Agenda Item E.4.b Supplemental Public Presentation 1 (Enticknap) November 2019

Salmon Fishery Management Southern Resident Orca Consultation

Ben Enticknap November 16, 2019

Photo: John Forde and Jennifer Steven

Southern Resident Killer Whale Population



Fecundity rates have declined: 69% of detectable pregnancies unsuccessful, <u>linked to nutritional</u> <u>stress</u> (Wasser et al. 2017)

Estimated extinction risk of 49% in 100 years under status quo conditions. The estimated SRKW population size was predicted to decline to 75 individuals in a generation (25 years) – already below that.

(Vélez-Espino et al. 2014).

Adapted from Center For Whale Research

Threats

- Lack of prey
- Vessel interactions and noise
- Contamination
- Small population size



Summer 2018, 3-year old Scarlet, or J50, was so emaciated that she lost the fat at the base of her head - what scientists call "peanut head." Declared dead September 13, 2018. *Photo: Katy Foster/NOAA Fisheries Permit No. 18786-03*

Ecology: Foraging Selectivity





Chinook salmon

coho salmon

other salmonids including steelhead

 other fish including flatfish, halibut, and herring

Prey Quality

		# Puget	
	#Average	Sound	
	Chinook	Chinook/	# Sacramento
	/ day	day	Chinook/ day
1 adult			
Southern	12 to 20	17 to 30	10 to 18
Resident (



Over 34 years, between 1975 and 2009, Chinook shrunk on average 20% in weight and 7% in length.

Ecology: Range



Photo: Miles Ritter / Creative Commons



Source: NMFS 2008, SRKW Recovery Plan



"Most of the Chinook prey samples obtained while the whales were in outer coastal waters were determined to have originated from the Columbia River basin."

NMFS 2019 SRKW Critical Habitat
Proposed Rule



Estimated density for K25 and L84 movement tracks. Heat map is scaled to a uniform distribution of habitat use. Dark red values indicate 35x higher than expected by chance.



Photo: NOAA

Hanson et al. 2018.

Quantifying the effects of prey abundance on killer whale reproduction - Ward, Holmes and Balcomb (2009)

"killer whale fecundity is highly correlated with the abundance of Chinook salmon. For example, the probability of a female calving differed by 50% between years of low salmon abundance and high salmon abundance."

Orcas need an ocean abundant with Chinook



Annual indices of mortality of (b) southern resident killer whales and (c) abundance of Chinook salmon, 1979-2003. Deviations from an annual index value of 1 (b) indicate higher or lower than expected mortality rates. Annual indices of Chinook salmon reflect departures from the average abundance over time series.

Ford et al. 2010 – Linking Killer Whale
Survival and Prey Abundance

North of Falcon Chinook Abundance (TS1) and SRKW Mortalities



Orca Need More Salmon Now

- SRKW U.S. recovery goal of 2.3% annual population growth over 28 years implies a 75% increase in energetic requirements. (Williams et al. 2011)
- Reducing salmon fisheries should be considered a precautionary and temporary mitigation measure while longer-term actions to improve salmon productivity take effect.



"Relative importance of chinook salmon abundance on resident killer whale population growth and viability"

Population Viability Analysis scenario: A 51% reduction of ocean harvests rates on 5 large Chinook stocks: West Coast Vancouver Is., Columbia Upriver Bright, Fraser Late, Orgon Coast and Puget Sound.

Result: "Mean stochastic population growth indicated a 1.80% annual increase with a mean expected population size of 166 [SRKW] in 35 years"

(Vélez-Espino et al. 2014)

A precautionary approach is warranted

- Identify and implement a critical Chinook abundance threshold similar in concept to the 'cutoff' factor for forage fish in the CPS FMP.
- Consider time and area closures to avoid competition with Southern Residents.
- Amend salmon FMP with an objective of managing and regulating salmon fisheries in a manner that accounts for the foraging needs of Southern Resident orca.
- Cumulative effects: Consider all sources of ocean fishing mortality; direct harvest and bycatch.

Photo: Rachel Merrett