Body condition of Southern Resident killer whales, fall 2021 to spring 2022

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Sample Data. The body condition of 51 different Southern Resident killer whale (SRKW) individuals was measured from vertical drone photographs (Durban et al. 2015) in the fall-spring 2021-2022, specifically between November 5th 2021 and April 10th 2022. This comprised all 25 members of J-pod, including the new calf (J59) born in February 2022, and 26/33 whales from L pod. A further six members of L pod were last imaged in September 2021 along with all 16/16 members of K pod. Our sample therefore included 73/74 whales known to be alive between September 2021 and April 2022; only absent was L89 who was missing from the L12 group when we last imaged them in January 2022.

Identifying whales in "poor" body condition. Using the image measurements and statistical analyses detailed in Stewart et al. (2021), we identified whales in "poor condition" as those estimated to be in the lowest body condition state BC1. These were whales for which the measured eye patch ratio (EPR, a sensitive proxy for body condition; Fearnbach et al. 2020) at the time of their most recent photograph had a residual difference to the EPR expected for their age that fell into the lowest 20% of residuals for measurements from the comparable November-May period from 2016-2022. The expectation was calculated by fitting generalized additive models of EPR against age, separately for each sex, to data available from the November-May period from 2016-2022. For whales imaged most recently in September 2021, the expected EPR and residual distributions were estimated from data available from the comparable September period from 2008, 2013 and 2015-2021. We have documented whales in BC1 to have an elevated probability of subsequent mortality compared to those in more robust states BC2-5 (Stewart el al. 2021).

There were 12 whales in BC1 state from J and L pods, including one calf (C), one adult male (M), five adult females (F), one juvenile (J) and four sub-adult males (S):

J27(M), J36(F), J44(S), J49(J), J56(C), L54(F). L83(F), L90(F), L94(F), L110(S), L116(S), L117(S)

This includes six whales that were measured to be in BC1 in both September 2021 and fall-spring 2022, plus an additional L pod female (L94) that was not imaged in September. Additionally, there were four whales which have declined into poor condition since September and are now listed as BC1 (J27, J44, J49, L90). L54 was not imaged in the fall-spring 2022 period, but is on the list because she was measured to be BC1 when last imaged in September 2021. No K pod whales were imaged in the fall-spring 2022 period, but none were measured to be in BC1 in September 2021 when all were imaged.

References
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