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: Chris Gaskin

Area of expertise: Seabird ecology

Independent consultant

Date: 26 May 2026

Department of Conservation
Te Papa Atawhai

Te Kāwanatanga o Aotearoa
New Zealand Government

Introduction

1. My full name is Christopher Paul Gaskin

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.

Qualification and Experience

3. I am an independent Environmental Consultant based at Ti Point, Auckland. I am a trustee for the Northern New Zealand Seabird Charitable Trust, an organisation I founded in 2015 to faciliate seabird research, advocacy and education. I have 20 years' experience working with seabirds, including project managing seabird/island surveys/research expeditions for northern New Zealand (including Kermadec Island Islands); also undertaking advocacy for seabirds and the environments they inhabit. From 2013 to 2015 I was the project coordinator for Important Bird and Biodiversity Area (IBA) Programme for New Zealand seabirds, contracted to BirdLife International (through Forest & Bird, BirdLife's New Zealand partner). I completed a comprehensive inventory of significant seabird sites throughout New Zealand to create the IBAs. I have been lead-investigator in a series of contracts with the New Zealand Department of Conservation (DOC), Conservation Services Programme (CSP) including investigating the feeding associations of seabirds (fish schools, cetaceans), population trends, indirect effects from fisheries, and the study of the effects of light attraction on seabirds, all for northern New Zealand seabirds. I am the lead author for Ministry for Primary Industries (MPI)'s best practices and technologies available to minimise and mitigate the interactions between finfish open ocean aquaculture and seabirds. I was lead author for the preparation of the Pacific Seabirds Survey and Monitoring manual for the Secretariat of the Pacific Regional Environment Programme (SPREP), and also co-authored the Seabird Action Plan in the Pacific Regional Marine Species Programme 2022-2026 (SPREP).

4. I have a good understanding of the seabirds of the Te Ākau Bream Bay and the east Northland marine areas. My work that is especially relevant to this application includes:

   i. Identifying Important Bird & Biodiversity Areas (IBA) for New Zealand seabirds (includes shorebirds); includes eight globally important sites in the wider Hauraki Gulf region (all now recognised as Key Biodiversity Sites (KBA)).
   ii. Procellariiformes associating with shoaling fish schools – northern New Zealand (DOC CSP2016)
   iii. Indirect effects on seabirds in northern North Island (DOC POP2017-06)
      a. Identified the range of potential seabird prey species within fish workups
      b. Identified food fed to chicks of key surface feeding seabirds
      c. Compared prey availability in fish workups with the diet of the target seabird species
      d. Collected baseline population data on surface and burrow nesting seabirds
   iv. Fish shoal dynamics in north-eastern North Island (DOC CSP POP2019-02, BCBC2020-08)
   v. Lighting adjustments to mitigate against deck strikes/vessel impacts (DOC CSP MIT2019-03)

   NB: The scope of contracts iii and iv encompassed the outer Hauraki Gulf, including zooplankton sampling and seabird observations conducted within Bream Bay on many of the survey trips.

Code of conduct

5. 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

6. My expert advice relates to the following:

i. Adequacy of the Applicant's assessment of seabird habitat use and values of the proposed extraction site, and wider Te Ākau Bream Bay, 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 seabirds 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 recommended or preferred measures where these differ from those proposed by the Applicant.

v. Comments on conditions.

Material Considered

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

   i. Attachment Thirteen - Assessment of Seabirds and Shorebirds Effects (NIWA)

   ii. Attachment Twenty-Seven - Sand Extraction Operation Plan (SEOP)

   iii. Attachment Twenty-Nine - Environmental Monitoring Management Plan (EMMP)

   iv. Attachment Thirty-Three - Oil Spill Contingency Plan (OSCP)

Summary

8. 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 area at Te Ākau/Bream Bay ('the area') over a 35-year period. It is proposed that sand will be extracted using a motorised trailing suction hopper dredge.

9. 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.

10. Sand extraction is proposed to be limited to a maximum of 3.5 hours during daylight hours on any given day and up to an average of 5 times per week when the Stage 2 sand extraction volume comes into effect.

11. The Applicant has produced a series of impact and risk assessments of the proposed activity on the area and its flora and fauna.

Seabirds

12. Regarding the potential impacts on seabirds, Dr Thompson (NIWA) produced an assessment on behalf of the Applicant.

13. In assessing potential effects on avifauna including seabirds, Dr Thompson lists eight effects (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, Section 3):

    i. Loss of terrestrial breeding habitat
    ii. Exclusion from marine habitat
    iii. Changes to prey abundance/availability
    iv. Interaction with the sand extraction vessel
    v. Fuel/oil spill
    vi. Airborne noise
    vii. Underwater noise.

13. I agree that these are relevant effects to be considered.

14. Dr Thompson acknowledges the importance of Te Ākau Bream Bay for seabirds and presents a 'conservative' total of 34 seabird taxa, of which five are classified as 'Threatened' under the current (2021) New Zealand Threat Classification System (NZTCS) and a further 23 taxa classified as 'At Risk', as likely to occur in the Te Ākau Bream Bay area. Overall, 82% of seabird taxa likely to occur in Te Ākau Bream Bay are classified as either 'Threatened' or 'At Risk' (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 13).

15. I agree that this list represents seabird taxa that could occur in the Te Ākau Bream Bay area. However, no differentiation is made between taxa that are resident and locally breeding, migratory species that are locally breeding, and taxa that breed outside the region. Nor is there an assessment made on likelihood of occurrence. I broadly agree with the Applicant's assessment with respect to effects on seabirds. However, by not differentiating taxa as above, I

believe that Dr Thompson has underestimated the importance of Te Ākau Bream Bay for some key locally breeding 'At Risk' species. This and other related issues will be addressed in more detail below.

Key Issues

16. **Loss of terrestrial breeding habitat** for avifauna Dr Thompson focusses on tara iti New Zealand fairy tern (Threatened – Nationally Critical) and potential effect on the Waipū Estuary and shorebird habitat. Effects on tara iti are addressed in Dr Beauchamp's evidence for DOC (Appendix B to the section 53 report).

17. Although not covered by Dr Thompson there is unlikely to be any loss of terrestrial breeding habitat in the many other seabird breeding locations in the vicinity of Te Ākau Bream Bay, i.e., on Taranga (Hen), Marotere (Chickens), and Bream Islands, and Sail Rock as a result of the dredging operations.

18. **Exclusion from at-sea habitat**, Dr Thompson states: 'It is possible that some seabird taxa will be excluded from the proposed sand extraction area through the presence of the extraction vessel, potentially removing access to preferred habitat, or preventing seabirds from foraging efficiently within the extraction area. This would be a significant issue if the proposed extraction area was relatively important for a particular species, either because a seabird relied on prey that was only available at that site or if the area was a significant proportion of the foraging range of a particular seabird (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 18).

19. Dr Thompson noted he was 'unaware of any scientific evidence in support of either of these two scenarios. All species of seabirds that occur in the Te Ākau Bream Bay area exhibit relatively large distributions and have the potential to forage over relatively large areas'. He uses the example of tītī / Cook's petrel with its wide-ranging foraging distribution arguing it would seem reasonable to conclude that even complete exclusion from the proposed extraction area would have a **negligible** effect on this species (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 19).

20. I agree that Dr Thompson's example of tītī Cook's petrel has a wide-ranging foraging distribution; in fact, this species, while potentially, but not commonly occurring in Te Ākau Bream Bay, forage well offshore in pelagic waters (i.e., Tasman Basin, Challenger Plateau, Lord Howe Rise, Hikurangi Trough and Hikurangi Plateau) (Rayner et.al. 2008). Similarly, tītī Pycroft's petrel and ōi grey-faced petrel, while breeding on islands in the vicinity of Te Ākau Bream Bay, are also predominantly pelagic foragers and thus unlikely to utilise Bream Bay to any great extent.

21. I will focus on two resident species - kororā little penguin (At Risk – Declining) and pakahā fluttering shearwater (At Risk – Declining).

22. Kororā breed in significant numbers on islands and headlands immediately adjacent to Te Ākau Bream Bay. Tracking studies across two separate years have shown that birds from Mauimua (Lady Alice Island) one of the Marotere (Chickens) Islands, foraged almost exclusively within Te Ākau Bream Bay, targeting waters <50m depth (Lukies 2019, Lukies *in* Gaskin, C.P. (ed) (2021)). Note, this is in preference to foraging in deeper waters outside the islands. That distribution was reinforced through modelling in Brough et al. (2024) which indicated high predicted probability of occurrence across the sand extraction area across both warm (Dec-Apr) and cool (May-Sept) seasons. In other words, the birds are prioritising foraging in Bream Bay.

23. Tracking of pakahā from Pokohinu (Burgess Island, Mokohinau Islands) in the outer Hauraki Gulf demonstrated a perennial hotspot foraging strategy with adults feeding consistently within select nearshore areas of Tikapa Moana/Hauraki Gulf across the three years of study. Birds from this colony consistently commuted inshore to forage within the Hauraki Gulf in three consecutive years (2019-2021), even during a persistent marine heatwave in 2021. (Whitehead 2023). While tracked birds from the Mokohinau Islands showed a preference for inshore areas south of the extraction area, it is notable that with the much larger and more numerous colonies of pakahā on islands immediately adjacent to Te Ākau Bream Bay, pakahā are, not unsurprisingly, frequently observed there in large flocks. Again, Brough et al. (2024) shows the spatial distribution of pakahā in their study further highlights the inshore preference for this species, particularly within Te Ākau Bream Bay.

24. For both these species the proposed extraction area is a significant proportion of their foraging ranges. I believe the level of exclusion effects for foraging on pakahā and particularly kororā have been **significantly underestimated b**y Dr Thompson.

25. **Reduced prey abundance or prey availability.** Dr Thompson noted that while it is possible the proposed operation could cause direct mortality of seabird prey he thinks this is very unlikely, since seabird prey (typically, fish, cephalopods, crustaceans or some combination of these) tend to be pelagic (rather than benthic) and are highly mobile, being able to move away from extraction activity. Mobile prey could be temporarily displaced from the area being extracted but would be available for capture at some other location. Furthermore, Dr Thompson notes, alternatively, sand extraction activities could affect seabird prey abundance by reducing primary productivity at the base of the food chain. This reduction in productivity could propagate up the food chain resulting in lower abundances of higher trophic level (seabird) prey (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 19).

26. With respect to turbidity levels Dr Thompson argues that once the proposed sand extraction activity ends (noting also that, 1/ sand extraction will occur for a

maximum of 3.5 hours per day and, 2/ for a maximum of 11% of the time over a year, because sand extraction will not occur every day), water conditions return to ambient levels relatively quickly. On this basis, he thinks it reasonable to conclude that the overall impact on primary production within the proposed extraction area will be **less than minor to negligible** (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 19-20).

27. Kororā and pakahā are visual diurnal foragers, i.e. forage during daylight hours. Dr Thompson's calculation of a maximum of 11% of the time over a year, appears to include hours after dark. While the number of daylight hours will vary through the year, the time available for these visual foragers as water conditions return to ambient levels will be greatly reduced.

28. Turbidity limiting the foraging ability of marine visual predators has wide-ranging conservation implications. Large marine areas have become more turbid in recent decades, driven by increased wave action and seabed shear stress associated with climate change. This affects both shallow coastal and deeper offshore shelf waters. Such a widespread decrease in light transmissibility through water is certain to have a negative effect on visual foragers occupying many trophic levels in these areas, as well as reducing light availability for primary producers (Darby et al 2022).

29. Additional loading of suspended sediments in known areas of high importance for foraging and feeding activity for both seabirds and marine mammals, whether through sea floor disturbance (e.g., trawling, dredging), or disposal of dredged material for example, could potentially add further direct and indirect effects. These include loss of habitat complexity, changes to seabed community, increased turbidity and suspended sediment concentrations (Sim-Smith et al 2023).

30. International evidence demonstrates the effects of turbidity on penguin foraging. Kowalczyk et al. (2015) observed that little penguins in Port Phillip Bay, Victoria, Australia, did not simply follow increased prey availability linked to nutrient-rich outflows from the Yarra River during periods of heavy rainfall. Although these conditions boosted prey abundance (such as anchovies), the penguins avoided highly turbid waters and instead foraged in clearer areas, indicating there is a threshold of turbidity beyond which prey capture becomes inefficient.

31. Dr Thompson points out that northeastern Aotearoa New Zealand continental shelf waters are a relatively high primary biomass area (Murphy et al. 2001). Citing a number of papers, he concludes these climatically driven mechanisms are the

main drivers of primary productivity across northeastern shelf waters, and that the proposed sand extraction activity would have a **negligible** effect on these processes and, therefore, on seabird prey abundance through primary productivity (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 20).

32. Te Ākau Bream Bay is a large embayment at the entrance to Whangārei Harbour with additional inflows from the Waipu River and Ruakaka estuaries. What influence the tidal jet that flows out of the harbour has on the oceanography and productivity of Te Ākau Bream Bay has not to my knowledge been studied in any detail. However, in the study above Kowalczyk et al. (2015) further noted with respect to estuarine plume fronts that they are a type of frontal system formed by interactions between tidal processes and river flow with the physical interfaces between these water bodies manifesting as steep gradients in temperature, salinity and turbidity. Within these areas, mixing, and nutrient retention enhance primary productivity, which in turn attract and aggregate zooplankton. Entrainment of phytoplankton and zooplankton attract foraging fish, making estuarine plume fronts important nearshore foraging features for marine predators, particularly seabirds.

33. For species already under pressure and in some cases declining, the potential effects of disturbance/degradation of the seafloor on the food-web higher up in the water column needs to be considered.

34. Northeastern waters of Aotearoa have experienced consistently warmer than average marine conditions during the last 12 years (Fig 1), including more frequent marine heat wave conditions (Shears et al. 2023).

35. When the ocean heats up, it stratifies where warm water sits on top and does not mix. This can suppress upwelling, reduce primary productivity, and potentially cause the whole food web base to collapse (Behrenfeld et al. 2006). Zooplankton, krill, and forage fish may decline. Those animals that remain may move deeper in the water column and shift southward (Benedetti et al. 2023, Atkinson et al. 2019). There may also be shifts in these communities in terms of the composition of the diversity of species present, and the zooplankton species that are potentially more thermotolerant and remain during marine heatwave conditions are a less favourable and nutritionally poorer resource for predators like seabirds (Mills et al. 2008). Seabirds respond to marine heatwaves by working harder. They increase their energy expenditure, fly further, dive deeper, and switch to lower-quality prey (Osborne et al. 2020, Piatt et al. 2020).

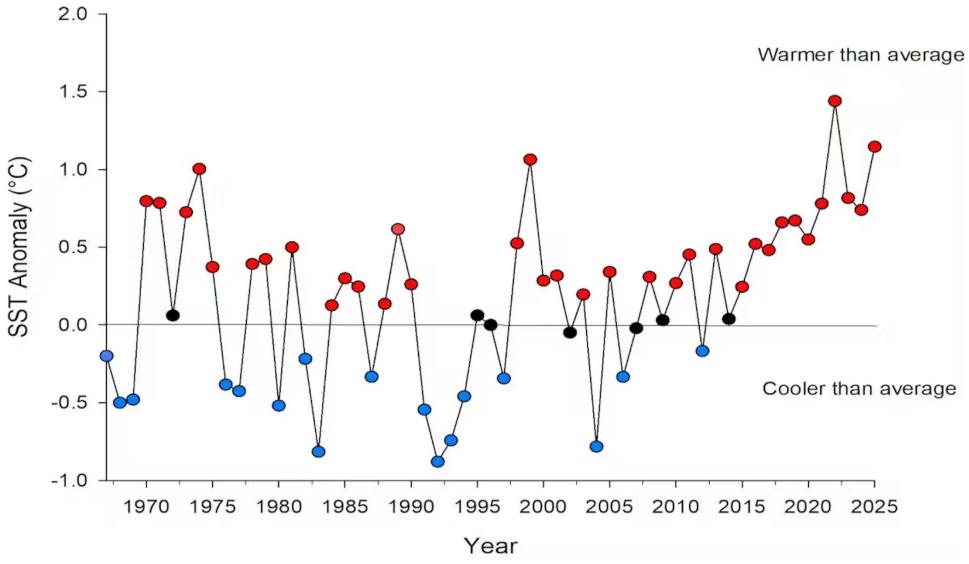

Figure 1. While seawater temperatures in the Hauraki Gulf have alternated between warmer and cooler years between 1967 and 2025, they have been consistently warmer during the past 12 years. This graph shows the sea surface temperature (SST) anomaly – how far each year deviated from the average baseline (red dots show warmer than average seawater, blue dots show cooler seawater). Data provided by Nick Shears, Leigh Marine Laboratory.

36. Whitehead's study (above) found that during the prolonged marine heatwave in Tīkapa Moana/Hauraki Gulf beginning in November 2021, pakahā still foraged consistently within select nearshore areas of Tikapa Moana/Hauraki Gulf. The study found that adult pakahā were undertaking longer duration (but not distance) foraging trips and returning with the same mass of food as they had in 2019 and 2020. The reasons for the longer foraging trips could have been the result of a reduced availability of zooplankton prey due to the warmer ocean conditions in 2021 (Whitehead 2023, Dunphy & Whitehead 2026).

37. It is notable, that kororā have suffered mass mortality events in northern waters in recent years, mostly fledglings from mainland and Inner Hauraki Gulf island colonies starving. Mass die-offs used to be a once in a decade event. Climate change is increasing the frequency of marine heatwaves, and we may see these 10-year events instead occurring every two to three years. These warm water

events are likely to increase the number of poor breeding seasons for kororā in northern New Zealand (Department of Conservation).

38. These events raise concerns, not only for the aforementioned species but also others for which the nearshore environment are hotspot foraging areas, and that any further disruption of marine food webs adds to the uncertainty of prey availability for seabirds within Te Ākau Bream Bay. I do not believe that the potential influence of sand mining on marine food webs has been adequately investigated either by the applicant or through independent research.

39. **Interaction with the sand extraction vessel.** Dr Thompson notes in his 1 Background section that sand extraction is proposed to take place predominantly during the day and to occur for a maximum of 3.5 hours per day. Two operating 'windows' are proposed: from April to September sand extraction is to occur between 12:00 and 18:00 hours, and from October to March sand extraction is to occur between 12:00 and 20:00 hours. Once the *William Fraser's* hopper is full of sand the vessel will return to MBL's Port of Auckland depot (or other destination port) for unloading (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 7).

40. And further under light attraction, Dr Thompson notes: Whilst these operating windows and hours will, for the majority, occur during daylight, there will be a relatively small number of days when sunset occurs before the 18:00 or 20:00 cut-offs for sand extraction operations. Assuming that sufficient natural light is available immediately following sunset, there will still be some days when the time of the end of civil twilight (i.e., the period from sunset to when the centre of the sun is six degrees below the horizon and when artificial light may not be required) occurs before the 18:00 and 20:00 cut-offs. However, the time from the end of civil twilight to the operating cut-offs will be relatively short: maximums of approximately 15 minutes and 17 minutes for the April to September and October to March periods, respectively (timings of sunset and of civil twilight obtained from the 'timeanddate' website) (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 20).

41. I generally agree with Dr Thompson's assessment, that if the standard mitigation measures are employed by the sand extraction vessel within a light management plan framework, and given the relatively few occasions when artificial nocturnal lighting would be required, then it would be reasonable to conclude that the effect of nocturnal lighting on the extraction vessel on seabirds will be **minor**.

42. However, the **Light Management Plan (LMP)** details the use of lights (including floodlights) during extraction operations. Previously at Pakiri MBL extraction operations were conducted at night (Attachment Twenty-Seven – Sand Extraction Operation Plan ("SEOP"), Section 3. Pages 21-27)

43. If the *William Fraser* conducts any sand extraction activities in Te Ākau Bream Bay during nighttime hours, which the LMP clearly describes, then the effect of nocturnal lighting on the extraction vessel on seabirds increases significantly.

44. Also, if, as above, the vessel heads away once full at the end of their operating windows, it is possible the crew will clean decks etc. while under way under flood lights, thus for a short period the vessel could still within Te Ākau Bream Bay although not necessarily in the extraction area.

45. The LMP acknowledges that seabirds are susceptible to disorientation from artificial lights at night, which can lead to vessel strikes (Attachment Twenty-Seven – Sand Extraction Operation Plan ("SEOP"), Section 3. Pages 26).

46. However, what is not set out is that the islands in the vicinity of Te Ākau Bream Bay are breeding sites for eight species of petrels and shearwaters (Procellariids) which number in the tens of thousands. It is the fledglings of this group of seabirds which are highly susceptible to attraction to lights on vessels, at those times when they depart their colonies at night for the first time. Timing varies between species, but fledglings across all eight species would be departing from late November through to May. November to January: kuaka/northern diving petrel, totorore / little shearwater, pakahā / fluttering shearwater and ōi / grey-faced petrel; February-March: takahikare-moana/white-faced storm petrel; March-April: tītī/Pycroft's petrel; and May: toanui/flesh-footed and tītī/sooty shearwaters.

47. The LMP refers to the Mitigation Standards to Reduce Light-induced Vessel Strikes of Seabirds with New Zealand Commercial Fishing Vessels (DOC/MPI 2023) and details mitigation measures accordingly. But these would not be required were the *William Fraser* to conduct extraction operations only during daylight hours and use minimal lighting while transiting (as per Fig. 15 in the SEOP).

48. I agree with the requirement in the EMMP for the operation to maintain a Seabird Interaction Log (Attachment Twenty-Nine - Environmental Monitoring Management Plan ("EMMP"), Section 9 Logs, page 29).

49. However, the Seabird Interaction Log template as presented in the EMMP (Attachment Twenty-Nine - Environmental Monitoring Management Plan ("EMMP"), Appendix G) appears to be for marine mammal/reptile interaction log

entries, not seabirds, and includes logging observations during the whole operation, which in my view would be an impossible task for a working crew to maintain. While dedicated at sea surveys for seabirds are desirable, I see logging observations during the whole operation as unrealistic for a day-to-day operation.

50. I suggest that a new Seabird Interaction Log template is drawn up and made seabird specific, separate from the marine mammal and reptile ones. That it also includes data fields as to the nature of the interaction, what state the bird is in (i.e., dead, etc.), cause of mortality or injury if known, whether the bird has been held on board, and subsequently transferred to a bird rehabilitation centre.

51. Also, with respect to release of birds unable to leave the *William Fraser* on their own accord. Because it is hard to assess whether a bird has sustained injuries, my recommendation is for the crew to hold the bird in a closed (but ventilated) cardboard box, keep it in a relatively quiet, dark, clean space, and for the DOC Wildlife Response Group (0800 DOC Hotline) to be notified so the bird can be collected on return to port and transferred to a recovery centre in Auckland.

52. The EMMP recommends that interaction records are submitted to DOC on a quarterly basis for 'information collection purposes' (Attachment Twenty-Nine - Environmental Monitoring Management Plan ("EMMP", Section 9 Logs, page 29).

53. As interactions with seabirds during daylight hours are highly unlikely, any interactions with seabirds on the *William Fraser* within Te Ākau Bream Bay which result in death or injury should require immediate notification to DOC.

54. **Fuel/Oil spill.** Dr Thompson spells out the risks to seabirds adequately, provided the measures outlined are followed, noting MBL have made changes to equipment to further mitigate risk (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 22).

55. While the likelihood of an impact from catastrophic failure of the *William Fraser* or any other ship may be remote, in the event of a fuel/oil spill occurring and making its way into the sea, then diving seabirds in particular (e.g., kororā, pakahā and kuaka/northern diving petrels) are at high risk from ingestion and damage to plumage in the event of spills. Other species occurring within Te Ākau Bream Bay and coming into contact with the oil would also be similarly affected.

56. Major spills are catastrophic for seabirds (e.g. *Rena*), but even relatively minor ones can have detrimental effects. I recommend that DOC, and possibly relevant hapū/iwi groups, are added to the agencies to be immediately notified of any oil spill.

57. I agree with Dr Beauchamp in his evidence for DOC that Dr Thompson (NIWA, Attachment 13) appears to rely on the applicant having an oil spill contingency plan signed off by Maritime New Zealand, but there is no indication in the current plan about what equipment the *William Fraser* must carry to deal with onboard spills.

58. **Airborne noise.** I agree that airborne noise is likely to have a **negligible to non-existent** disturbance effect on seabirds foraging in Te Ākau Bream Bay (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 23).

59. **Noise (underwater noise).** Dr Thompson notes that for most seabirds utilising Te Ākau Bream Bay information on sound reception and hearing while underwater is lacking. However, he cites Pine (2025) who estimated that noise from the sand extraction vessel would be audible to kororā northern little penguin approximately 5.9 km away, but that small behavioural responses would be unlikely to occur beyond approximately 200 m from the vessel. He surmised that given the highly mobile nature of kororā northern little penguin and other diving seabirds, it is likely that the predominant response to underwater noise generated by the extraction vessel will be to move away, but such a response would be temporary and of **less than minor** consequence for seabirds affected (Attachment 13 - Assessment of Seabirds and Shorebirds Effects (NIWA), Thompson, page 23).

60. Given that information on sound reception and hearing for seabirds while underwater is lacking, both locally and internationally, it is difficult to assess the effect on kororā and other diving species from the sand mining operations. This operation could result in exclusion from part of Te Ākau Bream Bay, which for kororā is demonstrated to be an important foraging area. I disagree that kororā are as highly mobile as Dr Thompson suggests. Thus, there is potential for them to avoid foraging in the operation area all together, rather than simply moving away during operation hours. This would be deleterious as the area has been shown to be an important foraging area for kororā.

Cumulative effects

61. Establishing measurable indirect effects that particular extractive operations have on food webs and marine fauna including seabirds is challenging especially given cumulative effects from other pressures. In Te Ākau Bream Bay this will mean sand mining impacts in addition to future effects from marine heat waves, storm events, commercial fishing, and deposition of dredged material from Whangārei Harbour. Marine heat waves and increasing storm events are already having detectable effects on seabirds as noted above. Further potential disruption of

marine food webs such as from long term sand mining will add to the uncertainty of prey availability for seabirds within Te Ākau Bream Bay.

62. Te Ākau Bream Bay is demonstrably an extremely significant feeding ground for seabirds, not only for those breeding on islands and mainland sites in the immediate vicinity, but also from further afield (e.g., Poor Knights, Mokohinau, Hauturu and Aotea Islands). For resident kororā, a central place forager with limited range, breeding on Taranga, all the Marotere Islands, Bream Islands, and at Bream Head, Te Ākau Bream Bay is the focus of their foraging activity throughout the year.

63. As well as kororā and pakahā, 13 other species regularly (i.e., distinct from 'likely to occur') use Te Ākau Bream Bay. Other resident species are tākapu/Australasian gannet, tara iti/NZ fairy tern, tara/white-fronted tern, tarāpunga/red-billed gulls, karoro/southern black backed gull, and kāruhiruhi/pied shag. Migratory species that forage within Te Ākau Bream Bay in significant numbers during their breeding months, i.e., are absent from the region post-breeding for up to five months, include: rako/Buller's shearwater, toanui/flesh-footed shearwater, titi wainui/fairy prion, kuaka/northern diving petrel, totorore/little shearwater, and takahikare-moana/white-faced storm petrel.

64. Several species of seabirds commonly associate with cetaceans (including the 'Threatened' tākoketai/black petrel, 'At Risk' toanui flesh-footed/shearwater). Cetaceans forage at depth, and when bringing prey to the surface can be messy feeders generating discards. The birds feed on uneaten scraps scattered on the surface. This includes prey captured at depths normally well beyond the diving capabilities of these species (Gaskin 2017, 2021). In other cases, feeding activity of dolphins can concentrate prey close to the surface making it easier for the seabirds to target. For those species that commonly forage with cetaceans, any impact on cetacean activity in Te Ākau Bream Bay would have a flow-on effect to birds.

65. Dr Thompson presents a comprehensive assessment of potential impacts on seabirds from the proposed sand mining operation Te Ākau Bream Bay and acknowledges the importance of Te Ākau Bream Bay for seabirds. While I broadly agree with the Applicant's assessment with respect to effects on seabirds, I believe that Dr Thompson has underestimated the importance of Te Ākau Bream Bay for locally breeding 'At Risk' species.

Conditions

66. The current proposed conditions (Attachment 3; Condition 29) suggest an operating window in two bands, 1200-1800 hours between April and September and 1200-2000 between October and March. Dr Thompson indicates that for a few days there is a potential for operating beyond civil twilight. Condition 29 indicates that the loading of the *William Fraser* will not exceed 3.5 hours. Consequently, it appears that there is plenty of time before sunset for the *William Fraser* to load, and for sand extraction to not need to take place into civil twilight. Also, the duration of daylight at any latitude throughout the year is well known, and can be calculated to the minute[1], so the condition relating to sand extraction operation times could be altered to require sand extraction to be completed and the *William Fraser* exiting Te Ākau Bream Bay before sunset, reducing the light attraction risk to seabirds completely.
67. The current conditions (Attachment 3; Condition 19) now requiring an LMP (as referred to above) replace TOC Conditions 45.

Monitoring recommendations

68. To address potential effects of habitat modification/degradation and reduced prey abundance or availability in the proposed sand extraction area, the following are recommended:
69. A monitoring programme designed for resident species, kororā and pakahā, with the aim to determine whether there are impacts on seabirds attributable to the sand mining operation, which would lead to adaptive management approaches. Such a project would need to be undertaken with the appropriate Wildlife Act Authority and Ethics Approval.
70. Instead of any 'continuous' monitoring of seabirds by the crew of the extraction vessel (it is not clear whether that was actually proposed for seabirds in the EMMP), I would recommend that dedicated independent shipboard seabird surveys for marine megafauna (i.e., seabirds, cetaceans, marine reptiles) within Te Ākau Bream Bay and the sand mining area are undertaken by trained observers one day every three months. Modelling of the resulting data could help determine whether there are any changes in seabirds use of the extraction area during mining operation. The resulting analysis would be reviewed at intervals of five years to decide whether to include an adaptive management condition.
71. All seabird interactions during operation which result in death or injury to a seabird should be logged and notified to DOC as recommended in the EMMP. As noted above (paragraph 54), interactions with seabirds during daylight hours are highly

[1] Sunrise Sunset Times of Marsden Point Road, Ruakākā, New Zealand - MAPLOGS

unlikely– and if a pattern of death or injury emerges, this should prompt a review of conditions to ascertain the cause and appropriate mitigation or other remedial action.

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