

Methods and statistics behind the final proposed marine mammal viewing/swimming permit amendments in Akaroa Harbour

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Purpose

1. The purpose of this report is to summarise:
 - a) The method undertaken by the Department to reach the final proposed permit amendments, and,
 - b) statistics that help to understand some of the possible impacts of the amendments on dolphin protection objectives, and on the operators.

Initial proposed permit amendments

2. Informal discussions that the Department held with each individual operator in November and December 2023 were used to generate ideas for the initial proposed amendments.
3. The objectives of the initial proposed amendments were to ensure: 1) The total allocated permits were reduced to no more than the science-informed maximum of 20 cumulative trips per day over the busiest months of the year (December, January and February); and 2) each operator would make a fair contribution to the reduction in effort based on their individual business context.
4. The maximum limit of 20 cumulative trips per day is important because University of Otago research¹ found clear displacement of Hector's dolphin from preferred habitat in Akaroa Harbour on days when daily cumulative trips exceeded that level. Some evidence of dolphin displacement was also seen when cumulative trips exceeded 12 per day, which is therefore considered the preferred daily limit.
1. The primary focus was on achieving the necessary reductions through removal of un-used allocations of permitted trips. However, consideration was also given to a) maintaining or decreasing the proportion of trips seeking to swim with dolphins versus view them; and b) restricting the operational area in each permit to the area actively used by the operator (as another mechanism for reducing allocations within Akaroa Harbour).
5. We used actual trip data collected from the onboard trackers (i.e. activity returns) for the pre-COVID period (2019/2020) and from the most recent year (2023/2024), as well as any data provided directly by the operators, to help inform proposed changes.
6. The actual trip data were compared against existing daily permit levels and different scenarios of permit level changes in simple, adjustable models. Model outputs allowed for objective assessment/validation of how each scenario of permit amendment would have impacted both cumulative and individual operator effort in both the pre-COVID summer of 2019/20 and the full year of 2023/24.

¹Rayment, W.J.; Bennington, S.; Carome, W.; Dillingham, P.; Slooten, E.; Wickman, L.; Dawson, S.M. 2024: Long- and short-term impacts of vessels on Hector's dolphins at Te Pātaka-o-Rākaihautū / Banks Peninsula. DOC Research and Development Series 372. Wellington: Department of Conservation.

7. When it was determined that the initial proposed permit amendments were in line with the objectives, each permit holder was sent the proposed amendments for their permit and feedback was formally requested.

Final proposed permit amendments

8. To guide the final proposed permit amendments, the Department considered operator feedback on the initial proposed permit amendments and identified four key decision-making principles. Those principles were as follows:
 - a. No more than 20 trips per day, and limited to 12 trips per day as a preference
 - b. Giving effect to the Principles of the Treaty of Waitangi
 - c. Natural justice, and
 - d. No increases for any operator beyond their existing, allocated, trip numbers for any given day/month.
9. In terms of natural justice, all operators were expected to contribute to lowering the cumulative allocation of trips. However, it was also recognised that every operator's history and business context was unique, and that blanket approaches could not be fairly applied.
10. To determine appropriate individual contributions to the cumulative allocation, we used the adjustable models that were created using actual operator trip data from 2019/20 and 2023/24 as a decision support tool. The models helped objectively assess, and then balance when possible, the impact of any permit amendments on each operator's: a) actual permit usage; b) market share; and c) potential for future growth in trip numbers.
11. The Department used the decision support tool to model numerous permit amendment scenarios (including adoption of all operator feedback) before arriving at the final proposed amendments.
12. It was not possible to adopt all operator feedback and stay true to the principles laid out above. However, it was possible to incorporate some feedback from most permit holders.
13. The two models (2019/20 and 2023/24) – based on both the initial and final proposed amendments – can be accessed via the links in Appendix 1. Key outputs/statistics from the final proposed amendments are summarised with associated graphs and tables below.

Statistical summary of final proposed permit amendments

Impact on actual operator trips

14. Under the final proposed amendments, the Department believes that the cumulative daily permitted trips remain in line with the research findings that triggered the amendment process.
15. There would be no days when the cumulative daily permitted trips are able to exceed 20, and for 183 days on a leap year (6 months) permitted daily trips will not exceed the preferred level of 12 as recommended by the science (Table 2).

Table 2. Number of days across a full leap year when combined operator daily permit levels are: equal or less than the preferred level (green); between the preferred level and the maximum level (yellow); or over the maximum level (red). Existing permit levels are shown alongside the proposed final permit amendment levels and the actual 2023/24 data.

Cumulative daily trips	Existing permit level	Final proposed amendment	Actual 2023/24 operator effort
<=12	92	183	334
13-20	61	183	32
>20	213	0	0
Total days (leap year)	366	366	366

16. Daily operator effort did not cumulatively exceed 20 trips per day in 2023/24, when our data suggests daily trips remained below pre-COVID levels for all operators. Although the cumulative picture does not always show the individual operator picture, it does demonstrate that the impact on actual summer 2023/24 trips would have been very low.
17. Based on summer 2019/20 data (December, January and February 2019/20), if the proposed permit amendments had been in place they would have prevented daily operator trips from cumulatively exceeding 20 on only 12 days (Table 3). Moreover, the model estimates that the proposed permit amendments would have impacted no more than 6% of any one individual operator's actual, total trips, across that three-month period.

Table 3. Number of days across December, January and February (leap year) when combined operator daily permit levels are: equal or less than the preferred level (green); between the preferred level and the maximum level (yellow); or over the maximum level (red). Existing permit levels are shown alongside the proposed final permit amendment levels and the actual data from December 2019 and January and February 2020.

Cumulative daily trips	Existing permit level	Final proposed amendment	Actual 2019/20 operator summer effort
<=12	0	0	12
13-20	0	91	67
>20	91	0	12
Total days (leap year)	91	91	91

Impact on growth in operator trips

18. If the final proposed permit amendment scenario had been in place in the summer of 2019/20, the model estimates that the majority of operators would have been reaching their daily limits on 75-90% of days. However, although limits may be reached frequently on the busiest days of the year (particularly prior to COVID), all operators retain considerable potential for growth at other times of year.

19. For instance, it is estimated that each operator would have a large number of unused trips – 19-64% depending on the operator – if the proposed amendments had been in place in 2023/24. The industry's cumulative, unused, allocation of trips (53-54%), estimated based on actual 2023/24 trip data, is demonstrated by the gap between the green line and the yellow line in Figure 1.

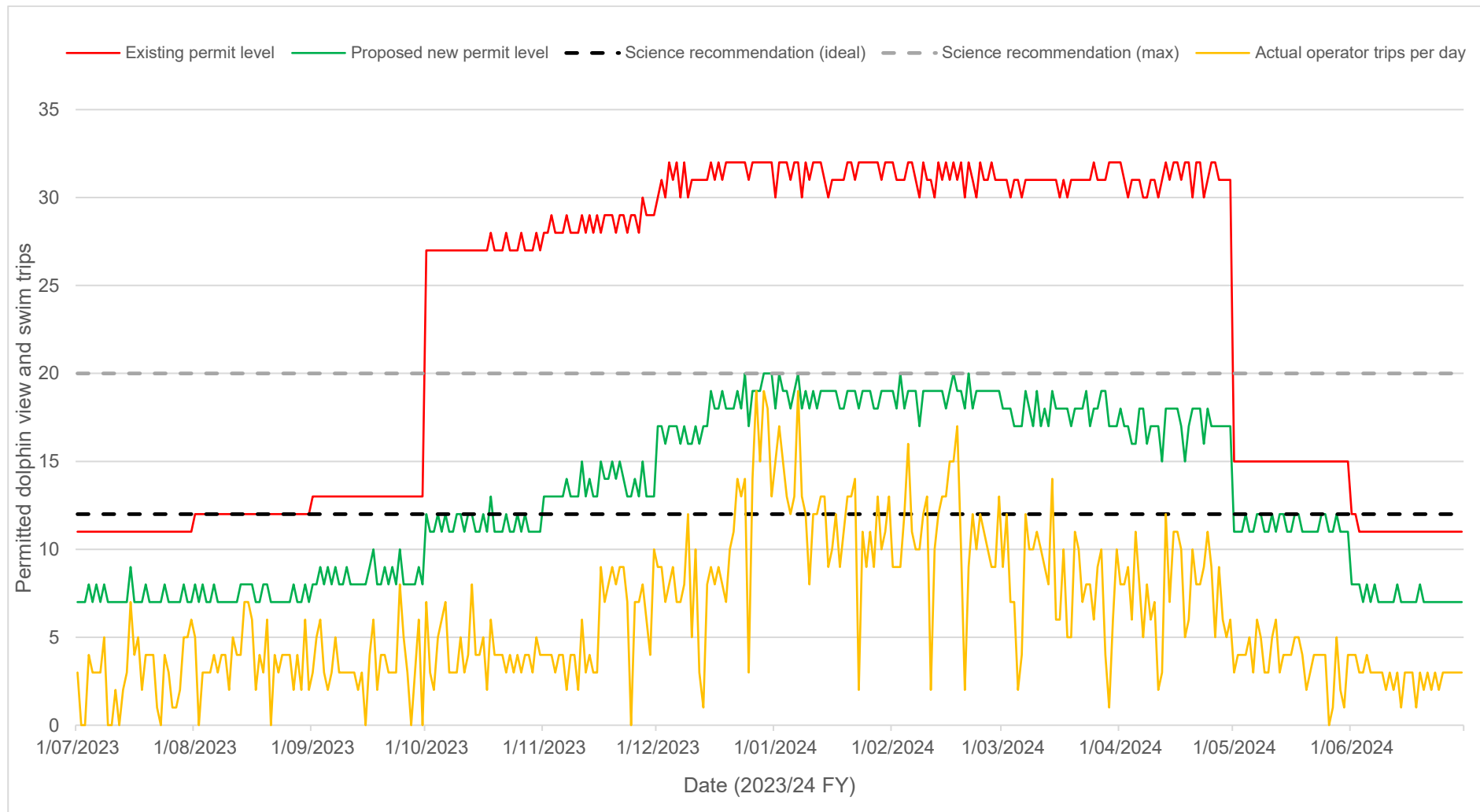


Figure 1. The red line shows the existing number of permitted trips across all operators combined for a full year from 1 July until 30 June. The green line shows the equivalent number of trips under the final proposed permit amendment, and the yellow line estimates the equivalent actual number of trips carried out across the 2023/24 financial year. The recommended research levels of 20 trips per day maximum and 12 trips per day preferred are shown as grey and black dotted lines respectively.

Impact on market share

20. The existing market share of the operators that remain permitted to operate in Akaroa Harbour is largely retained under the final proposed permit amendment scenario (Table 4).

21. s9(2)(b)(ii)

22. s9(2)(b)(ii)

Table 4. Market share (%) of the total permit allocation (across a full leap year) that each operator currently holds within the Akaroa Harbour operational area and how that would change under the proposed final permit amendments.

Market share	Akaroa dolphins	Black Cat	Fox II Sailing	Hamilton/ Gehrig	Ōnuku Inc. Society	Pōhatu Penguins
Existing (%)	s9(2)(b)(ii)					
Proposed (%)						

Impact of separating Pōhatu Marine Reserve from the operational area

23. The final proposed permit amendments retain the separation of Pōhatu Marine Reserve from the wider operational area, albeit with an allowance for some educational visits.

24. Separating Pōhatu Marine Reserve means one operator is prepared to relinquish Akaroa Harbour from their permitted area, helping achieve the primary purpose of lowering the maximum cumulative permitted trips to less than 20 within Akaroa Harbour.

25. Under this proposal it is also considered that there is an additional conservation benefit because Pōhatu Marine Reserve will be used primarily by non-motorised commercial vessels, retaining a quieter zone for Hector's dolphins close to Akaroa Harbour.

26. Analyses of operator track data from the 2023/24 year shows that the change is likely to have minimal impact on operators. Over 2000 trips were completed across all permitted, motorised commercial vessels in 2023/24, and track data suggests less than 20 (<1%) of these visited Pōhatu Marine Reserve.

Data and model caveats

27. The models and associated statistics detailed above are estimated based on real-world vessel tracking data and are not expected to be 100% accurate in all instances. Nonetheless, the outputs are likely indicative of overall trends and actual numbers.

28. Actual daily operator trip data was derived from designated GPS tracking units that are carried by each Akaroa marine mammal permit holder. The accuracy of GPS-derived trip data had been

validated at >90% accuracy using a selection of operator-recorded data provided to DOC ([DOC-10355448](#)). Despite a high, general accuracy, it should be noted that in some circumstances there will be overestimates of actual operator trips for 2023/24 because non-marine mammal viewing trips (e.g. if the vessel is used for another purpose) were not filtered from the data.

29. Data was also missing for one permit holder during a six-week period between 05/10/2023 and 14/11/2023, which may have been when the trackers were removed for servicing. To stand in place of the missing data, in one of the models we used their vessel trips from the six weeks immediately prior, which may underestimate true effort for that specific period.
30. Both existing and proposed cumulative permit levels include permit holders that have monthly and/or seasonal limits alongside daily limits, which is why there is variability in the red and green lines seen in Figure 1.
31. It is not possible to know which days any given operator would choose to use one of their monthly/seasonal quotas of trips. For the purposes of the model, it has been assigned to periods when higher demand would be most likely – i.e., weekends and holidays. Any extra days beyond that were randomly assigned to weekdays.
32. Overall, we do not expect any of these caveats to have had a significant impact on data trends or any associated decision-making. Despite some sources of potential error, we consider the model robust enough to have served its purpose as a decision support and validation tool.

Appendix 1

Permit amendment scenario	Summer 2019/20 model	Full financial year 2023/24 model	Outputs from models
Initial proposed permit amendments	DOC-10356229	DOC-10356230	DOC-10356261
Final proposed permit amendments	DOC-10415826	DOC-10415808	DOC-10415832