**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of the Proposed Waikato District Plan (Stage 1) – Hearing 21B - Landscapes

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**STATEMENT OF EVIDENCE OF GRAEME DENNIS LA COCK FOR THE DIRECTOR-GENERAL OF CONSERVATION**

**20 AUGUST 2020**

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## 1. INTRODUCTION

1.1 My full name is Graeme Dennis La Cock.

1.2 I have been employed as a Technical Advisor Ecology with the Department of Conservation for the past 8 years. Previously I was a Technical Support Officer (Flora) in the Tongariro Whanganui Taranaki Conservancy of the Department of Conservation for 15 years. Before working for the Department, I worked in South Africa for 10 years as a scientist for a conservation agency, and for four years as a technician with an ornithological institute, concentrating on seabird research.

1.3 I have a BSc, BSc Honours and MSc from Rhodes University, South Africa. I have been involved with dune management in South Africa and for the Department of Conservation and have published in the field. I was the Department's representative on the Coastal Dune Vegetation Network (**CDVN**) management committee and am a trustee of the Coastal Restoration Trust of New Zealand, which superseded the CDVN.

1.4 I have authored or co-authored 20 publications in peer-reviewed scientific journals.

1.5 I presented evidence on dunes for the Horizons One Plan and was an expert witness in Environment Court mediation and in council hearings on proposed plan changes for the Horowhenua and Kapiti Coast District Councils. I have also provided technical advice on resource consent applications, including in dune habitats, and provided dune management advice to community groups, council, defence force and Departmental staff.

1.6 Besides dune related evidence I have presented evidence on regional pest management strategies and indigenous logging.

## 2. CODE OF CONDUCT

2.1 I confirm I have read the code of conduct for expert witnesses as contained in the Environment Court's Practice Note 2014. I have complied with the practice note when preparing my written statement of evidence and will do so when I give oral evidence before the Commissioners.

2.2 The data, information, facts and assumptions I have considered in forming my opinions are set out in my evidence to follow. The reasons for the opinions expressed are also set out in the evidence.

2.3 Unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

**3. SCOPE**

3.1 I have been asked to provide evidence on whether dunes and soft coasts should be managed for stability, or whether it is preferable to manage them in their functional state, which often encompasses instability.

3.2 There are two elements to stability that I would like to address:

a) The long-term stability of soft coastal beach and dune systems; and

b) The short-term implications of dune stabilisation.

**4. LONG TERM**

4.1 Beaches and their associated dune systems need space as well as time if they're to function efficiently.

4.2 A 1999 Environment Waikato (Waikato RC) report "Coastal erosion hazard in the Waikato Region", prepared by Jim Dahm, made the following salient points:

a) Coastal erosion is a normal and expected natural process on virtually all coastlines of the world;

b) Beach shorelines fluctuate in position over periods of several years to decades, with periods of erosion and progradation;

c) Dynamic shoreline fluctuations (periods of erosion and accretion with little net shoreline change over time) appear to occur at most beaches in the region;

d) The most significant fluctuations occur in the vicinity of estuary and river entrances and their associated flood and ebb-tidal deltas, with changes of 50-200 m observed;

e) In areas away from the influence of river and estuary entrances, ocean beaches on the West Coast show duneline fluctuations of less than 50 m;

f) Part of the sandy spit on the northern side of the Mokau River entrance fluctuated in position by more than 200 metres in 40 years between 1956 and 1995. The original town layout included a road and several properties on the spit (see figure 7 of report), that are no longer there;

g) This Mokau Spit may be destroyed and rebuilt over periods of centuries;

h) The most notable change has been at Port Waikato, where the main river entrance has migrated northwards by around 1.5 km between 1863 and 1961, with resultant accretion to the south and erosion to the north.

4.3 Dahm makes similar points in article 2.3 of the Coastal Restoration Trust of New Zealand's *Restoration of coastal dunes using native plants* Technical Handbook, including diagrams and photographs of Mokau, Port Waikato and other sites that demonstrate these large fluctuations.

4.4 I've used this report to demonstrate that the coast is dynamic, and over periods of decades may move in and out by up to 50 metres on the west coast, and much more near river entrances and estuaries. The coast needs this room and time to fulfil its natural protective function. It cannot be managed in a stable state.

**5. SHORT TERM**

5.1 In 2014 I was approached for advice on an application to top-dress Mangawhai Spit, because pingao was dying.

5.2 A field inspection revealed that a large area of pingao was dying, yet neighbouring patches were flourishing.

5.3 It became evident that sand fences had been erected to trap all sand coming onto that area of the spit. At the time of the visit there were three fences one on top of the other. No sand had been allowed through for several years.

5.4 The flourishing patches of pingao had a buildup of fresh sand around them, whereas there was no evidence of freshly blown sand at the patch of dying pingao.

5.5 As a native sand binder, pingao requires fresh beach sand to function properly. Disrupting this supply of sand will lead to ill-thrift and death of pingao.

5.6 I've used this example to demonstrate that stability is not a desired state, and that foredune vegetation is adapted to dealing with fresh supplies of sand.

**6. EXECUTIVE SUMMARY**

6.1 I've provided evidence from the West Coast of the Waikato District that the beaches and their associated sand dunes are not in a stable state, and may move up to 50 m over several years to decades in areas not influenced by river mouths, with far greater fluctuations close to river mouths.

6.2 I've also demonstrated that stabilising sites and interfering with the onshore movement of sand will impact on the natural function of native sand binders, and hence the functioning of dune systems.

**7. CONCLUSION**

7.1 I believe I have drawn on material from the Waikato District that demonstrates the long-term natural functional instability of soft shores and dune ecosystems in the Waikato District, and how these shorelines change over decades for locations away from river mouths, to changes over decades to centuries in the case of river mouths, particularly the Mokau and Waikato Rivers.

7.2 I have drawn on my own experiences to demonstrate the short-term implications of stabilising a dune system, and the impact this has on the ability of a native sand binder to fulfil its natural function.

7.3 I therefore believe it is appropriate to manage soft shores and dune ecosystems in the Waikato District in their naturally unstable state, rather than to attempt to manage them in a stable state.

Graeme La Cock

20 August 2020