

Initial Impressions and Responses of the Science Panel to Workshop 1

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Status of Killer Whales

- Information requests
 - Explore the different hypotheses of why the SRKW population is so small
 - How does the density of SRKW compare to the densities of KW in other areas?
 - What are the legacy effects of removals for the aquaria trade?
 - What else is eating Chinook and how much are they eating?

Status of killer whales

- Recommended Analyses
 - Project future population trends based on the current age-sex structure of the population
 - Structured comparison of the demographic parameters of the northern and southern residents, and the relationship between these two populations and other factors, especially Chinook abundance.
 - Compare the relationship between Chinook abundance and birth rates across the two populations

Feeding habits of killer whales

- Information Requests
 - Diet data for SRKW broken down and presented by pods (J, K, and L), age classes (adult males, adult females, and juveniles) and seasons (spring, summer, fall and winter)
- Recommended Analyses
 - Comparison of diets determined from fecal samples and prey remains (scales and tissue).

Fisheries that may affect prey abundance

- Information requests
 - Numerous requests for further FRAM information
- Recommended Analyses
 - Clarifying the differences between CTC and FRAM models
 - Assess interdependencies among fishing, natural, and KW predation mortality using continuous catch equations.
 - Are there alternate approaches to the FRAM model?

Relationship between chinook abundance and KW population dynamics

- Recommended Analyses
 - Examine uncertainty in the independent variables in all estimates of the effects of salmon abundance on killer whale vital rates
 - The legacy effects of past removals for the aquaria trade should be thoroughly explored because changes in demography, rather than forcing from food supply could explain changes in vital rates
 - The population viability analysis should be re-done using a range of acceptable population sizes, not extinction, as outlined under Question 6.
 - Examine population growth rate, λ , as an indicator of recovery in the presence and absence of interventions to modify fisheries, relative to a target growth rate for recovery (λ'), as outlined under Question 6.
 - The analyses above should be done for NRKW and SRKW to explore differences between the two populations.

Chinook needs of SRKW

- Recommended analyses
 - Rerun the models to estimate the energetic costs of pregnancy and lactation

Chinook abundance and food energy available to killer whales

- Information requests
 - More about FRAM
 - Everything available on winter food of KW
- Recommended Analysis
 - Repeat of some earlier requests re FRAM

Reductions in chinook abundance and food energy available to killer whales

- Information requests
 - Can FRAM apply age- and stock-specific maturation probabilities to “global” abundances so as to generate more useful measures of Chinook that might actually be available to SRKW?
 - Other somewhat technical FRAM questions

Reductions in chinook abundance and food energy available to killer whales

- Recommended analyses
 - Consider adoption of a continuous competing risks of death mortality model to better approximate the plausible impact of killer whale predation on Chinook and to better predict the potential increased consumption of Chinook by killer whales if fishing were removed as a cause of death in certain times/areas. Section 4.2 provides some further discussion on how predation by SRKW might be treated.
 - Explore whether age-specific maturation probabilities may be used in FRAM to generate guesses of “inland” Chinook that might be available for pre-terminal marine fisheries and KW ;
 - Fit size selectivity functions to data that more likely reflect the actual abundance of mature individuals from inland populations that might be available for KW

Ratio of chinook food energy available compared to chinook food energy needed by SRKW with and without fishing

- Information requests
 - Please clarify how diet composition (% occurrence) was then translated into predator demand on various prey types that accounts for body size and energy density differences among prey
- Recommended analyses
 - An analysis that assessed the sensitivity of the KW demand calculations to the assumption that KW's are at metabolic equilibrium
 - a comparison between the SRKW bioenergetics model and feeding rates of KW in captivity

Change in KW population growth rates annually, abundance over time and species survival and recovery

- Information requests
 - More FRAM info
- Recommended Analyses
 - Bayesian posterior distributions of SRKW population growth rates