Appendix E – Chloe Corne – Marine mammals

Before the Fast-track Panel

Under: The Fast-track Approvals Act 2024

In the matter of: FTA313 - Beachlands South

Statement of advice

Chloe Corne

Marine Mammals

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15/10/2026

Department of Conservation
Te Papa Atawhai

Te Kāwanatanga o Aotearoa
New Zealand Government

Introduction

1. My full name is Chloe Corne.

Instruction

2. I have been instructed to provide expert advice on behalf of DOC on the Beachlands South – Fast-track application, in relation to marine mammals.

Qualifications and Experience

3. I am a Technical Advisor in the Marine Species team at the Department of Conservation (DOC). I have been in the Technical Advisor role since June 2025 and provide advice under the Fast Track Approvals Act (2024), Resource Management Act (1991) and Marine Mammals Protection Act (1978) for avoiding or mitigating impacts on marine mammals. I have been employed by DOC since 2014; prior to my current role I was the Project Lead for marine mammal conservation programmes in Fiordland.

4. My role in relation to the Beachlands South Fast Track project has been to provide expert advice on marine mammal effects on behalf of the Department of Conservation.

5. I hold a Master of Science (with Distinction) in Marine Science from the University of Otago, graduating in 2024. My MSc research focussed on spatiotemporal distribution and habitat modelling for humpback whales in the Fiordland Marine Area using GIS, underwater acoustics and statistical modelling software.

6. I have fifteen years' experience in marine mammal research, fieldwork and conservation management in New Zealand and abroad.

Code of conduct

7. Whilst it is acknowledged this is not an Environment Court proceeding, I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. I have complied with the Code of Conduct in the preparation of this advice. Unless I state otherwise, this assessment is within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of advice and expert opinion

8. My expert advice will address the following matters:

9. A brief description of marine mammal species occurrence.

10. The potential effects of the proposed activity on cetaceans.

11. The adequacy of proposed management and mitigation measures.

Sources

12. In preparing this advice I have reviewed:

    i. Attachment 13B: Jackson, S & Tupe, M. (2026). BSLP Fast Track Application – Marine ecological impact assessment. Tonkin & Taylor Ltd.

    ii. Attachment 18: Hegley, R. (2026). Assessment of noise and vibration effects. Report No 26032v2. Hegley Acoustic Consultants.

iii. Attachment 18A: Hegley, R. (2026). Draft construction noise and vibration management plan. Report No. 26032 DCNVMP. Hegley Acoustic Consultants.

Executive Summary

13. The proposed Beachlands South development includes construction of a coffer dam for a marine wastewater outfall within the Whitford Embayment, an area used by a range of marine mammal species, including several classified as Threatened.

14. While the embayment does not appear to constitute critical habitat for any marine mammal species, marine mammals occur within the area and may be exposed to project-related effects, principally underwater noise generated during piling, followed by elevated risk of vessel strike or disturbance.

15. Although the application proposes a number of positive mitigation measures, the underwater noise assessment for the cofferdam construction relies on thresholds for permanent auditory injury rather than temporary threshold shifts (TTS) in hearing sensitivity. Mitigation should instead be designed around TTS thresholds, which provide a more precautionary basis for managing marine mammal effects. Uncertainty also remains regarding the underwater noise levels likely to be generated and therefore whether the proposed marine mammal management zones are appropriately sized.

16. Underwater noise and vessel strike risks can be adequately managed through consent conditions and implementation of a targeted Marine Mammal Management Plan (MMMP), rather than incorporating some mitigation into the Construction Noise & Vibration Management Plan as currently proposed. Such a plan should include marine mammal observation protocols, shutdown and restart procedures, verification monitoring of underwater noise levels, adaptive management provisions, requirements relating to the effective performance of any acoustic bubble curtain, and vessel operating procedures to minimise the risk of vessel strike.

General

Clarification of application information on marine mammals

17. The Department of Conservation's marine mammal databases contain 3,594 live marine mammal sighting records and 280 strandings or entanglement records in the inner Hauraki Gulf. Altogether, thirty-one species have been recorded in the Zone of Interest (ZOI) defined by Jackson & Tupe (2026) as landward of a line running between Whangaparoa directly East to the Coromandel.

18. Based on the available data, the Whitford Embayment does not appear to constitute critical habitat for any particular species of marine mammal. However, there are multiple records of marine mammal sightings, including Threatened species, within the embayment and along the adjacent coastline, indicating at least occasional use of the area.

19. The Department's marine mammal databases are comprised of opportunistic sighting and stranding records and thus should be considered indicative rather than a comprehensive representation of species occurrence, regular distribution patterns or critical habitats. Notwithstanding the published research for Bryde's whales, common dolphins and bottlenose dolphins in the Hauraki Gulf (e.g., Dwyer et al., 2016), these data limitations increase uncertainty when assessing potential impacts on marine mammals and their habitat, rather than indicating an absence of risk.
20. This advice is based on the updated marine mammal threat classifications published under the New Zealand Threat Classification System by Lundquist et al. (2025), superseding the Baker et al. (2019) assessment referenced by Jackson & Tupe (2026). Any differences between the threat classifications referred to in this advice, and those reported by Jackson & Tupe (2026) are likely to reflect the use of the updated Lundquist et al. (2025) assessment.

Marine mammal conservation values

21. All marine mammal species are granted protection in accordance with the Marine Mammals Protection Act 1978.
22. The New Zealand Coastal Policy Statement (2010) requires avoiding adverse effects on indigenous species listed as Threatened or At-Risk under the New Zealand Threat Classification System (Policy 11(a)(i)) and on species listed as threatened by the IUCN (Policy 11(a)(ii)).
23. The Department of Conservation's primary concerns are species that are Threatened under the NZ Threat Classification System or the IUCN. However, any risk to a non-Threatened species is likely to pose similar risks to Threatened species; further, species classified as 'Data deficient' may in fact be biologically threatened. It is therefore appropriate to manage risks associated with marine infrastructure construction for all marine mammals.
24. Several Threatened species have been recorded in the inner Hauraki Gulf and may therefore occur within or transit through the project area, these being: Bryde's whales (Nationally Critical), orca (Nationally Critical), bottlenose dolphins (Nationally Vulnerable), Hector's dolphins (Nationally Vulnerable), southern right whales (Nationally Increasing), and humpback whales from the Oceania breeding population (IUCN - Endangered). The Department's databases contain records of orca, Bryde's whale, and southern right whales in or close to the Whitford Embayment, and the area is within modelled preferred coastal habitat for bottlenose dolphins (Stephenson et al., 2023).

S53 Matters specific advice

25. The principal risk posed by this project to marine mammals is underwater noise generated during installation and removal of sheet piles associated with construction of the temporary cofferdam for the marine outfall, described in Attachment 18 (Hegley, 2026a). Vessel strike is also a risk that should be managed. These risks can be managed by a Marine Mammal Management Plan and vessel operating procedures.

Underwater noise

26. The impacts of underwater noise on marine mammals can include permanent auditory injury and temporary threshold shifts (TTS). TTS is a temporary reduction in hearing sensitivity following exposure to elevated noise levels, from which hearing is expected to recover over time. Comparatively, permanent auditory injury represents permanent hearing loss or irreversible reduction in hearing sensitivity. Other impacts of underwater noise include acoustic masking, which results in reduced listening space in which marine mammals can communicate, navigate and locate prey, behavioural change, and habitat avoidance.

27. The amount of underwater noise produced during piling varies depending on methodology and materials used. For example, the amount of noise radiated from the source is higher during percussive pile driving of large diameter steel piles compared to vibro-piling using smaller diameter wooden piles. This application is proposing to use a combination of percussive and vibro-pile driving on sheet piles, though it is not specified whether the sheet piles will be steel, wood, or another material.

28. In the absence of New Zealand standards for underwater noise, we rely on international best practice guidelines. The relevant guidelines are the 2024 update of the Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine mammal Hearing (version 3.0): Underwater and In-Air Criteria for the Onset of Auditory Injury and Temporary Threshold Shifts from the US Department of Commerce National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS, 2024).

29. Of primary concern is that the underwater acoustic assessment (Hegley, 2026a) uses the NMFS (2024) criteria for auditory injury as the basis for proposed mitigation of underwater noise. Auditory injury, as defined in NMFS (2024), is permanent and is therefore a high-effect threshold. In my opinion it is not appropriate to assess the adequacy of mitigation against the onset of auditory injury. Projects for which marine mammal effects are a relevant consenting consideration commonly adopt mitigation measures designed to avoid or minimise the risk of TTS, which represents a precautionary benchmark for assessing hearing-related effects.

30. Therefore, I consider it appropriate that underwater noise mitigation measures be designed to avoid exceeding the TTS for the Very High Frequency (VHF) cetacean hearing group. At 144 dB SEL for impulsive noise sources, this is the most conservative underwater TSS criterion within the NMFS (2024) framework and therefore provides a precautionary approach for managing underwater noise effects across the full range of marine mammal species that may occur in the project area, with one possible exception (discussed below).

31. Pinnipeds recorded in the Hauraki Gulf include leopard seals (phocids) and NZ fur seals (otariids). Leopard seals are occasionally present in the inner Hauraki Gulf and have been recorded hauled out on beaches and infrastructure with little regard to nearby activity. Whilst using a mitigation threshold of 144 dB SEL will be sufficient to protect both phocids and otariids when they are under the water, the in-air thresholds

for the onset of TTS in phocids and otariids exposed to impulsive noise are 125 dB SEL and 148 dB SEL respectively (NMFS, 2024). Any management measures should include procedures to mitigate impacts where pinnipeds are present within areas where the relevant threshold is predicted or measured to be exceeded, whether hauled out on land or surfacing nearby.

32. Notwithstanding the comments above regarding appropriate underwater noise thresholds, the application contains several positive mitigation measures intended to reduce underwater noise effects. These include the selection of outfall construction methodologies that minimise noise generation during piling, such as the use of a sacrificial piling dolly to cushion the impact between hammer and pile, consideration of an acoustic bubble curtain to disrupt underwater sound propagation (discussed further below), and implementation of pre-start observations and stop work protocols when marine mammals are detected within defined management zones (Hegley, 2026a; 2026b).

33. However, it remains unclear whether underwater noise modelling or measurements have been undertaken that are representative of the methods and materials proposed for the project. It is also unclear whether any such assessments incorporated the use of a sacrificial dolly and/or an acoustic bubble curtain. Consequently, the appropriateness of the proposed marine mammal management zones cannot be independently verified from the information currently available. In my opinion, underwater noise levels should be validated through field measurements during construction, with the results used to confirm or refine mitigation measures through an adaptive management framework.

34. Bubble curtains have the potential to significantly reduce underwater noise generated during piling activities by creating a continuous barrier of air bubbles around the noise source, thereby attenuating sound transmission through the water column. However, their effectiveness is highly dependent on site-specific factors (Dähne et al., 2017; Würsig et al., 2000), including bubble size and density, water depth, currents, the distance between the bubble curtain and the pile, and the continuity of the bubble curtain from the seabed to the water surface.

35. Accordingly, if a bubble curtain is proposed as a mitigation measure it should be deployed by or in consultation with a suitably qualified specialist, and their effectiveness should not be assumed. Verification monitoring would be needed to confirm that the system is achieving the intended reduction in underwater noise levels and that mitigation zones remain appropriate. Provision should also be made for adaptive management, including modification of the bubble curtain design or implementation of additional mitigation measures where monitoring demonstrates that noise reduction performance is less effective than predicted.

Vessel strike

36. Construction activities are likely to increase vessel movements within the project area, including support vessels, barges and other marine plant associated with outfall installation and related works. Increased vessel activity may elevate the risk of vessel strike and disturbance to marine mammals, particularly where animals are travelling through or foraging within the Whitford Embayment and adjacent coastal waters. While

the overall risk is likely to be manageable, appropriate vessel operating procedures are required to minimise potential effects.

Effects management

37. These risks can be managed through a targeted Marine Mammal Management Plan (MMMP), which should be prepared by a suitably qualified and experienced practitioner (SQEP) and implemented through consent conditions. Currently, underwater noise mitigation measures are incorporated in the draft Construction Noise & Vibration Management Plan (CNVMP; Hegley, 2026b).
38. A MMMP should identify responsibilities for implementation, monitoring and reporting, describe marine mammal observer qualifications and training requirements, establish pre-start, operational, shutdown and restart procedures, and specify marine mammal observation zones (MMOZ) derived from verified underwater noise measurements.
39. In my opinion, it is simpler in practice for a MMMP to have only one size for a MMOZ, rather than multiple MMOZs based on different marine mammal hearing sensitivity groups as is currently proposed in the CNVMP. The effectiveness of having multiple zones would depend heavily on the marine mammal observer(s) being able to accurately identify species and its corresponding hearing group from the appropriate distance, and to do so promptly enough for mitigation measures, such as cessation of piling, to be employed.
40. Noise management should prioritise the best practicable options to avoid or minimise noise at the source. Bubble curtain specifications, if being used, should be included in the MMMP. In addition to the measures proposed in the acoustic assessment (Hegley, 2026a), the MMMP should require verification monitoring, adaptive management provisions, and clearly defined trigger levels for management responses where measured noise levels exceed predicted levels.
41. The MMMP should also include procedures for adaptive management responses where measured noise exceeds predictions, and incident reporting requirements.
42. Construction-related vessel activity should also be managed through vessel operating procedures consistent with the Marine Mammals Protection Regulations 1992. Procedures should address vessel speed, marine mammal observation requirements, avoidance measures, and actions to be taken when marine mammals are observed in the vicinity of construction activities.

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