Before the Fast-track Panel

Under: Fast-track Approvals Act 2024

In the matter of: FTAA-2511-1150- Bream Bay Sand Extraction

Statement of advice: Name: Jochen Zaeschmar

Area of expertise: Marine mammal ecology

Independent consultant

Date: 21 May 2026

Department of Conservation
Te Papa Atawhai

Te Kāwanatanga o Aotearoa
New Zealand Government

Introduction

1. My full name is Jochen Reinhard Zaeschmar.

Instruction

2. I have been requested to provide expert advice on behalf of the Department of Conservation (DOC) on the Bream Bay Sand Extraction Project Fast-Track Application by McCallum Bros Limited.

3. Specifically, I have been asked to comment on the effects of the proposed sand extraction activity by McCallum Bros Limited on marine mammals in Te Ākau/Bream Bay.

Qualification and Experience

4. I am an independent Environmental Consultant working from my office in Paihia, Bay of Islands. I have a National Vocational Diploma in Environmental Conservation (1998), from Plumpton College, United Kingdom, a Postgraduate Diploma in Conservation Biology (2014) and a Master of Science in Conservation Biology from Massey University (2015). I have 20 years of experience studying marine mammal ecology. I am the chair of the Far Out Ocean Research Collective (since 2017) a trust dedicated to the study of northern New Zealand's marine habitat with particular focus on marine mammals.

5. I have a good understanding of the subject matter and the proposed Project site.

   Work that is especially relevant to this application includes:

   i. Baseline surveys of marine megafauna in Te Ākau/Bream Bay to support kaitiakitanga, Vision Mātauranga project. 2022-2024. An MBIE funded collaboration between NIWA, Patuharakeke and the Far Out Ocean Research Collective (Brough et al. 2024a, Brough et al. 2025).

   ii. Update on the population and spatial ecology of bottlenose dolphins in the Bay of Islands. 2024. A Department of Conservation funded project to

conduct bottlenose dolphin surveys in the Bay of Islands and collate various data sets, spanning 30 years, into a cohesive database (Brough et al. 2024b, Brough et al under review).

iii. The northern New Zealand Bryde's Whale Project (2010 to date). This long-term project focusses on the occurrence, distribution and site-fidelity of Bryde's whales off Northland's east coast with particular focus on the waters off North Cape and Bream Bay. The project is a collaboration with Ngāti Kuri, Patuharakeke and the University of Auckland (Cranswick et al. 2025).

iv. The NZ Oceanic Bottlenose Dolphin Project (2005 to date). This long-term project assesses social structure, population size and overlap with the nationally critical coastal ecotype of bottlenose dolphin (Zaeschmar et al. 2021, Zaeschmar et al. 2014, Zaeschmar et al. 2013).

v. The NZ False Killer Whale Project. This ongoing project is the first study of the species in NZ and one of only two dedicated species-specific studies worldwide. Current research projects include false killer whale genetics in collaboration with the University of Auckland as well as ongoing research on social structure, habitat use and function of the observed inter-specific associations (Zaeschmar et al. 2014, Zaeschmar et al. 2013).

vi. The NZ Pilot Whale Project (2011 to date). This long-term project assesses occurrence, site-fidelity, habitat use and inter-specific associations of pilot whales in northern New Zealand waters (Meyer et al. 2024).

Code of conduct

6. 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 advice 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

7. My expert advice relates to the following in relation to marine mammals:

   i. Adequacy of the Applicant's assessment of the proposed sand extraction activities, including identification of any values that have not been assessed or have been insufficiently characterised.

   ii. Adequacy of the Applicant's assessment of effects on marine mammals with specific reference to any effects that are incomplete, understated, or not addressed.

   iii. Adequacy of the Applicant's proposed mitigation, rehabilitation and management measures.

   iv. Alternative mitigation or management approaches, where appropriate, including my recommended or preferred measures where these differ from those proposed by the Applicant.

   v. Comments on conditions.

Material Considered

8. In preparing this advice I have reviewed the following documents as part of the substantive application:

   i. Te Ākau Bream Bay Sand Extraction Project - Resource Consent and Wildlife Approval Applications and Assessment of Effects under the Fast-track Approvals Act 2024.

   ii. Attachment 11 - Assessment of Underwater Noise Effects (Styles Group).

   iii. Attachment 14 - Assessment of Marine Mammals Effects (SLR).

iv. Attachment 28 - Marine Mammal Management Plan (MMMP).

v. Attachment 29 - Environmental Monitoring Management Plan (EMMP).

9. I am very familiar with the site and have conducted marine megafauna surveys in Te Ākau/Bream Bay on many occasions over the last 15 years.

Summary

10. McCallum Bros Ltd. (the Applicant) present a substantive application for the proposed extraction of sand from the seabed ('the Project') in a 15.4 km^2 sand extraction area ('the Area') at Te Ākau/Bream Bay over a 35-year period. Sand will be extracted using a motorised trailing suction hopper dredge.

11. There are two proposed stages of intensity: Stage 1.; an annual sand extraction volume of up to 150,000 m^3 for at least the first three years from the commencement of the consent, and Stage 2.; an annual sand extraction volume of up to 250,000 m^3 for the remaining period of the consent. Sand extraction will be limited to a maximum of 3.5 hours during daylight hours on any given day and will occur up to an average of 5 times per week when the Stage 2 sand extraction volume comes into effect.

12. The Applicant has produced a series of impact and risk assessments of the proposed activity on the Area and its flora and fauna. Regarding the potential impacts on marine mammals, the Applicant produced an assessment drawn from a review of the available literature, marine mammal sighting databases, and acoustic and limited visual monitoring data collected on behalf of the Applicant.

13. Eight potential impacts are identified: underwater noise, habitat modification, ship strike, exposure to contaminants, marine debris, entanglement, artificial lighting and cumulative impacts. Impacts are weighted according to their magnitude and likelihood, with possible effect levels ranging from negligible to significant, and potential mitigation measures are presented.

14. The Applicant acknowledges the significance of the Area to marine mammals, noting the high levels of marine mammal diversity (at least 34 species

documented to date), and further recognizes the potential impacts on regularly occurring endangered species, in particular coastal bottlenose dolphins and Bryde's whales.

15. Overall, this is a comprehensive assessment that acknowledges the presence of a wide range of marine mammals, including significant numbers of vulnerable and endangered species such as Bryde's whales, killer whales and coastal bottlenose dolphins in the Area. Further, the assessment acknowledges potential impacts and identifies disturbance from underwater noise as the main concern. However, it concludes that impact levels of acoustic disturbance are low and that overall impact levels range from low to a net gain/positive (in the case of marine debris) due to the relatively low sound levels emitted, the limited hours of operation and the fact that affected species do not use the proposed extraction site or the wider area exclusively and may already be habituated to similar impacts.

16. My main criticism is that some of the identified impacts are likely greater than presented, if additional factors are taken into account. Consequently, the displacement of at least some individuals, in particular bottlenose dolphins, cannot be ruled out. I address these points in more detail below.

Key Issues

17. Clarification of application information on marine mammals, addressing each of the potential impacts outlined by the Applicant.

General

18. Eight potential impacts are identified (underwater noise, habitat modification, ship strike, exposure to contaminants, marine debris, entanglement, artificial lighting and cumulative impacts). I agree that this is an exhaustive list of potential impacts.

19. A total of 34 marine mammal species are listed as potentially present, with seven species (bottlenose dolphins, common dolphins, Bryde's whales, false killer whales, pilot whales, killer whales, and New Zealand fur seals) identified as having a regular presence in the Area. I agree with the species listed but given the

proposed timeframe of the Project, recovering species, in particular humpback whales and southern right whales, should be categorised as species likely to be present in the Area.

Underwater noise

20. Acoustic monitoring of the Area was carried out over 51 days in May and June 2024 by Styles Group. Results show that delphinids were detected on 72% of deployment days (37 out of 51 days), with detection duration lasting up to 5.5 hours. Bottlenose dolphins were identified as the most commonly detected species.
21. Baleen whales were detected on 16 of the 51 deployment days (31% of days), with the vast majority of detections (15 out of 51 days) attributed to Bryde's whales, and the remaining single day detection attributed to Sei whales. Acoustic detections were slightly biased towards daylight hours.
22. Filtering of the data set was applied to include only detections of a duration of >1 minute to reduce the risk of false positives (other sounds that could be mistaken for dolphin detections).
23. Acoustic modelling is applied, with acoustic thresholds set for each species to identify the level of risk for the following impacts: 1. physiological damage, 2. auditory masking, 3. behavioural impacts and 4. simple audibility. Behavioural responses in cetaceans were calculated using dose-response functions, following Southall et al. (2021).

<u>Underwater noise impact assessment evaluation</u>

Physiological damage

24. The risk of physiological damage is considered non-existent beyond a distance of 0.5 m from the extraction vessel whilst it is extracting sand (Attachment 11, Section 5.1.1). I agree with this assessment.

Auditory masking

25. The potential for auditory masking (a reduced ability to detect biologically important sounds because other noise overlaps with them) caused by the Project was assessed from the Applicant's own soundscape recordings of the Area in May and June 2024 (Attachment 11, Section 5.5). Masking effects for

baleen whales may occur from as far as 16.2 km from the extraction activity but are considered negligible at that distance. Masking effects of 50% listening space reduction may occur at a distance of 2.8 km. For pinnipeds, the range for 50% listening space reduction was calculated at 2.02-2.66 km.

26. For delphinids, small masking effects were predicted to occur within 933 m and medium-level masking effects could occur within 170 m from the extraction activity. I agree with this assessment.

Behavioural impacts

27. The possibility of small behavioural responses is predicted for baleen whales (including Bryde's whales) at up to 1,115 m from the vessel when actively extracting (Attachment 11, Section 5.1.2). Small behavioural responses could be possible within 596 m for delphinids and 700 m for pinnipeds. The possibility of medium level behavioural responses in pinnipeds and delphinids is predicted to occur within 203 m and 227 m, respectively, from the extraction activity.
28. There was insufficient data to accurately assess the likelihood of medium level responses in baleen whales, but it is expected to occur in a significantly smaller radius from the extraction activity than the 1,115 m calculated for a small behavioural response (Attachment 11, Section 5.1.2). I agree with this assessment.

Audibility

29. Audibility (the ability of a marine mammal to hear the extraction activity), was calculated at 18.6 – 18.9 km for pinnipeds, 18 km for baleen whales and 10.4 km for delphinids (Attachment 11, Section 5.1.4).

Key concerns

The assessment identifies underwater noise to represent the most severe impact on marine mammals. I agree with the methodology applied and the impacts identified. I disagree with some of the premises presented and conclusions drawn. My key concerns are:

Filtering and limited timeframe of acoustic monitoring data.

30. The decision to omit acoustic detections of <1 minute (Attachment 14, Section 3.2.1) is potentially problematic as it generates the risk of omitting individuals/species that are known to vocalize infrequently such as killer whales and will also under-represent critical behavioural states like resting. The limitation is acknowledged and described as necessary to minimise the risk of false positives. Consequently, the number of detections included in the analysis reflects the minimum level of delphinid presence, with actual numbers likely higher than stated. Importantly, the need for this filtering arose primarily because of the very large number of delphinid detections recorded (*n* = 26,129) which in itself shows the high level of delphinid occurrence in the Area.
31. Additionally, the limited temporal scope of the acoustic data collection may under-represent the presence of some species Attachment 14, Section 3.2.1). For example, Brough et al. (2024a, 2025) found seasonal peaks in occurrence for both Bryde's whales and bottlenose dolphins, with both species observed more frequently in warmer months. Seasonal peaks in inshore occurrence during warmer months have been previously documented for bottlenose dolphins, Bryde's whales and other species in the region (Hartel 2010, Wiseman et al. 2011, Dwyer et al. 2020). Given, that acoustic monitoring was only carried out in winter, it is likely that detections of these species will be even greater during warmer months.

Extraction site location

32. Dredging activity has been linked to the temporary displacement of bottlenose dolphins (Pirotta et al. 2013) while other studies found no significant behavioural response (Bossley et al. 2022). The discrepancy may be linked to differences in the availability of nearby undisturbed habitat that can act as a refuge (Bejder et al. 2006, Southall et al. 2021). The Area constitutes some of the least disturbed habitats in Te Ākau /Bream Bay. Indeed, the locations of the deployment sites for the soundscape-measuring devices in the southern area of Te Ākau/Bream Bay were selected because they are furthest from the shipping channels and are predicted to have the lowest levels of existing anthropogenic noise sources, further highlighting the importance of the Area as undisturbed habitat

(Attachment 29, Section 7.2). Consequently, it is of concern that the proposed activity is to be undertaken in a relatively undisturbed part of Te Ākau/Bream Bay. This is also relevant considering the existing anthropogenic impacts for species such as bottlenose dolphins and Bryde's whales in other hotspots across their range, including Te Pēwhairangi /Bay of Islands and Tipaka Moana/Hauraki Gulf.

Large home ranges/highly mobile nature of affected marine mammal species.

33. It is further stated that any effects of acoustic impacts will be temporary due to the highly mobile nature of the marine mammal species known to be present in the Area (Attachment 14, Section 4.2.1). This conclusion disregards the fact that marine mammals do not use their home ranges evenly and that occurrence may be linked to specific behaviours. For example, critical behaviours like resting and foraging in bottlenose dolphins typically occur in different areas (Hartel 2010). Consequently, species are likely to spend more time in areas important for critical behaviour. As stated previously, the very high number of acoustic detections strongly suggests that the Area constitutes important habitat. Indeed, bottlenose dolphins have been shown to forage extensively in the Area (Brough et al. 2024a, 2025), a critical behaviour that is linked to hotspots in occurrence (Hastie et al. 2014). The Applicant's own monitoring data further shows that bottlenose dolphins may spend extended periods of time within the Area, with continuous acoustic detections of >5 hours recorded (Attachment 14, Section 3.2.1). While all potentially present species have the ability to evade the Area, these data suggest that doing so would result in displacement from a biologically important area.
34. Similarly, it is stated that the Area represents only a small part of the home ranges of any marine mammal species likely to occur there (Attachment 14, Sections 3.3, 4.2.1, 4.2.6, 4.3, 4.4, 4.5,). Whilst true, it needs to be considered that species do not occur across their home ranges at the same frequency or density. For example, while the north-eastern New Zealand population of bottlenose dolphins is known to occur across a range spanning from East Cape to the Manukau Harbour, there are clear hotspots for the species within this region and not all individuals frequent the entire range. Indeed, there is ample evidence to show that even within these hotspots, site-fidelity is highly

dependent on individual preferences, with many so-called core users documented in the respective hotspots within their range (Berghan et al. 2008). In the case of Te Ākau, photo-identification results show clear site fidelity, with both short- and long-term presence confirming the existence of core users in the Area, while the frequency of sightings and/or the number of individuals identified qualifies the Area as a hotspot for several species (Brough et al. 2024a, 2025).

35. Site fidelity of Bryde's whales has also been documented albeit at lower levels compared to bottlenose dolphins, likely owing to the comparatively smaller number of individuals photo identified (Far Out, unpublished data). For both species, Te Ākau represents one of only a few known core habitats within their range off north-eastern New Zealand. Further, both species face stressors in other parts of their ranges that have led to localised declines in abundance such as reduced prey availability for Bryde's whales in Tikapa Moana/Hauraki Gulf (Cranswick et al. 2024) and vessel disturbance of bottlenose dolphins in Te Pēwhairangi/Bay of Islands (Brough et al. 2024b). The Area is also known as an important foraging area for false killer whales. While Te Ākau only represents a small fraction of their range, it is one of only a few places worldwide where this species can regularly be observed close to shore. Consequently, the impacts of further degradation of an area known as critical habitat for several marine mammal species needs to be addressed and incorporated into the assessment.

Habituation of present marine mammal species to anthropogenic stressors.

36. The assessment stipulates that species in the Area have been facing persistent exposure to anthropogenic stressors for a long time and are therefore already habituated to these impacts and will consequently not be greatly affected by the Project (Attachment 14, Sections 4.2.6 & 4.9). While this is supported by some studies (New et al. 2013), it appears to be highly context dependent and requires careful consideration of cumulative impacts (Southall et al. 2021, Erbe et al. 2023). There is sufficient evidence to show that responses to stressors vary not only between species but also among individuals, age classes and sexes. Further, individuals are known to tolerate anthropogenic impacts, even if doing so may result in reduced fitness, if the costs are outweighed by the benefits of biological factors (i.e. good foraging conditions, Pirotta et al. 2015). Additionally,

stressors are more likely to be tolerated if undisturbed habitat is available in the vicinity (Southall et al. 2021).

37. The assessment indicates that displacement of marine mammals, in particular bottlenose dolphins, cannot be ruled out (Attachment 14, Section 4.2). Consequently, I disagree with the conclusion that the impacts of underwater noise are negligible to low.

Habitat modification

38. Habitat modification caused by sand extraction or dredging has been linked to the displacement of delphinids (He at al. 2025), with both direct and indirect effects recognized as stressors. Direct effects such as increased turbidity generated by the sediment plume are temporary and may lead to short-term localised displacement. Indirect effects such as changes to the benthic habitat and resulting changes in prey communities can have long-term effects on marine mammals (including long-term displacement) and are consequently of greater concern.

39. The assessment concludes that habitat modification is expected to be negligible for marine mammals (but low for bottlenose dolphins) and that any resulting impacts on marine mammals are also negligible to low, citing *no statistically significant differences in benthic fauna between sand extraction and control stations* at the Pakiri extraction site as a case in point (Attachment 14, Section 4.3). It is further stated (Attachment 14, Section 4.3.2) that affected marine mammals:

    i. are able to evade the Area.
    ii. are not solely dependent on the Area for foraging.
    iii. have home ranges larger than the Area.
    iv. are already subjected to the effects of dredging activity in and around Northport.
    v. do not practice benthic foraging exclusively.
    vi. will not significantly be affected by changes in prey availability.

40. Consequently, no mitigation measures are proposed.

41. Impacts of the Project on prey communities higher in the water column and its effects on predator/prey assemblages are not assessed. While these are presumed to be low to moderate, no data are presented (Attachment 14, Section 4.3).

42. My concerns are that whilst it is correct that all marine mammals likely to be encountered in the sand extraction area are highly mobile and able to move away from poorer quality habitat created by the Project, potential displacement is a bona fide risk.

43. While home ranges of all species likely to be present in the sand extraction area are greater than the area and no marine mammal species is solely dependent on the area for foraging, the significance of the area to marine mammals (especially bottlenose dolphins) is not sufficiently addressed (see also Paragraphs 34 & 35).

44. It is correct that marine mammals (in particular bottlenose dolphins and killer whales) in Te Ākau /Bream Bay are already affected by dredging activity within and around Northport. However, it is important to emphasize that the proposed Area constitutes higher quality habitat that is currently subjected to significantly fewer anthropogenic stressors (see also Paragraph 37).

45. It is incorrect that no marine mammal species occurring in the area practices benthic foraging. Benthic foraging is the primary foraging method of New Zealand killer whales (Visser 2007). However, while they regularly occur in Te Ākau /Bream Bay and have been documented to forage there, they typically do not appear to spend extended periods of time in the sand extraction area or vicinity.

46. Reductions in the availability of preferred prey in the sand extraction area would result in degradation of an area that currently constitutes important habitat for marine mammals, in particular bottlenose dolphins.

47. The potential adverse effects of habitat modification are one of the key components of the cumulative impacts generated by the Project.

48. Displacement of marine mammals, in particular that of bottlenose dolphins, is a potential effect of habitat modification caused by the Project. Consequently, I disagree that the overall effects are negligible or low.

Ship strike

49. The risk of ship strike is considered minimal mainly due to the slow travel speed (<10 knots) of the extraction vessel and the slow working speed (<3 knots) while extracting sand (Attachment 14, Section 4.4). Some mitigation measures (continuous lookout while travelling) are also proposed. I agree that the risk of ship strike is minor.

Exposure to contaminants

50. The risk of adverse effects on marine mammals from exposure to contaminants is deemed negligible based primarily on the low levels of contaminants measured in the sediment and the extraction method Attachment 14, Section 4.5). I agree that the risk is minimal.

Marine debris

51. Adverse effects on marine mammals due to marine debris associated with the sand extraction are stated as negligible (Attachment 14, Section 4.6.2). In fact, a net gain is stated since any marine debris collected during the extraction process will not be returned into the sea thereby further reducing the risk of adverse effects. I agree that the risk of adverse effects of marine debris associated with the operation is minimal. Technically speaking, the collection of marine debris constitutes a net gain. However, this will be offset by the potential for debris generated on the boat to make its way into the water. While good mitigation measures are in place, it is safe to assume that over a 35-year period some debris from the boat (i.e. plastic bags, food wrappers, cigarette butts etc.) will end up in the water.
52. Consequently, I disagree with the assessment of net gain but agree that the effects are negligible.

Entanglement

53. The risk of entanglement is considered negligible due to the lack of any loose lines or other equipment that could lead to entanglement and the slow operating speed (Attachment 14, Section 4.7.2). Additionally, mitigation measures are proposed, including a 100-meter exclusion zone around the dredge vessel and draghead for large whales (Attachment 14, Section 4.7.1). I agree with the assessment but recommend the inclusion of additional species in the exclusion zone (see below for details).

Artificial lighting

54. Given that the Project is proposed for daylight hours only, and that no excessive lighting is necessary during travel, artificial lighting is not considered to have any significant impact (Attachment 14, Section 4.8.2). However, the proposed hours of operation (1200 – 1800 between April and September, and 1200 -2000 between October and March), suggest that a small part of the sand extraction may occur after nightfall. While the impact from artificial lighting would be minor in this case, the associated underwater noise of the extraction process after nightfall needs to be considered. Given the greater likelihood of critical resting behaviour by bottlenose dolphins and Bryde's whales at night, continuing sand extraction operations after dark could potentially increase the level of impact.

Cumulative impacts

55. The difficulty of accurately assessing the level of cumulative impacts is acknowledged whilst highlighting the level of existing stressors and degradation (Attachment 14, Section 4.9). It is concluded that the overall level of cumulative impacts ranges from negligible to low (Attachment 14, Section 4.9.2).
56. At the same time, it is conceded that '*given the individual variability in sensitivity to disturbance, it is possible (but unlikely) that some individuals* [bottlenose dolphins] *could be displaced on account of cumulative underwater noise' (Attachment 14, Section 4.9)*.

I agree with the assessment that acoustic disturbance may potentially lead to the displacement of some individual bottlenose dolphins. Consequently, I disagree with the assessment that effects on marine mammals, in particular the local bottlenose dolphin population will be minor. I also consider it plausible that the effects of underwater noise on Bryde's whales may be greater than stated. My concerns are:

Cumulative effects on bottlenose dolphins

57. Individuals exhibiting the strongest site-fidelity will be at the greatest risk of the effects of cumulative impacts. This is particularly relevant for bottlenose dolphins. The assessment acknowledges the importance of Te Ākau/Bream Bay for the species, including the large number of individuals and high levels of site-fidelity documented.
58. However, it is argued that the high rate of occurrence of bottlenose dolphins in zones of high shipping traffic within Te Ākau/Bream Bay (i.e. the Perry Channel) indicates that individuals are habituated to underwater noise and are therefore less susceptible to its impacts[1]. But a similar trend has been observed in Te Pēwhairangi/Bay of Islands where remaining individuals spend disproportionate amounts of time in areas of high vessel traffic (Brough et al. 2024b). Given the significant and ongoing population decline in Te Pēwhairangi/Bay of Islands this behaviour should not be considered as evidence that vessel disturbance has no significant population level effects. Rather, it appears that a subset of individuals has adapted to the stressors while the majority has been displaced. Indeed, there is mounting evidence that vessel related stressors are driving displacement in the population although it remains inconclusive if vessel presence or the associated noise are the primary factor (Erbe et al. 2025). Despite continued low-level presence in Te Pēwhairangi/Bay of Islands, the population there cannot be described as healthy.

[1] Attachment 14, Section 4.9, p.91: *Indeed, the highest probabilities of occurrence for bottlenose dolphins in Te Ākau Bream Bay (see Figure 14) overlap with Parry Channel. This suggests that at least some bottlenose dolphins that occur in and around Te Ākau Bream Bay are tolerant of underwater noise and that habituation to sand extraction activities in Te Ākau Bream Bay is probable.*

59. Additionally, there is no data to inform on the population trends of any marine mammal species in Te Ākau/Bream Bay. Consequently, it cannot be assumed that displacement is not already occurring or that it has not occurred in the past. If it is taking place, it is plausible to assume that more individuals may face some level of displacement when subjected to additional stressors. It is also worth noting that the original abundance of certain species in Te Ākau/Bream Bay would have been significantly greater in the past (i.e. southern right whales, humpback whales). From a sustainability perspective, it is desirable to facilitate conditions that will enable restoration of habitat rather than further degradation. Further, as noted above, it needs to be emphasized that the waters inshore of the proposed Area are relatively undisturbed. Compromising more suitable marine mammal habitat increases the risk of displacement, especially for bottlenose dolphins in this case.
60. It is stated that bottlenose dolphins from the declining Te Pēwhairangi/Bay of Islands population do not appear to have moved to Te Ākau/Bream Bay in response to increasing disturbance, with only around 6% of individuals (*n* = 37) documented in Te Ākau/Bream Bay also observed in the Te Pēwhairangi/Bay of Islands (Brough et al. 2024a, Brough et al. 2024b, Brough et al. 2025)[2]. However, this proportion is based on the entire number of dolphins ever identified in Te Pēwhairangi/Bay of Islands (*n* = 540). When compared to the number of individuals identified in Te Ākau/Bream Bay (*n* = 149), it is apparent that a significantly larger proportion (26%) of these individuals are connected to Te Pēwhairangi/Bay of Islands and may have experienced previous displacement.
61. At the same time, given the stark decline of the Te Pēwhairangi/Bay of Islands population, with no clear understanding of the fate of most of the displaced individuals, it cannot be assumed that individuals that are subjected to excessive stressors simply move to adjacent more suitable habitat or are not compromised in their fitness. Consequently, further degradation of Te

[2] Attachment 14, Section 4.9, p.91: *While it is possible that bottlenose dolphins displaced from the Bay of Islands could be attracted to nearby alternative habitat such as Te Ākau Bream Bay, photo-identification data does not strongly support this possibility; with only a small proportion (37 individuals or 6%) of the total number of recognisable individual dolphins (540) being observed in both locations (Brough et al., 2025)*.

Ākau/Bream Bay has the potential to cause additional displacement, home range reduction and overall population decline.

Cumulative effects on Bryde's whales

62. It is stated that that Bryde's whales are unlikely to be adversely affected by the proposed activity due to documented low levels of site-fidelity (Tezanos-Pinto et al. 2017)[3]. This is only partially correct. While the majority of Bryde's whales in the Tikapa Moana/Hauraki Gulf exhibit low levels of site fidelity, some individuals show long-term site fidelity. Site fidelity has also been shown in the Te Ākau/Bream Bay area (Far Out, unpublished data). Additionally, changes in the prey community are thought to currently drive changes in Bryde's whale habitat use. The high sighting rate of Bryde's whales in Te Ākau/Bream Bay highlights its importance as a foraging ground.
63. Further, the Applicant's own acoustic data shows that the sand extraction area and vicinity constitute important habitat for baleen whales, in particular Bryde's whales (Attachment 11, Figure 12 & Table pp. 49-51). The finding challenges the Applicant's statement that the sand extraction area does not represent typical Bryde's whale habitat, with the species usually found in deeper waters or farther offshore. Rather, it shows the variability in the species' occurrence according to suitable foraging areas.

Mitigation

General

Several mitigation measures are presented and discussed. Most of these are standard maritime safety measures that are not specific to the Project, such as avoidance of ship strike, entanglement and pollution. Two of the proposed

[3] Attachment 14, Section 4, p.54: *While masking of some Bryde's whale calls is probable within Te Ākau Bream Bay, there is evidence to suggest that site fidelity of Bryde's whales to coastal northeastern New Zealand is generally low (Tezanos-Pinto et al., 2017) with an unstable mixture of individuals that are both frequently and infrequently sighted over time (Hamilton et al., 2023). This is indicative of a population that is sparsely distributed over a wide home range; hence the potential for individuals to be subject to underwater noise impacts on a repetitive basis is presumably also low.*

mitigation measures (soundscape monitoring and marine mammal monitoring) are of particular relevance.

Soundscape change monitoring

64. Changes in soundscape measurements are important as they provide a strong metric to assess the impacts of underwater noise. Baseline data, collected prior to the Project's commencement is crucial to accurately measure the acoustic impact of the Project.
65. Soundscape change monitoring will be carried out to ensure that the proposed activity does not exceed underwater noise level increases of >3 dB re 1 µPa over any calendar month. Data will be collected for two six-month periods both before and after the commencement of the extraction activity, respectively (described as *with Project/without Project* measurements). If increases above this threshold are identified, mitigation measures will have to be applied, with both physical (attempts to reduce operating noise) and management measures (reduction of operating duration) given as possible responses.

66. I am concerned that the application states '[i]*t is possible that consent may be granted, and extraction could commence in advance of the 'without Project' measurements being available for the same six-month period. If that situation arises, there would be no 'without Project' measurement data collected for the same calendar months in which extraction could commence' (*Attachment 29, Section 7.5, Point 5).
67. I strongly recommend that the proposed six-month *without Project* measurements are completed prior to the commencement of the Project.

Marine mammal monitoring

68. A dedicated Marine Mammal Management Plan (MMMP) has been developed. Continuous marine mammal monitoring by the vessel crew is proposed, with the main mitigation measure, specific to the Project, being the implementation of a 100-metre exclusion zone around the dredge vessel and draghead for large whales (including killer whales) during the extraction process (Attachment 29, Section 6.0). Additionally, marine mammal sightings will be collected by the

crew and passed on to DOC and mana whenua for informational purposes (Attachment 29, Section 6.0).

69. Support for a more comprehensive marine mammal monitoring programme is mentioned. It is stated that '[b]e*cause of the declining population trend for threatened bottlenose dolphins in the Bay of Islands, a cautious approach is warranted, and a monitoring programme will be implemented if consent is granted'* (Attachment 14, Section 4.2.8). It is also stated that [McCallum Bros Limited] *'recognises the value of the data that was collected through this programme'* [by third party research groups for marine mammal research surveys in Te Ākau Bream Bay] *and 'will, on a case-by-case basis, consider potential research projects and offer to contribute financially to the continuation of marine mammal surveys in Te Ākau Bream Bay'* (Attachment 28, Section 12.0), Further details are not provided. It is further mentioned that independent boat-based marine mammal monitoring can be conducted by the Patuharakeke Te Iwi Trust Board and financed from the cultural contribution proposed under Condition 44 (Main Application Document, Section 7.17).
70. My concerns are that the proposed continuous marine mammal monitoring by the extraction vessel crew shows several limitations. The main concern is that the detection of marine mammals relies entirely on the working crew of the extraction vessel who may be inexperienced at detecting marine mammals and may not be able to carry out continuous monitoring due to operating requirements. Additionally, there is little incentive for crew to detect marine mammals.
71. There does not appear to be any real commitment towards more comprehensive marine mammal monitoring, with somewhat diverging and conflicting statements found in the documents. A dedicated, independent marine mammal monitoring programme would present a significant opportunity to actively and adaptively manage an activity whose impacts are still not well understood. In its present wording, the consent condition will not lead to effective marine mammal monitoring or adaptive management of potential impacts on marine mammals.

Conclusions

72. The Applicant presents a comprehensive assessment of the potential impacts of the proposed sand extraction activity on marine mammals at Te Ākau/Bream Bay. Both the range of possible impacts and affected species are identified adequately. The large diversity of species, the levels of site-fidelity documented in some threatened species and the resulting significance of Te Ākau/Bream Bay to marine mammals are recognized. The assessment concludes that impacts of the Project are primarily minor, with the possibility of some low-level effects caused by underwater noise and to a lesser extent habitat modification. In particular, behavioural responses to underwater noise by bottlenose dolphins (and to a lesser extent Bryde's whales) are considered to be the most significant impact of the Project.
73. There are some concerns regarding the scope and the potential consequences of the identified impacts. The Project presents various risks due to its long duration (35 years), the conservation status of the species affected, the documented site-fidelity and presence of critical behaviours and critical life stages, the sand extraction area's high-quality habitat, and the likelihood of acoustic and cumulative impacts.
74. The importance of the sand extraction area and its vicinity to marine mammals has been established by previous studies and is further highlighted by the Applicant's own data presented, with some aspects of the data collection and analysis suggesting that actual marine mammal presence is likely even greater than stated. Consequently, it appears likely that underwater noise and habitat modification impacts could be greater than presented in the assessment and the possibility of displacement of an unknown number of individuals (in particular bottlenose dolphins) cannot be ruled out.
75. Considering the protective marine mammal measures currently in place in the nearby Te Pēwhairangi Marine Mammal Sanctuary, (in response to local declines of bottlenose dolphins), subjecting members of the same metapopulation to comparable stressors that are thought to have driven the decline there needs to be reflected.
76. Additionally, in its present form, there is no explicit or binding requirement for comprehensive marine mammal monitoring to assess the impacts of the Project

once it commences apart from initial soundscape measurements and basic on-board presence/absence observations by the vessel crew.

77. The long-term impacts of anthropogenic stressors on marine mammals remain difficult to quantify as they can be highly species and context dependant. Consequently, there remains a reasonable level of uncertainty when trying to predict likely consequences. However, the impacts assessed herein, especially those of underwater noise and habitat modification are widely recognized as having significant effects on marine mammals and have been linked to population declines elsewhere. When considered in combination, the resulting cumulative impacts are known to intensify the effects of these stressors. Considering all the available material, the possibility of displacement of at least some individuals, especially of bottlenose dolphins cannot be ruled out. I therefore recommend a precautionary approach.

Recommendations

78. A fine scale assessment of marine mammal demographics in the sand extraction area andTe Ākau/Bream Bay, including habitat use, site-fidelity and abundance of marine mammals is lacking and greatly needed to produce a robust risk-assessment for the proposed activity. Adequate monitoring is also crucial to enable adaptive and responsive risk management. To enable a meaningful assessment of the long-term effects of the Project, it is important that baseline data is collected prior to the commencement of the Project, followed by further fine scale behavioural monitoring of the Te Ākau/Bream Bay marine mammal community to detect any early signs of adverse impact. Consequently, marine mammal monitoring should be incorporated as a prerequisite into the adaptive management system.
79. I recommend that the six-month *without Project* soundscape measurements are completed prior to the commencement of the Project to ensure the generation of baseline data against which changes can be measured.
80. The acoustic monitoring data already collected for the Applicant could be used to quantify spatial and temporal aspects of foraging activity within and around the sand extraction area.

81. Given the increased potential for the disturbance of resting behaviour at night, I recommend that sand extraction ceases before sunset to minimise the impacts of underwater noise at this time.
82. Given the duration of the Project, recovering species like southern right whales and humpback whales should be included in the list of species likely to be present.
83. False killer whales and pilot whales should be included in the list of species within the proposed 100 m exclusion zone.

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