounded benchmark to guide management decisions and support realistic, sustainable rebuilding of the Chinook population.

What is the issue you would like the board to address and why? The current escapement management for Nushagak River king salmon is based on outdated size and productivity assumptions from the 1990s. No formal Optimal Escapement Goal (OEG) exists for Chinook in this system, and the existing Sustainable Escapement Goal (SEG) does not account for declines in fish size, fecundity, or sonar undercounting. As a result, rebuilding efforts are hindered by benchmarks that no longer reflect biological realities.

Did you develop your proposal in coordination with others, or with your local Fish and Game Advisory Committee? Explain. Yes. This proposal incorporates peer-reviewed research (e.g., Ohlberger et al. 2020), ADF&G reports, and historical Nushagak Chinook data.

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