

## **Review of the s42A report regarding an application by Kaipara Ltd to extract sand offshore from Pakiri Beach.**

### **Introduction**

1. In the executive summary of the s42A report dated 1 March 2021 (p. 10) I see that “it is recommended that, subject to new or contrary evidence presented at the hearing, this application for resource consent be approved subject to conditions.”
2. I do not think that the assessment of ecological effects encompasses all of the necessary information on biodiversity, specifically from my perspective, it does not address impacts on “threatened” and “at risk” bird species listed in the Department of Conservation’s published threat classifications. I do not think that this application can be responsibly granted until this has happened and any adverse effects on them have been meaningfully assessed as “less than minor”.
3. My aim in this submission is to present some evidence that is definitely contrary and possibly new to show that there is a case that needs to be answered, especially regarding the “nationally critical” New Zealand fairy tern but some other “threatened” and “at risk” bird species along the Pakiri coast. I do this mainly by addressing points raised in the s42A report and the addendum and bringing in information from unpublished data and the literature to support my point of view.
4. Firstly, evidence is presented to show that there are already issues affecting the seabirds breeding along the Pakiri coast although the cause of these problems may not be directly caused by sand mining as it can’t be disentangled from other issues in the wider Hauraki Gulf but it can’t be ruled out. My evidence mainly concerns feeding birds looking at changes in benthic ecology and how these may impact even surface feeding species. I also show that the marine habitat is more important to fairy terns than is indicated by Mr West and Dr Sivaguru and also that fairy terns are easily capable of reaching and regularly feeding over the proposed sand extraction site. I do not claim that food is the only issue that might impact these species, only one that I can address to some extent from my specific experience with fairy terns, my reading of the literature and my wider knowledge of New Zealand birds.

### **Benthic ecology**

5. In the s42A report, the technical memo prepared by Dr Sivaguru (p.25 & p.321) clearly indicates that there are differences in the benthic fauna of the sand mining site and the control area. If the sampling was correctly set up this is effectively the outcome of a standard but powerful ecological experiment showing that sand mining has had an impact over and above all of the other factors that have occurred over these sites. This should include all other activities with the potential to cause severe damage like scallop dredging but, note also, it should not be regarded as natural variation.
6. It is noted that sessile organisms will be sucked up by the dredge and discarded with, or without damage and, although not monitored, there will be recolonisation afterwards. The net ecological effects identified are the increase in species that are robust enough to withstand dredging or able to recolonise and grow rapidly while more fragile species decline

in importance (p.331). Changes to the grain size of remaining sediments could also lead to change in the benthic fauna (p.332).

7. I regard this as transformational change to the local benthic communities. Dr Sivaguru considers *“the loss is likely to be localised and will not have more than minor adverse effect on the wider Hauraki Gulf ecosystem”* (p.331) and also regards these communities as common along the north eastern coast of the North Island (p.25). I understand this to be the main basis for regarding the effects of sand mining on benthic ecology as minor.
8. The time to recovery for benthic communities is estimated at six months to several years (p.25) but even the shortest period is a long time in terms of the seasonal cycle of a bird and several years can be most of a lifetime. More importantly, specifically looking at horse mussel beds, this time period required for recovery seems to be much longer than several years and may not occur at all.
9. The Bioresarches report states that, prior to dredging in 2003, “horse mussels and fine sand fingers” were the predominant seabed type covering 42% of the seafloor (p.3). After this “aggregations of horse mussels were not observed by video or still photography, or dredge tows in the 2006, 2011 and 2017 studies, but were observed in shallow water in the 2003 survey. However, a number of juvenile horse mussels were recorded in the grab samples from Area 1 in 2017” (p.28). In conclusion they state “The horse mussel was present in beds in 2003 prior to sand extraction but has since declined to a few patchy juvenile individuals is potentially one example of a sand extraction disturbance effect” (p.29.). “A few juvenile horse mussels” does not constitute a recovery of the former horse mussel beds and may not even be the start of one.
10. This is fourteen years so far – so recovery takes more than “several years” and it may approach, or exceed the proposed time taken to dredge the entire area (estimated 22 years) so recovery may not, in fact, be possible.
11. Horse mussel beds provide many ecosystem services. Most importantly for seabirds they provide a good habitat for small fish, have a valuable nursery role for several species and provide a preferred habitat for the adult fish of some species (Morrison et al 2014) so there are potential flow-on effects for birds.

### **Potential impacts on birds**

12. Birds that may depend on food taken off the Pakiri coast are not necessarily common along the north eastern coast of the North Island and, particularly when breeding, birds have a limited ability away from the nest to move to avoid unfavourable conditions. A number of “threatened” and “at risk” bird species listed in the national threat classification lists are present in and adjacent to the proposed mining site and some were listed by both Mr West and myself in our primary written evidence. Some of them are nesting along Pakiri Beach and breeding colonies of some others are found on Mangawhai sand spit so the waters off Pakiri Beach are very important to them.

13. In spite of this no useful fieldwork on birds was carried out by the applicants. The technical memo sums up the evidence nicely in two sentences (p. 334): *"The applicant's assessment states that no direct adverse effects to marine mammals or birds have been reported by the barge operators."* and *"It has been observed that red billed gulls frequent the area of the plume close to the barge for foraging for biota fragments."* These are just anecdotal observations, not an assessment of effects.
14. Neither fish nor birds have been assessed at all by field work or a meaningful consideration of the literature in spite of a recognised habitat of New Zealand's rarest bird species, the New Zealand fairy tern, and several other "threatened" and "at risk" species being immediately adjacent to, or overlapping, the area in contention. It must be recognised that the literature on many bird species is incomplete, off hand, for fairy terns I am only aware of 13 published papers with them as a main subject with most of them being short and reporting highly specific subjects. Many of the other species are little better represented so fieldwork always has the potential to add important information.
15. An addendum to the s42A report, dated 9<sup>th</sup> April 2021, has been prepared and it includes an assessment of my written evidence, mainly regarding the New Zealand fairy tern Dr Sivaguru states that *"we have no evidence to show that existing sand extraction along the Mangawhai-Pakiri coastline has had negative effects on local seabird populations"* (p.6) but it should also be recognised that there is equally no evidence to show that sand mining is harmless or beneficial either. No assessment was carried out and no relevant literature exists so there is no way to directly address the effects of sand mining, rather than anything else, on any bird species here. It can, however, be shown from available data that, fairy terns breeding at Pakiri and Te Arai suffer from an unusually high adult death rate while rearing chicks and the size of the Caspian Tern colony has approximately halved since the 1980s. Similar information does not exist for other species. Sand mining may, or may not have contributed to these issues.
16. The proposed addition of fairy terns to the Environmental Monitoring Management Plan could address some of the obvious information gaps but I do not think it fully recognises the gravity of the situation. The population size and potential productivity of New Zealand fairy terns are now so low and there have already been enough other detrimental changes, such as the mangrove removal at Mangawhai, that they really are on the edge of extinction. It is quite possible that monitoring alone might only tell us why these birds became extinct. At least some work prior to the commencement of mining is required to give some idea of how important the area is to them.
17. There is also some misunderstanding about foraging range and habitat which partly comes from reliance on the sparse published literature that only offers limited local perspectives rather than a balanced picture of fairy tern feeding.

#### **Further evidence**

18. In the second part of my evidence I want to expand upon some of the issues raised above:
  - Known issues facing seabirds along the Pakiri coast
  - Fairy tern foraging range and feeding habitat

- Food web interactions involving seabirds
- Lights at night

### Known issues for seabirds along the Pakiri coast

#### Deaths of breeding adult fairy terns.

19. In my written evidence (28-30) I noted the deaths of five adult breeding adult New Zealand fairy terns at Pakiri and Te Arai whilst feeding chicks. I further noted the loss of body condition during breeding and the lack of evidence that they were related to predation, storm impacts or health issues and take place during peak food demand. This suggested to me that food stress as a likely cause of this mortality and my concern was that the sand mining could, in some way, have contributed to this although this cannot be known from available information.
20. Since then, I have looked in more detail at fairy tern mortality using the DOC database and the ranger’s field reports. From 1997 to 2020 I have counted the number of breeding pairs in each site for each breeding season and added them up to give a total number of “pair years”. I have also looked for evidence of deaths during the breeding season and looked at the causes of death that were identified or suspected (table 1). This shows that mortality of a breeding adult bird during a nesting attempt is roughly three times more likely along the Pakiri coast than in any of the other breeding sites. In some cases, when there was no obvious cause of death, poor body condition was specifically noted. In addition, not all storms kill fairy terns so food stress may contribute to both but illness (coelomitis in this case) and predation are presumably unrelated to food. If these deaths are excluded, the difference is five-fold.
21. Most fairy terns appear to die during the non-breeding season, this is certainly true of breeding birds that usually just fail to reappear at their traditional sites. Pakiri and Te Arai are different to all of the other breeding sites in this.

	Number of pair years	Total adult deaths during nesting	Predation	Storm	No obvious cause	Illness	Percentage of adult deaths per pair year
Pakiri and Te Arai	19	5			5		26%
Mangawhai	99	7	3	2	2		7%
Waipu	49	6	3	1	2		12%
Papakanui	45	3		1	1	1	7%
The other three sites	193	16	6	4	5	1	8% (5% excluding predation and illness)

Table 1. The deaths of breeding adult fairy terns during nesting attempts from 1997 to 2020.

22. Population growth is a balance of mortality and the recruitment of breeding birds. Pakiri has been regarded as a particularly productive site, especially prior to 2013. The observed level of mortality could balance this out so I also looked at the recruitment of breeding birds from chicks reared at Pakiri.
23. Fairy terns resumed breeding at Pakiri in 2003 but eggs from the first nest was taken to be fostered elsewhere so they haven't been included in this analysis. There was no breeding in two years so there has effectively been one breeding pair present for 15 breeding seasons. In addition, a pair has bred at Te Arai over four seasons. From nesting attempts at both sites there have been 17 chicks banded at Pakiri and two at Te Arai, and seven of these chicks have recruited into the breeding population. Three chicks, hatched in the 2019-20 and 2020-21 seasons have not bred yet but are still alive and may survive to breed but the mortality of young birds seems to be relatively high.
24. Over 17 years there has been a surplus of only two recruits over deaths during the breeding season but this does not count three deaths that have occurred away from the breeding site where most other fairy terns die. Even though two more young birds may yet breed if they survive that long, from these figures I do not think that fairy terns are doing especially well along the Pakiri coast. They may not even be holding their own without immigration from other sites.
25. This current level of site-specific adult mortality along this coast cannot be ignored. On the one hand it would not be acceptable to have it increase and on the other, if it could be alleviated, it would improve population growth for the whole species, perhaps considerably.

#### **Caspian Tern decline at Mangawhai**

26. The sand spit at Mangawhai, just to the north of the sand mining area has a diverse and abundant fauna of breeding birds including inshore seabirds. Like fairy terns all of them have a restricted range while breeding due to the requirement to return to their nests at regular intervals. I do not know the effective feeding range for any of these species but presume that their main feeding habitat is off the local coast.
27. Caspian terns at Mangawhai seem to be declining slowly from about 120 pairs recorded in the 1980s to about 60 pairs in 2016-17 (Harris et al 2019). The overall species population is more or less stable nationally and a colony of about 60 pairs has recently formed in Whangarei Harbour (Jim Eagles pers. comm.) and may represent the displaced birds.
28. Caspian tern colonies can move and the usually suggested causes of displacement include predation, human disturbance, habitat change and storms (Barlow 1995). At Mangawhai the Caspian tern colony is protected quite well from human disturbance and predators and the encroachment of vegetation is not yet an issue although there is some loss to storms. By elimination of these more usual issues I would suspect that the recent displacement of these birds from Mangawhai is more likely due to food issues. The apparent displacement suggests that there has not been a population impact on Caspian terns but it may be an indicator of change in the local coastal ecology over the last few decades. In spite of this decline the

colony at Mangawhai still remains a nationally significant colony with almost 5% of the breeding population.

### **Fairy tern foraging range**

29. For all breeding birds there are economic constraints (time and energy) that mean there will always be a maximum possible distance from their nest for regular feeding and successful reproduction. There are clearly advantages in feeding close to the nest but at some distance there is just not enough time to catch each fish and carry it back to the nest without the birds starving.
30. It is not known whether, or not, fairy terns do actually feed over the proposed mining site. In my written evidence I mention that fairy terns can be seen foraging for at least 2km out to sea, approximately the near edge of the mining site, and I had suspicions that they would go further. This is based on following birds from the nest at Pakiri with my binoculars until they disappeared from sight. On Mangawhai Harbour, from off Lincoln Street, I have detected fairy terns fishing in the channel toward Insley Street, a little over 2km away. It is also possible to work out distances that fairy terns can effectively travel and still breed successfully to know whether it is possible for them to reach the mining site, or not.
31. Most fairy terns just nest on the beach adjacent to their feeding territories to minimise the commute. Mangawhai Harbour is different from the other sites because suitable feeding habitat extends well past the bare sand suitable for nesting so some birds are forced to travel to their feeding territories before they can forage. The male feeding farthest away from his nest is R-PGM with a territory boundary closest to the nest in front of the Riverside Motor Camp about 3.5 km away (figure 1). When he and his mate reach the feeding territory they repeatedly patrol an area extending another 1 km, well above the causeway. This territory has been defended successfully and chicks have been raised by the pairs that feed there.
32. The male that began to use Te Arai Stream mouth to nest, YM-B, initially also maintained a feeding territory on Mangawhai Harbour from Moir Point to about half way to the tavern (figure 1). The distance between his nest and the feeding territory he defended was about 5.2 km and his territory also extended a further 1 km. Over the first two seasons he bred at Te Arai he successfully defended this territory until the pair had eggs but then he lost it to young single males and after that he was never seen there. It was obviously a viable food source, because they nested, but not a defendable food source when extra time was required for incubation. If, due to the large area, fairy terns do not defend feeding territories at sea a distance of about 6km from the nest seems a feasible lower limit to the distance they could reach and feed effectively.

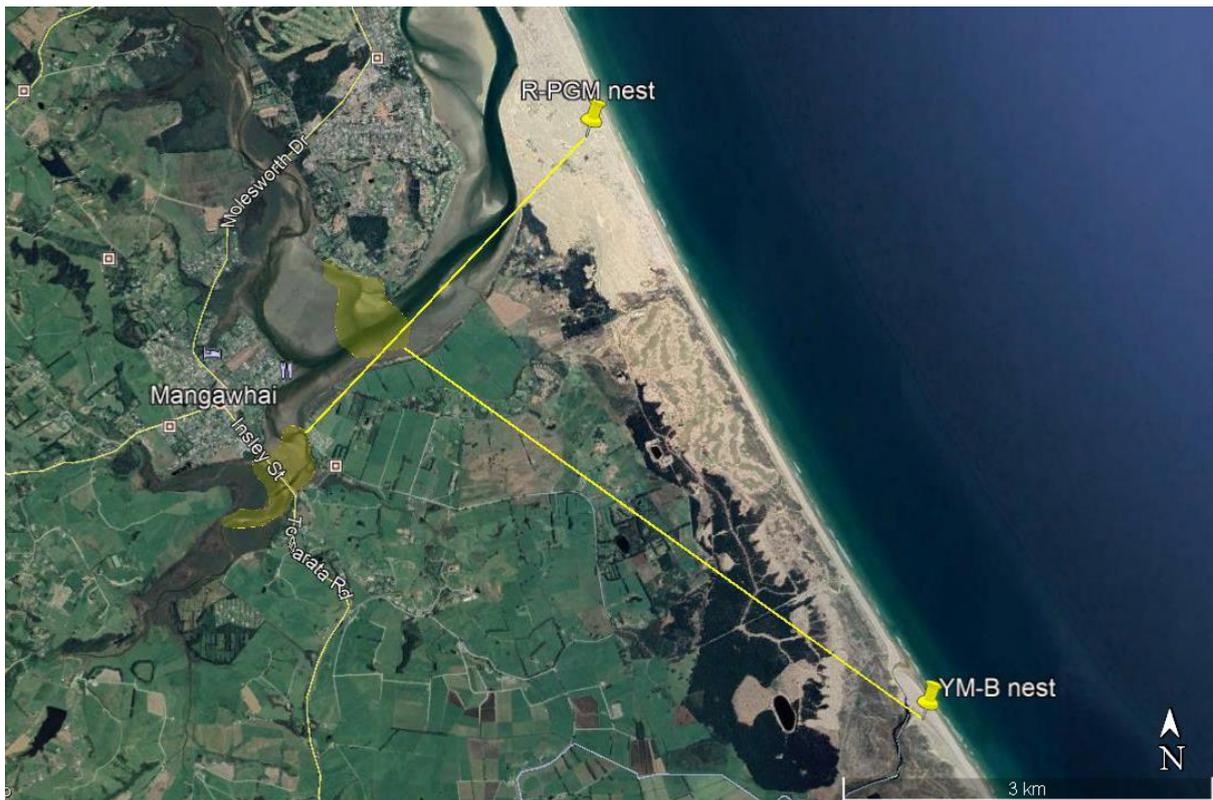


Figure 1. The nests, feeding territories (yellow shading) and the distances between them of the two fairy terns discussed that fed in Mangawhai Harbour and bred on Mangawhai sand spit and at Te Arai Stream mouth.

33. In the 2009-10 breeding season at Waipu there was an unusually high degree of predation from cats with many nests and some adult birds taken. A pair of birds, WB-M and M-PGR, shifted their nest site to Mangawhai, presumably for safety, but they still fed in their feeding territory at Waipu Cove. This was determined by observers recording departure and arrival times of these birds and verifying that they were travelling between these sites (Gwenda Pulham pers. comm.). At Mangawhai they laid one egg but it did not hatch. This might mean that this distance was too great for a viable breeding attempt although this pair in this season laid a record four clutches of eggs so their reserves may have been depleted before this attempt began. The distance between Mangawhai and Waipu Cove is at least 12km and I regard this as being too far to support a successful breeding attempt.
34. From these measurements I think the maximum foraging range of successful breeding New Zealand fairy terns would at least 4.5km but probably 6km, possibly more, and would be less than 12 km. This means two things. That breeding fairy terns could viably feed right across the proposed mining site and even beyond a it to a small extent but they could not go far beyond it to non-mined areas to compensate for reduced food supply. They may essentially be constrained to feed within the same area where sand is being extracted but the degree to which they actually overlap the proposed mining site remains to be determined.

#### Fairy tern feeding habitat.

35. The literature on the foraging of New Zealand fairy terns is sparse and refers to specific studies in specific habitats. There are no general reviews of feeding ecology and behaviour so none of them has been placed in context. Indeed, at present we do not have enough information to do this so it is not reasonable to make general conclusions about how and where fairy terns feed.
36. Both Mr West (primary evidence dated 12 Feb 2021, paragraph 4.54 & 6.14) and Dr Sivaguru (addendum report, section 1.1.5) state that fairy terns primarily or mainly feed in estuarine and nearshore habitats, including coastal lagoons and lakes. Mr West also notes that few dives have been observed in nearshore coastal waters in two studies (1% - Jeffries et al 2016 or less – Ismar et al 2014). It should be noted that the primary focus of these studies was to study the use of Te Arai Stream mouth and fishing intensity in Mangawhai Harbour, respectively and foraging at sea was not a focus of interest.
37. There are two good lines of evidence that suggest these two studies may be misleading when used to determine the amount of feeding out to sea. In my written evidence (36) the analysis of several seasons of observations showed an average of 29% of meals for chicks being delivered from the sea at Pakiri and the remainder from the estuary. Looking at stable isotope ratios in feathers Ismar et al (2014, p. 82-83) noted that “large variation in chick  $\delta^{13}\text{C}$  values may indicate a variation in the contribution of oceanic prey to offspring provisioning in NZFT between different breeding sites and years.”
38. Both of these results are quite different to what would be expected from extrapolating these two studies. Here it is worth repeating the point made in my written evidence (22) when I noted that the similar American least tern was regarded as an estuarine feeder until specific foraging studies showed that 75% of their feeding was offshore. I expect a similar observation bias here, although perhaps not so large there may be a substantial catch of food too far out to sea for shore based observers to see.
39. While the majority of the food for chicks may not come from the ocean, the amount that does is large enough to be important.

### **Food web interactions involving seabirds**

#### **Prey of fairy terns and other surface feeding birds**

40. Maps of fish eggs and larvae compiled by Crossland (1981) show concentrations of pilchard larvae in October-November in 1974 and 1975 and anchovy larvae in December 1975 up to or near the coast along the north eastern boundary of his study site at Cape Rodney and looking as if they would continue further north along Pakiri Beach. Although more than 40 years old this study suggests that there may be nursery grounds for both of these species off Pakiri Beach. Both species feed on plankton and wind forced upwellings along the coast may provide good feeding for them. Little terns in England, another small tern species very similar to fairy terns, seem to tailor their breeding attempts to fit the availability of fish in a regular herring nursery site with productivity varying with the numbers of fish available (Perrow et al 2006). Fairy terns seem to have more feeding options with the availability of estuarine food but it is quite possible that a similar situation may exist with young pilchards and anchovies providing a key food resource during breeding.

41. Both pilchards and anchovies provide nutritious food for many species of seabird but both are pelagic and might not be expected to be impacted by disturbance on the sea floor. One potential link, however, is likely to be provided by predatory fish like kahawai, that feed throughout the water column down to the seafloor (Baker 1971), and provide an important food source for seabirds when they concentrate schools of small fish and force them to the surface. The relationship between kahawai and white-fronted terns, an “at risk” species breeding on Mangawhai sandspit and Goat Island and often feeding off Pakiri Beach, is so well known that many fishermen refer to them as “kahawai birds” and use them to locate schools of feeding fish. The unusually high abundance of fish eating birds seen so close to the beach at times (my written evidence (9)) is often indicative of feeding kahawai, even in the absence of “boil ups” (Chris Gaskin pers. comm.) and this when fairy terns are also often fishing there (pers. obs.).
42. The reason that New Zealand fairy terns are making their last stand along the coastline between Waipu and Pakiri may be due to a special combination of three factors together, good breeding sites, good estuarine food sources and a good supply of marine prey handy to the nest sites.

## **Penguins**

43. Of all of the seabirds feeding off Pakiri Beach little blue penguins have the greatest diving ability. Theoretically they could dive up to 70m but most dives are less than 50m deep and they have a greater breeding success if they have access to larger areas of water no deeper than this (Chiaradia et al 2007). Dives are usually shallow and prey often pelagic mostly small nearshore pelagic schooling fish, with some squid and krill. They have the capacity to reach the seafloor and fish there throughout the proposed mine site.
44. Food failure for little blue penguins is a periodic event occurring at roughly ten year intervals (DOC 2021). A study of a large wreck event in Northland in 1973-4 gives a body count for the beach between Mangawhai and Pakiri where 1276 penguins were picked up from January to May 1974. All of these birds were immature and most were females (Crockett and Kearns 1975). Even if some of these birds washed in from further afield this count suggests that very large numbers of penguins may utilise the area off Pakiri Beach. Mortality events often affect inexperienced young birds disproportionately but the sex ratio is more interesting. Recent work suggests that male penguins dive for longer and reach greater depths than females (Hoskins 2008) so they may have been able to utilise bottom fish better than females. During a mass mortality event of penguins in both New Zealand and Australia following a pilchard die off in 1995 breeding birds switched to a more diverse diet which included bottom feeding fish species (Chiaradia et al 2010, Cavallo et al 2020). The availability of bottom dwelling fish increases the resilience of little blue penguins when their main prey species die off.
45. Little blue penguins are flightless and usually feed within about 25 or 30km of their nests but, if necessary, travel more than 100km (Poupart et al 2017). There are some penguins breeding at Tawharanui and Leigh (Kerry Lukies pers. comm.), and perhaps also at Te Arai, which are within this range of Pakiri Beach. There are probably much bigger numbers of penguins on the predator free sanctuary islands, such as the Hen and Chickens and Little

Barrier that would also use this area. Preliminary results of tracking penguins from Lady Alice Island in the Hen and Chickens group (Kerry Lukies pers. comm) show that birds come inshore to feed mainly around Whangarei Heads and in Bream Bay coming to almost 1 km off the beach. Some birds move further south and two of them foraged intensively off Pakiri Beach as far as Cape Rodney coming as close inshore as 4.5km. This area would probably be more important for penguins breeding on Little Barrier and they could be reasonably expected to feed right across the proposed mine site, also approaching to 1 km off the beach.

### **Working at night**

46. Mr West, in his primary written evidence (4.5.6) suggests working at night might reduce the impacts of sand extraction of fairy terns and other birds. It is probably not necessary to do this to avoid impacts on fairy terns, assuming the area expected to be impacted is small and easily avoided, I do not expect disturbance to be a major issue. Shearwaters and other petrel species are active at night and may also be attracted to lights so could land on the operating vessel and be unable to escape. While it is stated that the use of lights will be minimised, in line with Department of Conservation guidelines (DOC undated), very little is required. I once had a Salvin's prion, a small petrel, come into a bush camp in the Catlins attracted by the light of a single candle (pers. obs.). The problem is especially acute for inexperienced juveniles leaving their nests and it should be noted that Little Barrier Island holds major important breeding colonies for some particularly rare species like the Black Petrel and New Zealand Storm Petrel that could be vulnerable. While neither of these species is as rare as the New Zealand fairy tern, working during daylight might actually be better.

### **Summary**

47. New Zealand fairy terns embody the term "critically threatened" more than any other New Zealand bird species in the category. They do not have a large or moderate population still in rapid decline, that happened over a hundred years ago. They are not restricted to sanctuary islands, all of their breeding habitats are impacted by people, most of them very heavily impacted. Management by the Department of Conservation and public are probably the only reason they are not extinct now but it is a losing battle at present. The productive base at Mangawhai has been eroded since mangrove removal at Mangawhai in 2015 and the actual breeding population has declined from 11 pairs in the 2014-15 season to 8 in 2020-21 but two of these pairs are not fertile. They are, in fact, well on the path to extinction so we are discussing the time window to come up with viable management solutions and any further detrimental change will reduce the time that window stays open.

48. While we may not know just where fairy terns feed offshore we do know, from the observations at the Pakiri nest, that they do, and also that they obtain a moderate proportion of their food there. They have the ability to feed right across the mining site but the proposed mine covers much of the water that is available for them to use and their only means of avoiding it is to stay inshore where the published studies quoted by Mr West and Dr Sivaguru suggest that little feeding actually takes place. The possibility of existing but unrecognised, or further harm to fairy terns from sand extraction suggests to me that this

mining site may be situated in the worst possible place in Auckland from an indigenous biodiversity perspective adding risk to the animal species most likely one to become extinct in the near future. To proceed with granting this resource consent without making any realistic attempt to assess the potential effects of the sand extraction on fairy terns, and also the other “threatened” and “at risk” bird species present, does not make sense.

49. The Auckland Unitary Plan actually has good provisions for biodiversity recognising previous losses to development and having objectives and policies designed to prevent further losses, also taking an evidence-based approach and allowing for uncertainty with a precautionary approach, amongst other things. This should work well for the New Zealand fairy tern. Some provision has already been made with Pakiri Beach identified as an SEA-M2 and the mouths of the Pakiri River, Poutawa Stream and Te Arai Stream all designated as SEA-M1. I presume the concentration of nesting sea and shore birds near the stream mouths is the main reason for this difference. It includes both terrestrial and marine areas but the only marine species specifically mentioned is the New Zealand fairy tern so I presume the offshore extension is specifically intended to benefit them.
50. The knowledge quoted in the description of these SEAs is now old and needs updating as Te Arai Stream mouth is recognised only as a potential breeding site for New Zealand fairy terns while it has been an actual breeding site since 2015. This also means that the alarming decline in productivity and the falling number of breeding pairs since 2015 has also not been known so the true gravity of their current situation has not been taken into account. One of the biodiversity policies (B7.2.2 (3)) is to identify coastal marine areas that fit certain criteria as SEAs and I suggest that it now appropriate to do this for the areas abutting the already designated SEAs at Pakiri Beach and to reconsider the SEAs themselves. To begin with the ranking along the beach should be lifted to SEA-M1 because I find it hard to see anything involving New Zealand fairy terns as robust at present. From the evidence I have presented I think the seaward extent of this SEA needs to be re-visited to see if it is fit for purpose and actually covers the area necessary for fairy terns to survive.
51. In his primary written evidence (4.62) Mr West states that “while there is potential for deleterious effects to occur, the likelihood of this happening is so extremely low that it cannot meaningfully be taken into account.” For New Zealand fairy terns, the consequences of any further adverse effects are likely to be severe so they are an example in point. Regardless of the probability, risk of severe consequences always requires management no matter what the probability is because the potential consequences are always high. The precautionary approach is an appropriate option here but the addendum to the s42A report suggests that a precautionary approach is not required. The name “precautionary principle” suggests that steps should be taken to reduce the risk of adverse effects occurring before they happen and I think this is entirely appropriate here. Monitoring of fairy terns while the dredging activity is taking place is something different, a cautious approach perhaps but surely not a precaution as adverse effects will not be recognised until they are happening or have already happened. This is not appropriate.
52. The little effort taken to properly assess “threatened” and “at risk” bird species in this resource consent application does not sit well with the stated objectives and policies for indigenous biodiversity in the Auckland Unitary Plan but the plan is also quite enabling for the mining of the building materials that are regarded as essential for growth of the city so

there is clearly potential for conflict here. It should not arise because it is clear that important biodiversity values should take precedence (Auckland Regional Policy Statement, policy B7.6.2(4)). With a sand mining consent on the table pushing right up to the edge of the SEA I would expect some requirement to consider whether or not the border is well placed because the birds could cross that border and there could be adverse effects from the dredging that could flow from the mining site into the SEA. Any adverse effects will fall on the breeding colonies on Mangawhai sand spit, on the sanctuary islands in the Hauraki Gulf such as Little Barrier and perhaps elsewhere too.

53. In conclusion I think that sand mining along the Pakiri coast may or may not be detrimental to some “threatened” and “at risk” bird species. The main source of my frustration is that although it is important to have this information, no useful attempt has been made to gather it. The problem is particularly acute for the New Zealand fairy tern but there are other species present that are also worthy of concern. When this information becomes available, we can have some idea of what the real issues are and whether, or not, they can be avoided, remedied or mitigated.

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