

Before the Independent Hearings Panel  
at Far North District Council

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*under:* the Resource Management Act 1991

*in the matter of:* Submissions and further submissions in relation to the  
proposed Far North District Plan

*and:* Vehicle Exclusion Proposal

*and:* **Lucklaw Farm Limited**

Statement of Evidence of Gareth Foley Taylor (Ecology)

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Dated: 22 July 2024

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## **STATEMENT OF EVIDENCE OF GARETH FOLEY TAYLOR**

### **INTRODUCTION**

- 1 My full name is Gareth Foley Taylor.
- 2 I hold a Doctor of Philosophy in Environmental Science, and am a Certified Environmental Practitioner. I have worked as an environmental scientist with a particular focus on environmental management and ecology for over 12 years.
- 3 I am a Director of Collaborations (trading name of Taylor Collaborations Limited) in Christchurch. I have held this position since 2018. Prior to this position I predominantly worked as an environmental consultant, as well as an academic.
- 4 My PhD thesis (conferred in 2013) was entitled 'Management of Sand Beaches for the Protection of Shellfish Resources' which had a particular focus of the impacts of vehicles on beach systems, including flora and fauna (Tuatua being a focal species).
- 5 I am familiar with the submission made by Mr John Gilbert Sturgess for Lucklaw Farm Limited (submitter number S550, S551, S585) on 21 October 2022 and the issues discussed in that submission. I have been engaged by Lucklaw Farm Limited to provide evidence on its behalf.
- 6 I have read:
  - 6.1 Far North District Council (FNDC) – Section 32 Report – Coastal Environment
  - 6.2 FNDC S42A Report - Coastal Environment

### **CODE OF CONDUCT**

- 7 Although this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the code of conduct for expert witnesses contained in part 7 of the Environment Court Practice Note 2023. I have complied with it in preparing my evidence. I confirm that the issues addressed in this statement of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

### **SCOPE OF EVIDENCE**

- 8 In my evidence I will, briefly, address:
  - 8.1 Ecological Values on Puwheke Beach;
  - 8.2 Impacts of Vehicles on Ecological Values at Puwheke Beach;
  - 8.3 Expected Ecological Benefits of a Vehicle Exclusion Zone (VEZ) rule, as Lucklaw Farm Limited have proposed; and
  - 8.4 Residual matters that the Panel may wish to consider.

## ECOLOGICAL VALUES OF PUWHEKE BEACH

- 9 Lucklaw Farm has commissioned a number of studies which I have relied on in preparing this evidence.
- 9.1 A report prepared by Collaborations Limited, authored by myself, that studied tuatua populations at Puwheke Beach.
- 9.2 A report prepared by Boffa Miskell<sup>1</sup> assessing the ecological value of Puwheke Beach in response to Northland Regional Council's plan to include a Vehicle Exclusion Zone (VEZ) on Puwheke Beach summarised the key species found in studies on the beach (hereon referred to as the Boffa Miskell report).
- 10 The Boffa Miskell report identified a number of threatened bird species on the beach, described in the table below:

Species Name	Common Name	Threat Classification (Robertson et al., 2021)
<i>Hydroprogne caspia</i>	Caspian tern	Threatened – Nationally Vulnerable
<i>Charadrius obscurus aquilonius</i>	Northern New Zealand dotterel	Threatened – Nationally Increasing
<i>Larus novaehollandiae scopulinus</i>	Red-billed gull	At Risk - Declining
<i>Sterna striata striata</i>	White-fronted tern	At Risk - Declining
<i>Anthus novaeseelandiae novaeseelandiae</i>	Pipit	At Risk - Declining
<i>Haematopus unicolor</i>	Variable oystercatcher	At Risk - Recovering
<i>Phalacrocorax varius varius</i>	Pied shag	At Risk - Recovering
<i>Circus approximans</i>	Australasian harrier	Not Threatened
<i>Larus dominicanus</i>	Black-backed gull	Not Threatened
<i>Morus serrator</i>	Australasian gannet	Not Threatened

- 11 Additional to this, during my study, I observed Little Penguin (*Eudyptula minor*), which is *At Risk – Declining* conservation status, in the front dune near to the public vehicle entrance in 2020.
- 12 Of the species identified by Boffa Miskell, Northern New Zealand Dotterel were observed with established nests on the upper beach, with Caspian and white-fronted tern also observed roosting in this zone. New Zealand pipit, variable oystercatchers and red billed and black backed gulls were observed in flight, feeding and roosting along the length of the beach.

<sup>1</sup> Boffa Miskell (2022). Puwheke Beach Ecological Values. Prepared for John and Andrea Sturgess on 07/11/2022. Project Number BM220341A. 9 Pp.

- 13 Boffa Miskell also observed three shore skinks (*Oligosoma smithi*), with *At Risk-Declining* conservation status in the upper shore of the beach.
- 14 Native vegetation species was recorded as follows: Pingao (*Ficinia spiralis*), sand daphne (*Pimelea villosa*), sand coprosma (*Coprosma acerosa*) and manuka (*Leptospermum scoparium*) – all classified as At Risk – Declining and native spinach (*Tetragonia tetragonoides*) – classified as At Risk – Naturally Uncommon. The foredune along Puwheke Beach is dominated by Spinifex (*Spinifex sericeus*), with a mix of the above At- Risk species as well as a few other native species e.g., small-leaved pōhuehue (*Muehlenbeckia complexa var. complexa*) and shore bindweed (*Calystegia soldanella*). The dune slack has areas of knobby club rush (*Ficinia nodosa*) and oioi (*Apodasmia similis*) surrounded by sand daphne, sand coprosma, tauhinu (*Ozothamnus leptophyllus*), spinifex, pingao and toetoe. The back of the rear dune is dominated by pōhuehue and bracken, with flax, pohutukawa, native spinach, manuka, toetoe, knobby club rush and sand coprosma.
- 15 The Boffa Miskell report concluded that very high ecological values are present on Puwheke Beach, and current vehicle access is threatening these values.
- 16 This finding has supported the recent implementation of a Vehicle Exclusion Zone (VEZ) on the foreshore of Puwheke Beach under the Northland Regional Plan. The Vehicle Exclusion Zone extends seaward from the Mean High Water Springs (MHWS), as illustrated in Figure 1.

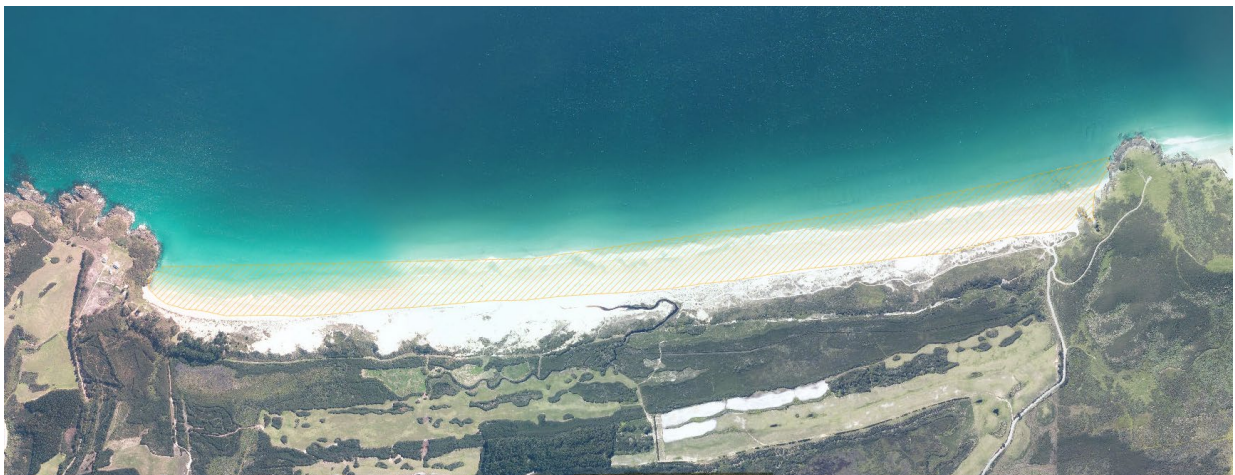


Figure 1 Vehicle Exclusion Zone (yellow hatched area) under the Northland Regional Plan at Puwheke Beach. Sourced from NRC GIS.

- 17 Significant Bird Areas, and Significant Marine Mammal and Seabird Area Overlays are also identified in this area within the Northland Regional Plan. As noted in the NRC Assessment Sheet<sup>2</sup> these areas are established to protect birds identified to be spending life stages on Puwheke Beach above the MHWS.

<sup>2</sup> Ecologically Significant Marine Area Assessment Sheet for Wading and Aquatic Birds: <https://www.nrc.govt.nz/media/vmvp4ain/seas-coastal-and-island-birds-doubtless-rangaunu-and-great-exhibition-bay.pdf>

- 18 The Environment Court Decision<sup>3</sup> associated with the Northland Regional Plan emphasised that working across other agencies is required to 'ensure that the full beach area is managed effectively'

### **IMPACTS OF VEHICLES ON ECOLOGICAL VALUES AT PUWHEKE BEACH**

- 19 Vehicles have been shown to negatively impact on beaches in published academic literature around the world as noted in a review by the Department of Conservation<sup>4</sup>. This review states that whilst a number of studies have focused on shellfish, less research has focused on birds and vegetation. In particular, the review notes that there is a lack of quantitative information or study within the New Zealand context related to vegetation, dunes and birds.
- 20 Impacts on birds are difficult to quantify at a population level, but studies have assessed nest mortality from vehicles. A study by Orchard et al. (2022)<sup>5</sup> deployed artificial nests on a beach with high (approx. 70% tracking) and moderate (approx. 40% tracking) tracking areas and found that 91% and 83% of nests were destroyed respectively. A study conducted on Hooded Plovers, which nest approx. 6m below a dune in Australia<sup>6</sup>, also indicated beaches with 20% of tracks resulted in 81% of nests being destroyed by vehicles over a season.
- 21 Although there is noted to be relatively little literature examining effects on vegetation and dune systems in New Zealand, International literature has identified that use of vehicles resulted in reducing plant cover and height, lowering species diversity and altering community composition<sup>7</sup>. Dunes have been noted to show accelerated signs of erosion<sup>8,9</sup>. I have personally observed such erosion to occur as is documented in my thesis.
- 22 In the context of Puwheke Beach, vehicles are also known to access the beach through Department of Conservation (DOC) managed land area located at the eastern end of Puheke Road (pers. comms Mr Sturgess). Once on the beach vehicle users are then able to access the beach relatively freely (i.e. there are no physical barriers restricting access).
- 23 Up until implementation of the Vehicle Exclusion Zone, users were able to drive up and down the beach for any purpose. The regional planning rules do not allow driving below the MHW. This restriction, if adhered to, would concentrate vehicle use in the

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<sup>3</sup> Decision [2023] NZEnvC 133

<sup>4</sup> La Cock, G.D. (2022) Vehicles on New Zealand beaches: an annotated bibliography of research on physical and ecological impacts. Prepare for the Department of Conservation. 21 Pp.

<sup>5</sup> Orchard, S.; Fischman, H.S.; Schiel, D.S. 2022: Managing beach access and vehicle impacts following reconfiguration of the landscape by a natural event. *Ocean & Coastal Management* 220: 106101.

<sup>6</sup> Buick, A.M. & Paton, D.C. (1989). Impact of off-road vehicles on the nesting success of Hooded Plovers *Charadrius rubricollis* in the Coorong region of South Australia. *Emu*, 89: 159-172.

<sup>7</sup> Hosier, P.E., & Eaton, T.E. (1980). The impact of vehicles on dune and grassland vegetation on a south-eastern North Carolina barrier beach. *Journal of Applied Ecology*, 17: 173- 182.

<sup>8</sup> Thompson, L.M.C., & Schlacher, T.A. (2008). Physical damage to coastal dunes and ecological impacts caused by vehicle tracks associated with beach camping on sandy shores: a case study from Fraser Island, Australia. *Journal of Coastal Conservation*, Vol 12: 67-82.

<sup>9</sup> Anders, F.J., & Leatherman, S.P. (1987). Effects of off-road vehicles on coastal foredunes at Fire Island, New York, USA. *Environmental Management*, 11(1): 45-52.

upper shore (i.e. landward of MHWS). Figure 2 illustrates the disturbance that occurs as a result of the current management in place.

- 24 Though vehicle use may vary day-to-day, the tracking in Figure 2 appears to affect approximately 80% of the area between the MHWS and the dune toe and extends down the beach to the river mouth. All of this area is that which dotterels may seek to utilise to nest and if similar use occurs as per findings of studies in Paragraph 21 this could result in significant impacts on breeding success.



*Figure 2: Photo supplied by Lucklaw Farm showing vehicle tracks on Puwheke Beach both in the dune systems and over the landward beach of the MHWS. Taken 30 May 2024 from Mt Puwheke looking west.*

- 25 A four-wheel-drive track is located towards the rear of the dunes that allows vehicles to traverse the dunes from Puheke Road and enter the beach at multiple points. Due to presence of the river outlet midway along Puwheke Beach, vehicle tracks are most apparent within the eastern dune frontage as can be seen in Figure 3.





*Figure 3 Satellite image (July 2024) of Pwheke Beach showing current tracks in Dune.*

- 26 The Boffa Miskell report identified that vegetation is relatively intact in areas not driven on by vehicles, but the dunes were observed to have flattened and dead plants where vehicles had driven.
- 27 Overall, there is an adverse impact of vehicles on vegetation and this can be exacerbated by the spread of tracks through the dune systems without regulation. The present patterns of tracking on Pwheke Beach between the dune toe and the MHWS line are placing shorebirds at risk of disturbance; particularly in key life stages when nests are present.
- 28 In my opinion, to maintain and protect the very high ecological values associated with dunes, vegetation and birds present on Pwheke Beach, further management of vehicles is required.

#### **BENEFITS OF RELIEF SOUGHT**

- 29 DoC noted that my thesis, conferred in 2013, is the only one in New Zealand which examines effects on biota. Within my thesis I also reviewed internationally available methods for managing vehicles on beaches and found that there were five key legislative methods of beach management; permits, seasonal closures, area designations, zone designations, and complete bans.
- 30 Presently Pwheke Beach would be categorised as a 'zone designation' whereby vehicles are permitted above the MHWS (due to lack of legislative protection) but not below (as per the NRC Regional Plan VEZ).
- 31 Lucklaw Farm seeks relief in the form of provisions that provide for permitted access under certain conditions (see Schedule 1 of Lucklaw Farm' submission). Supporting this

submission is a varied set of provisions from the Bay of Plenty Regional Coastal Environment Plan.

- 32 The provision suggested by Lucklaw Farm would limit vehicle access to Puwheke Beach for those specific purposes listed by 1 to 7 of his drafted provisions, then is only permitted if the conditions (a) to (f) are met.
- 33 With regard to ecological protection, key aspects of these conditions include prevention of contaminants, avoidance of shellfish beds, vegetated areas and bird nesting areas during nesting season, reduce speeds and a requirement to take a direct route to the water from a designated access point (i.e. Puwheke Road entrance). All of these factors are considered to be ecologically beneficial compared to the current management in place at Puwheke Beach.
- 34 Overall I consider the imposition of these rules would be effective in minimising the spread of vehicle use within the beach as would be limited to a direct track between the shore and Puwheke Road entrance; provided compliance is monitored.

### **RESIDUAL MATTERS**

- 35 With respect to Condition (b), I consider this may be difficult to determine and/or enforce as requires knowledge of the location of bird nests and shellfish beds . It may be more beneficial to identify the particular area of the beach where vehicles may be driven. Or alternatively identify a time of year that captures bird nesting season and restricts access during this time..

### **CONCLUSION**

- 36 Puwheke Beach is considered to be of Very High ecological value and supports a wide range of threatened species above the MHWS including nesting birds, vegetation and dune systems.
- 37 The recent introduction of the VEZ by NRC has resulted in vehicles being concentrated above the MHWS which compromises the ecological values in this area. Management of vehicle use on beaches, such as Puwheke, is necessary to reduce the impacts of activities on native flora and fauna.
- 38 Provisions sought by Lucklaw Farm will improve protection for flora and fauna on Puwheke (and other Northland beaches) but limiting the number and spread of vehicles on the beach.
- 39 Condition B could be improved from a user and regulatory perspective through defining a particular area of the beach a vehicle may be used within, or restricting access during nesting seasons.

Dated: 22 July 2024

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Dr Gareth Foley Taylor