Marlborough's East Coast - Technical Report

MARLBOROUGH DISTRICT COUNCIL

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Mike Bell – Figure 3 & Figure 4**.**

Marieke Lettink – Figure 5**.**

Chris Wootton – Figure 9**.**

Shawn Gerrity – Figure 14 & Figure 12**.**

Mike Aviss – Figure 18**.**

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1. Introduction

Marlborough's East Coast between the confluence of the Awatere River mouth in the north and the Marlborough District Council (Council) boundary south of the confluence of the Waima/Ure River is described as isolated, ruggedly beautiful and home to a diverse range of plant and animal life. It is also a place where people enjoy walking, bird-watching, cray-potting, fishing, horse trekking, researching, camping, driving 4WDs, riding motorbikes and earning a living from fishing and farming.

The 7.8 magnitude Kaikōura earthquake on 14 November 2016 changed the area by raising 110km of Marlborough's East Coast line up to 6.5 metres, with a 0.5 -2.5 metres uplift in the area between the mouths of the Awatere and Waima/Ure Rivers. The high tide mark shifted as much as 200 metres, leaving more exposed beach. In places where access was previously restricted by tides, it is now possible to walk or drive at any time.

Following the earthquake, a group of long-term beach users and people living in the community raised their concerns to Council about potential impacts from the increase in public use of the beach and particularly the use of vehicles on the beach, reef and dune systems. They formed the East Coast Protection Group (ECPG) which seeks to foster understanding of the biological diversity and cultural heritage of this outstanding natural landscape (ONL) while promoting appropriate use. The ECPG is supported by Council and Department of Conservation (DOC).

The area is valued by a wide range of users for a variety of reasons, some of which are in conflict with each other. In order to establish the values associated with the area and identify potential measures to reduce environmental impacts, a Technical Advice Workshop was held on 23 July 2018. The workshop participants included technical experts from a wide range of disciplines and focused on science, conservation and legal knowledge.

Map 1: Marlborough's East Coast Area between the Awatere River and Waima-Ure River mouths
Source: Council Smart Maps

2. Purpose

The purpose of this report is to collate the information from the Technical Advice Workshop as well as additional information complied after the workshop to be able to inform both the community and Council about the effects of the 2016 earthquake on the East Coast Environment.

3. Scope and structure of this report

3.1. Scope

This report investigates Marlborough's East Coast between the Awatere River mouth and the southern boundary of the Marlborough District south of the confluence of the Waima/Ure River the focus area (Map 1).

The content of this report has been limited to the following topics; landscape, cultural, natural habitats & ecosystems and recreational & commercial use of the East Coast. The earlier versions of this report contained some gaps in the information for some topics. This third version updates and incorporates additional information that fills those gaps that were highlighted in the previous versions.

3.2. Structure

The first section sets the scene before the earthquake to be able to understand what the coast is comprised of, the processes that affected it and the different species found in the range of habitats of the East Coast.

This is followed by a section that describes the effects of the earthquake on the environment. This includes details of the earthquake along with a description of the activities that have occurred since the earthquake. Scientific evidence from research undertaken by the University of Canterbury and the other technical experts that presented at the Technical Advice Workshop is provided with a focus on the known observations and potential threats to recovery and continued presence for each of the values that were discussed at the workshop.

4. Marlborough's East Coast Environment before the 2016 Kaikōura Earthquake

4.1. Landscape

The limestone bluffs and wave cut platforms of the Needles and Chancet Rocks are unique to this coastline. Sites recording the boundary between the Cretaceous and Tertiary geological eras have been identified at Needles Point and at the Chancet Rocks, a Scientific Reserve administered by DOC.

Figure 1: Cape Campbell at low tide, 2014

Figure 2: Chancet Rocks Scientific Reserve, looking northwest

An area of ONL is identified in the Council's Wairau/Awatere Resource Management Plan [Reference Wairau/Awatere Resource Management Plan, Volume 3, Map 225].

In a Landscape Report prepared by Boffa Miskell for the Council in 2015 they described the East Coast as follows:

"The Limestone Coastline has been identified as an ONL due to the exceptional biophysical and associative landscape values and very high sensory landscape values.

The Limestone Coastline provides the greatest visual drama in the south Marlborough landscape. The spectacular rocky outcrops of the Needles and Chancet Rocks along the Limestone Coastline south of Cape Campbell are extremely memorable and display very high levels of naturalness. The State Highway 1 coastal road from the Waima Bridge to the southern point of the district contains high scenic values.

The coastline of this ONL is largely unmodified and very exposed. The area has remote values and access is limited to a few locations, including Ward Beach and a small number of points south of the Waima River. Walks along the sandy shoreline to the impressive limestone outcrops of the Needles and Chancet Rocks are backed by steep terrain where views towards the open ocean are gained. Views from Cape Campbell lighthouse are spectacular, where panoramic vistas of the sweeping curve of Clifford Bay and the southern shores of the North Island are evident. Other than farm-related activity on the land, this coastline is unmodified, with no aquaculture or jetties/ wharves. The area, once visited, is extremely memorable.

Prominent reef areas in the north (including Cape Campbell) give way to extensive sand/gravel shores in the south and large offshore Macrocystis (kelp) beds are also present off this coastline. The coastal cliffs and escarpments have small low indigenous forest remnants and unusual, highly distinctive herbfields with nationally threatened species. The dunes and coastal flats also contain nationally threatened species. The Canterbury Gully dunefield, located just south of Cape Campbell, contains nationally threatened ecosystem types and plant species. The coastal scarps and flats have nationally significant ecosystems, including dunes and salt turfs, and good sequences of native coastal vegetation. Several areas are set aside for conservation of natural values through QEII National Trust covenants."

As a result of Boffa Miskell's assessment the ONL has been refined and extended to include the coast in the Marlborough Environment Plan notified on 9 June 2016.

Map 2: The ONL following the coast from Marfell's Beach to the Waima. Source: Marlborough Environment Plan, Volume 4, Map 9

4.2. The Natural Habitats and Ecosystems

The extensive sweep of gravel beach dividing steep cliffs and ocean along Marlborough's East Coast gives the area a rugged and remote feeling and is home to many species of terrestrial and marine indigenous vegetation and fauna.

4.2.1. Terrestrial Ecosystems

4.2.1.1. Indigenous Vegetation

Tenacious plant communities, including many endangered species, cling to cliffs, escarpments, dunes and coastal flats. Much of the original indigenous coastal forest is long-gone, eliminated by fires, land clearance for farming, introduced browsing animals and invasive weeds. However, the dunes have endured, and one of New Zealand's best populations of coastal mat daisy (*Raoulia hookeri* "coast") survives at Cape Campbell, among several nationally threatened or at-risk plants along the coast. These include coastal tree broom (*Carmichaelia muritai*), a local endemic very rare in the wild, found only at Clifford Bay and in shingle fans south of Kekerengu.

Over half of the coast (28.5km of the total 48.5km) from the Awatere to the Waima/Ure mouth is recognised as ecologically significant. Significant Natural Areas (SNA) on private land have been identified under the Resource Management Act 1991 including Mussel Point, Cape Campbell, Canterbury Gully, Booboo Stream, Long Point, Weld Cone, The Needles and Mirza Creek/Waima. North of Marfells Beach, Recommended Areas for Protection (RAP's) identified on private land under the Reserves Act include Lake Grassmere dunes, the Clifford Bay Coast, Blind River mouth, Awatere River mouth and Station Creek. Some of these sites have been fenced off, formally protected and restoration has occurred by replanting native species.

Figure 3: Banded dotterel

Figure 4: Variable oystercatchers

Figure 5: Marlborough mini gecko

Figure 6: Elephant seal June 2018

4.2.1.2. Fauna

Birds

Waders including wry bills and Caspian terns (both Nationally Vulnerable) black fronted terns (Nationally Endangered) and South Island pied oystercatchers (At Risk) migrate along this coast, roosting or congregating on coastal platforms and exposed reefs outside of the breeding season.

Banded dotterels (Nationally Vulnerable) and variable oystercatchers (Declining) nest in coastal pea gravels between Cape Campbell and the Ure/Waima.

Little penguins, white fronted terns and red billed gulls (all At Risk) are resident breeders along this coast.

Thousands of gulls and terns congregate here to roost and feed all year round. Fiordland crested penguins (Nationally Kaikōura Vulnerable) and hoiho (yellow-eyed) penguins (Nationally Endangered) sometimes visit. Thousands of Hutton's shearwaters (Nationally Vulnerable) feed in the breakers along the coast. Various seabirds would wash up, dead or alive, after severe storms.

Reptiles

A significant lizard habitat runs the length of the coast. Geckos and skinks are fairly common, especially among log debris which edges the land on the interface between grass and gravel and also on cobble strand (sand and gravel bars).

Species known to be in the focus area are Waiharakeke grass skink, Marlborough mini gecko, Raukawa gecko, and perhaps the rarer Marlborough spotted skink, (At Risk – Declining)

Reptiles need cover (rocks, driftwood etc) and vegetation, for shelter and protection from predators, and a flood-free area above high tide not impacted by people. Favoured native plants – Muehlenbeckia and Coprosma species, grasses and sedges (including pīngao and spinifex) -are also important requirements for reptiles to thrive in this area.

Invertebrates

Host plants are also essential to invertebrates including declining numbers of red katipo in dunes south of Cape Campbell. Specialist dune species *Pimelea prostrata* and raoulia mat daisies provide a home for endemic species including the nationally endangered "Cape Campbell" Pimelia looper moth and more widespread Pimelia leaf roller. The area also supports high numbers of large indigenous coastal sand invertebrates including the seashore earwigs, black cockroaches and sand scarab beetles.

4.2.2. Marine Ecosystems

Exposed and undersea reefs extending south from Cape Campbell are rich in biodiversity, being at the southern end of Cook Strait. More than 200 species come and go over the course of a year. These include various limpets, chitons, topshells, mussels, barnacles, sponges, ascidians and bryozoans – some newly discovered.

Numerous seaweeds including bull and giant kelp grew in inter-tidal channels and pools and sub-tidal reef structures providing a rich habitat for multiple species including abundant rock lobsters and paua.

4.2.2.1. Marine Mammals

Dusky dolphins swim by, rounding Cape Campbell/Te Karaka, on an annual seasonal migration between the Kaikōura coast and sheltered shallow waters of the Marlborough Sounds. Nationally Endangered Hector's dolphins live and breed here, protected by the Clifford Bay Marine Mammal Sanctuary. Humpback whales, which frequent deep undersea canyons, and southern right whales (Nationally Vulnerable), pass through on their northward winter migration, while sperm whales, and Orca (Nationally Critical) have also been located along the coastal stretch.

Historically the stretch of coast has been a haul-out area for fur seals which are now becoming more abundant again, compared with 10-20 years ago. Elephant seals are making more frequent visits to the coast line and one or two have bred in the area, which is a rare event on the New Zealand mainland. It is also known that Leopard seals stop on this coastline to rest.

All marine mammals are protected under the Marine Mammals Protection Act 1978 and the Marine Mammal Protection Regulations 1992. The Regulations require people on foot to stay at least 20 metres away from seals and sealions, and vehicles to be kept 50 metres away. Keeping vehicles 50 metres away from some seal haulouts is close to impossible at Cape Campbell, as is keeping 50 metres away from an elephant seal pupping on the beach.

The offshore Clifford and Cloudy Bay Marine Mammal Sanctuary has been established to protect Hector's Dolphins from acoustic noise. Its boundaries extend from Cape Campbell to an offshore point in a direct line to Tory Channel/Kura Te Au. The Sanctuary covers 142,716ha and 338km of coastline, to the high tide mark (Mean High Water Springs, MHWS). The boundaries of the sanctuary are shown on a map in Appendix 1.

4.3. Physical Processes

The coast is shaped by ocean currents and gale force winds. Ventifact stones in the area are evidence of the long term effects of high winds. Winds also help create high dunes by moving large volumes of sand inland.

4.4. Natural Hazards

The potential natural hazards for Marlborough's coastline are seismic activity, tsunami and climate change.

4.5. Cultural

Māori have lived along the East Coast from the start of human settlement of Aotearoa -New Zealand. Otago University archaeologist Chris Jacomb described a site at Mussel Point as nationally unique and highly significant, holding evidence of the three main stages of Māori occupation. The deepest geomorphic and soil sediment layers contains artefacts related to the moa hunting and processing era (approximately 1300-1400 AD), the middle layer was deposited during the transitional phase between moa-hunting and the upper deposit is typical of the" classic phase" of settlement.

There are other Māori ancient pa sites, ovens and middens in the area. Recent beaching of Kaha the sperm whale – considered an ancestor to Māori -on Marfell's Beach highlighted the depth and complexity of iwi connections to this stretch of Te Tau Ihu coast. Ngāti Kuri/Ngāi Tahu have mana whenua, Rangitane and Ngāti Toa and Te Atiawa have long-standing connections with the area.

4.6. Recreational and Commercial Use

The area has a long history of occupation, recreational and commercial use.

Figure 7: Historic photo of Cape Campbell lighthouse, looking towards Marfells Beach

Public access to the East Coast is limited to a small number of access points. These are shown on the Vehicle Access Maps in Appendix 2. Marfells Beach recreation reserve and Ward Beach are where most public access the area. The camp ground at Marfells beach is used by locals and visitors year-round. Surf-casting for fish and bird-watching are popular and this is a setting-off point for a popular 6km walk to the lighthouse at Cape Campbell/Te Karaka.

Figure 8: Campervan Marfells Beach

The lighthouse that stands today started operating in 1905, painted with black and white strips to stand out from the white hills behind. People who brave the wind to climb the steep steps to the Cape Campbell lighthouse are rewarded with views taking in the sweeping curve of Clifford Bay to the north and on a clear day, the southern shores of the North Island.

Figure 9: Horses near Cape Campbell lighthouse

Vehicle access on formed private roads to Cape Campbell Lighthouse is through farmland and is only accessible with the owners' permission. There are cottages near the lighthouse on private land which are rented as holiday accommodation.

Day and overnight visitors to the Cape enjoy walking, mountain-bike riding, horse-trekking, taking photos and viewing marine wildlife and seabirds in a spectacular landscape.

The Cape area is a popular place for people to fish, gather pāua and other shellfish and set crayfish pots. Access for these recreational food gatherers is via the beach from Marfells Beach using four wheel drive motorbikes.

Ward Beach is another popular place for locals and tourists to visit. It is the main access point for the local commercial crayfishing industry where they launch their vessels directly from the beach. A small private campground for self-contained vehicles is located at Ward Beach. The area is used for surf-casting, viewing wildlife including birds and seals and walking to Chancet Rocks. There is also a designated area for dog walking/exercising at the road end. The maps in Appendix 3 show the locations of these recreational uses.

High tide prevented people from walking or driving along the foot of bluffs at Mussel Point between Marfells Beach and Cape Campbell. Prior to the earthquake, rocky headlands prevented all vehicles other than ATVs from using the beach between Mussel Point and Long Point (about 11km south of the Cape), and access was not possible for any vehicle between Long Point and Chancet Rocks. The Vehicle Access Maps in Appendix 2 Appendix 2 show the use of the coastline by ATV and 4WD vehicles before the earthquake.

Back from the beach, agriculture becomes important. Grapevines grow on terraces at the top of high bluffs extending from the Awatere mouth to Lake Grassmere, where half of New Zealand's salt is produced. Sheep and cattle graze on extensive dryland farms extending back from the coast, from Cape Campbell south.

5. Effects following the 2016 Kaikōura Earthquake on Marlborough's East Coast Environment

5.1. Earthquake Details

GNS Science described the earthquake as follows:

The Kaikōura earthquake occurred just after midnight on the 14th November 2016. The M_W 7.8 earthquake initiated at ~15 km depth and ~4 km south of the north Canterbury rural township of Waiau, located 32 km inland from the coast and 60 km southwest of Kaikōura Peninsula. The Kaikōura earthquake, which lasted for ~ 2 minutes, was unprecedented in its complexity, propagating 170 km towards the northeast along a sequence of >20 faults. Fault surface rupture field surveys revealed the largest horizontal displacements of up to 12 m along the Kekerengu fault and vertical movement of up to 9 m on the Papatea fault.

The Kaikōura earthquake also generated more than 10,000 landslides over an area of about 10,000 km^2, several hundred of these occurred along the coastal slopes.

Kaikōura earthquake also generated more than 10,000 landslides over an area of about 10,000 km^2, several hundred of these occurred along the coastal slopes.

The coastal deformation that occurred in the Kaikōura earthquake is the most highly variable observed in any global earthquake in modern times. Along 110 km of coastline, the vertical displacement ranged from -2.5 to 6.5 m. GNS measured the coastal deformation using a combination of field surveying, satellite measurements and differencing between pre-and post-earthquake high-resolution topographic surveys. They defined the coastal stretch impacted by the earthquake as the region from Haumuri Bluff to Cape Campbell (a straight line distance of 110 km) then 80 km (73 %) of the coastline underwent uplift, with 48 km (44 %) undergoing uplift of > 1 m. Around 28 km (25%) underwent a minor amount of subsidence (<0.5 m), with only a very localised area (2 km around the Kekerengu fault) undergoing > 1 m subsidence. Only a very minor stretch (3 km, 2%) of coastline around Peketa was not impacted by coastal deformation. The entire Kaikōura Peninsula and much of the coastline north and south of the Peninsula was uplifted by between 0.8 and 1 m. Uplift of the Peninsula and the surrounding area is attributed to an entirely offshore fault called the Kaikōura Peninsula fault. Two strands of the Papatea fault cross the coastline at Waipapa Bay and between these faults the land was uplifted 5 -6 m, creating a new rocky coastal platform extending 200 -300 m offshore from the pre-earthquake coastline.

The coastal landforms of the Kaikōura coast attest to periodic sudden uplift in earthquakes, evidence of these events is preserved by uplifted beaches, also called marine terraces, that fringe many parts of the coastline from Oaro to Cape Campbell. These marine terraces are the subject of ongoing studies at GNS Science as they seek to understand how often large earthquakes like the 2016 earthquake occur.

Further information about the earthquake is available from the Geonet website:
https://www.geonet.org.nz/earthquake/story/2016p858000

5.2. Actions following the earthquake

5.2.1. Central Government Intervention

Immediately after the Kaikōura earthquake, the Ministry for Primary Industries (MPI) stopped all fishing for three months until research could be conducted. Collection of shellfish and seaweed was prohibited between Marfells Beach and the Conway River in Canterbury, out to four nautical miles. The closure did not apply to the rock lobster fishery which came through the quake in relatively good shape.

5.2.2. Community Group Formed

Following the earthquake, a group of long-term beach users and people living in the community were concerned about the potential impacts from the increase in public use of the beach and particularly the use of vehicles on the beach, reef and dune systems. They held their first meeting in Ward on 16 February 2017. The East Coast Protection Group (ECPG) was officially formed on 29 May 2018. Council and DOC are technical advisors to the group.

Outputs of the ECPG include:

- Production of an information brochure (Appendix 4)
- Education including signs.
- Predator control programme promoted.
- Letter to the Minister of Conservation and Land Information on 21 May 2018.

5.2.3. East Coast Protection Group -Technical Advice Workshop

On 23 July 2018 Council and DOC convened an expert group to provide advice on the biodiversity and ecological values as well as the historical and recreational context. The purpose was to determine the threats from human activities and identify the values of the East Coast environment. A secondary purpose was to identify potential measures to reduce the environmental impacts where identified.

Notes from the workshop are recorded in Council Record Number: 18158708.

Table 1: Technical Experts that presented at the Technical Advice Workshop

Area of expertise	Expert	Organisation	Topic
Biodiversity and ecosystems.	Simon Moore.	DOC.	Overview of values and impact from vehicle access on flora and fauna.
	Chris Wootten.	DOC.	Overview of values and impact from vehicle access on flora and fauna.
	Peter Hamill.	Marlborough District Council.	Advice on Ecologically Significant Marine site and SNA sites.
Coastal/Marine systems.	Professor David Schiel, Tommaso Alestra, Shawn Gerrity.	University of Canterbury.	Advice on the functioning of the east coast marine system and any threat posed by public access including vehicle (4WD and quad) use on beaches and rocky reefs.
Dune systems.	Peter Williams.	Landcare.	Advice on rare ecosystems, values and potential/actual impacts from public access (4WD and quad).
Entomologist.	Ian Millar.		Advice on invertebrates.
Herpetologist.	Marieke Lettink.		Advice on lizards.
Marine Mammals.	Mike Morrissey.	DOC.	Seal counts.
Public access.	Penny Wardle, Geoff Holgate.	Walking Access Commission.	Advice of walking access legal entitlements for beach access.
Statutory Obligations and Legal.	Kaye McIlveney.	Marlborough District Council.	Advice and legal overview of land tenure and jurisdiction including Council policy options.
	Chris Wootten.	DOC.	DOC's vision, Iwi as Treaty Partner.
Wildlife.	Mike Bell.	Ornithological Society.	Overview of threatened and endangered fauna (coastal birds), breeding and feeding habitats, spatial locations and risks/impacts from public access.

5.2.4. Non-regulatory initiatives

The recreational 4WD users volunteered a Code of Practice for their users. This was published in the Fishing and Hunting paper on 11 December 2018 (Appendix 5).

5.3. The Natural Habitats and Ecosystems

5.3.1. Terrestrial Ecosystems

Observations:

- At the old interface between storm beach and pasture, lizards live among washed up logs which will eventually rot down and disappear. Lizards will need to relocate to new habitat as it establishes further down the beach.
- *Pimelea prostrata*, Raoulia mat daisies and a sprinkling of grasses growing amongst sand provide habitat for the Pimelea looper moth and Pimelea leaf roller. For these and other creatures to survive, this zone needs to move down into the new storm beach area once it has collected enough driftwood to support them.

5.3.1.1. Dunes

Dunes are recognised in New Zealand as Naturally Uncommon Ecosystems as many have been lost, or modified due to development and cultivation. The Cape Campbell dunes (which includes active dunes, stable dunes, dune deflation hollows and beaches), have escaped development other than for farming, by reason of their remoteness, and as a result, they still hold important populations of indigenous species.

Observations:

The dunes have now been uplifted and moved further from the influence of the sea. The log debris which currently edges the land along the interface between grass and gravel are providing a home for plenty of lizards. Eventually vegetation will cover them over. The new logs which are being washed up on the beach have to accumulate in order to provide this habitat in the future [Peter Williams – Landcare Research].

Potential Threats:

- Vehicles are disturbing the new debris.

5.3.1.2. Indigenous Vegetation

The significant indigenous vegetation on Marlborough's East Coast consists of mainly specialist dune species that are declining or threatened due to the decline in the amount of natural dune habitat in New Zealand. This coast, because of its remoteness, is less modified than many other areas of dune habitats in the region and still contains some areas of original native dune vegetation.

The indigenous vegetation of the eastern coastal area has been modified extensively since settlement. Most of the coastal forest cover has now been lost due to many centuries of burning, and more recently cultivation and grazing. The indigenous dune vegetation was also badly affected by this but was able to survive in pockets as some of the coastal areas were inaccessible and less suitable for agriculture.

In the last 40 years the loss has been exacerbated by the spread of an introduced sand binding plant, marram grass, which aggressively takes over the dunes, out competing and smothering indigenous sand plants. At the same time the use of the east coast by All Terrain Vehicles (ATV's) has slowly increased in conjunction with more people owning this type of vehicle. Prior to November 2016, this activity was restricted to up to two hours either side of low tide. More recently, following the uplift caused by the 2016 Kaikōura earthquake, ATV's are now joined by 4WD vehicles in ever increasing numbers and at virtually all tide levels. The impact of vehicles using the coast is threatening the vestiges of native plants that remain, by crushing and killing plants. There is obvious sign of vehicles damaging spinifex runners and mat daphne plants on Marlborough's east coast.

Marram grass now dominates the dunes, with only about seven pockets of indigenous dune vegetation remaining where you can find threatened species, such as, pingao, spinifex, sand tussock, and some

special shrubs such as *Raoulia* mat daisy, sand *Coprosma* and mat daphne, *Pimelia prostrata.* All of these dune and beach plants are vulnerable to being crushed by vehicles. Many of them support endemic bird, invertebrate and reptile populations, such as banded dotterels, katipo spiders, looper moths and waiharakeke grass skinks. Many of these animals are often also endangered and are also easily damaged or killed by being driven over.

Following the 2016 Kaikōura earthquake, there are large areas of new, uplifted beach and dune that are gradually being invaded by introduced marram. Native species, such as spinifex, *Raoulia* and New Zealand iceplant, are also appearing where there is a nearby seed source, but the marram will quickly dominate them if allowed to. If the marram was controlled, and beach disturbance was minimised, the native sand species should establish and become dominant again. Then natural beach communities would prevail, once again providing habitat for banded dotterels, skinks and other beach fauna. This process could, and should, be enhanced with a planting programme.

Indigenous Vegetation values of East Coast, Awatere to Waima:

The following observations are excerpts from Councils' SNA monitoring and survey reports from the east coast.

Awatere Mouth

Coastal mat daisy (*Raoulia* aff. *hookeri*) Nationally Threatened.

Station Creek Mouth

Clematis quadribracteolata and sea holly (*Eryngium vesiculosum*), both listed as At Risk, Naturally Uncommon.

Otuwhero (Blind River) Mouth

Best example in the ED of an ephemeral stream with semi-ntural vegetation. Largest area of saltmarsh ribbonwood in the ED. *Mimulus repens* native musk Nationally Threatened.

Clifford Bay Coast

Largest area of Spinifex in the district. Pingao and coastal mat daisy (*Raoulia* aff. *hookeri*) all Nationally Threatened.

Lake Grassmere/Kapara Te Hau sand dunes

Sand tussock, pingao and coastal mat daisy (*Raoulia* aff. *hookeri*) all Nationally Threatened.

Mussel Point

Shrubby tororaro and sand tussock are nationally threatened. Spinifex is Regionally Uncommon.

Cape Campbell

The flora and vegetation both have special features. The abundance and vigour of the coastal mat daisy (*Raoulia* "*hookeri* coast") make it among the best populations in New Zealand. So too for shrubby tororaro (*Muehlenbeckia astonii*), which is listed as Threatened, Nationally Endangered. Also present are *Muehlenbeckia ephedroides* and sea holly (*Eryngium vesiculosum*), both listed as At Risk, Naturally Uncommon, and sand tussock (*Poa billardierei*), listed as At Risk, Declining.

Canterbury Gully

On the dunes, sand tussock, pingao and mat daisy are nationally threatened species, and sand coprosma and prostrate matagouri are regionally notable. There is a lone bush of shrubby tororaro (*Muehlenbeckia astonii*, nationally threatened) uphill above the fenced area and a strong population of *Muehlenbeckia ephedroides* (also nationally threatened) on the beach ridge just north of the stream outlet on the adjacent property.

Boo Boo Stream

No rare plants are known to be present. However, coastal wetlands are listed as Nationally Rare and At Risk.

Homestead Coast
Important features include the north-eastern limit of *Pachystegia*, scattered patches of pingao, two ngaio trees, dense manuka, flax scrub, herbaceous papa cliff plants, limestone bluff plants including possible local endemics. One *Muehlenbeckia astonii* grows just south of the Canterbury Stream. Marram in particular appears to be invading coastal grassland and herb-field dominated by *Pimelea* and *Raoulia.* sea holly (*Eryngium vesiculosum*), is listed as At Risk, Naturally Uncommon.

Chancet Rocks
Marlborough rock daisy is well established on the stacks; little else can cope with the conditions. There is a large New Zealand fur seal colony using the beach, the new coastal platform and the flat. Mat daisies (*Raoulia* spp.) (Nationally threatened) and prostrate daphne (*Pimelea prostrata*) occur in places and are beginning to colonise raised gravel areas. There is a strong population of sand tussock (Nationally Threatened) both north and south of the Rocks, and some spinifex at the Rocks.

Weld Cone
On the new quake-raised beach land native and exotic plants are vying for the open ground. The main native colonists are mat daisies, prostrate daphne, shore convolvulus and (surprisingly) native iceplant. New Zealand lilac (*Heliohebe hulkeana*) which occurs near the river mouth, although not uncommon, is restricted in distribution and appears to be declining. Pingao is now a rarity on the South Marlborough coast.

Needles Point
Pingao, sand tussock and coastal mat daisy are all listed as Nationally Threatened. The population of mat daisy is huge, possibly among the largest in the South Island, if not the entire country.

Mirza Stream/Lulworth
Plants of note are coastal mat daisy (*Raoulia* aff. *hookeri*) and pingao, both Nationally Threatened, Marlborough rock daisy (*Pachystegia insignis*), and mat daphne (*Pimelea prostrata*). The deflated dunes are accessible to the coast and have been ridden over extensively in places.

A map of the indigenous vegetation locations is provided in Appendix 6.

Table 2: Indigenous Vegetation

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat Type	Location on the coast Appendix 6	Observations	Potential Threats
Coastal mat daisy (*Raoulia hookeri* "coast") Coastal mat daisy (*Raoulia hookeri* "coast") growing with *Pimelia* mats and sand tussock.	*Raoulia* aff*. hookeri* grows in coastal sand dune areas, forming very fine and dense growths, often in association with *Pimelia* mats and sand tussock. These compact growths from large amorphous cushion-like masses with only the growing tips visible above the sand. Due to their shape and form, the plant clusters resemble sheep from afar, this giving them their alternate name, vegetable sheep.	At Risk-Declining.	Largest population of this threatened species in the South Island, possibly NZ.	Open stable sand dune and pea gravel.	The Needles, Cape Campbell, Canterbury Gully, Long Point, Murza Stream.	No impact from the earthquake other than vehicles being able to access its habitat, especially at Mirza Stream, the Needles and Long Point. This species is protected at Cape Campbell and Canterbury Gully by farm boundary fences.	Loss of dune habitat from development and cultivation. Competition from marram grass and other invasive weeds. Damage by vehicles driving on beaches and dunes.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat Type	Location on the coast Appendix 6	Observations	Potential Threats
Coastal tree broom (*Carmichaelia muritai)*	An attractive endemic tree broom only found in coastal South Marlborough, in Clifford Bay and at Parikawa.	Nationally Critical.	One of only two known populations in New Zealand. Small population due to historical clearing of vegetation for farming.	Dry coastal cliffs.	Coastal cliffs of South Marlborough including Clifford Bay.	Destabilising of cliff habitat and coastal erosion may impact habitat.	Coastal erosion. Browsing by goats and other ungulates. Fire.
Pingao (*Ficinia spiralis*) 	Golden sand sedge is one of the major native sand binding plants suited to sand dunes. Used by Māori for weaving tukutuku panels and fine kete.	At Risk-Declining.	Scattered and declining in the region. Is now rarely found but was once abundant.	Mobile sand dunes especially foredunes which it is suited to.	Scattered Cape Campbell to Waima River, including Cape Campbell Canterbury Gully, Long Point, The Needles, Murza. Above high tide.	No impact from the earthquake other than vehicles being able to access its habitat, especially at Mirza Stream, The Needles and Long Point. This species is protected at Cape Campbell and Canterbury Gully by farm boundary fences.	Loss of dune habitat from development and cultivation. Competition from marram grass. Browsing by cattle and rabbits. Damage by vehicles driving on beaches and dunes.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat Type	Location on the coast Appendix 6	Observations	Potential Threats
Hinarepe or sand tussock (*Poa billardierei)* 	Similar to silver tussock only smaller and confined to the coast.	At Risk-Declining.	Now restricted to populations at Canterbury Gully and Rarangi. Small isolated populations.	Open stable sand dune terraces and dune hollows	Canterbury Gully.	No impact from the earthquake other than vehicles being able to access its habitat. This species is protected at Cape Campbell and Canterbury Gully by farm boundary fences.	Competition from marram grass and other invasive weeds. Browsing by cattle and rabbits. Damage by vehicles driving on beaches and dunes.
Kowhangatara (*Spinifex sericeus*) 	The most important remaining native sand binding plant in Marlborough, but only scattered populations remain.	No threatened status, however becoming scarce in Marlborough.	Declining in Marlborough due to marram domination and browse by cattle and rabbits.	Mobile sand dunes especially the storm high tide faces.	Clifford Bay, Marfells Beach, Mussel Point, Cape Campbell, Canterbury Gully, Long Point.	Uplifting and new dune creation is giving spinifex an opportunity to colonise new areas. Vehicles are able to access its habitat.	Competition from marram grass. Browsing by cattle and rabbits. Damage by vehicles driving on beaches and dunes.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat Type	Location on the coast Appendix 6	Observations	Potential Threats
Sand coprosma *(Coprosma acerosa)* 	Sand coprosma is a tight, low growing bush. Berries are important gecko food.	At Risk-Declining.	Only two populations are known in the region.	Stable sand dunes and dry country.	Canterbury Gully and Cape Campbell Farm.	No impact from the earthquake other than vehicles being able to access its habitat. This species is protected at Cape Campbell and Canterbury Gully by farm boundary fences.	Loss of dune habitat from development and cultivation of its habitat. Competition from marram grass. Browsing by rabbits.
Sea holly (*Eryngium)* 	Sea holly is a small prickly endemic coastal herb.	Nationally Vulnerable. Caused by loss of dune habitats to development and cultivation and competition with introduced marram grass.	Near Long Point.	Coastal turfs.	Scattered along the coast.	No impact from the earthquake other than vehicles being able to access its habitat.	Loss of dune habitat from development and cultivation. Marram grass and pasture grasses weeds invading its habitat. Browsing by rabbits and sheep.

5.3.1.3. Fauna

In this section information is provided on birds, reptiles and invertebrate. A map of all the fauna locations is provided in Appendix 7.

Birds

Observations:

This stretch of coast is very important for coastal waders, terns and gulls. Many different wading bird species, both native and migratory, from within New Zealand and internationally use the coast in summer and winter. Maps 3 and 4 below showing the key wintering and summer sites were provided by Mike Bell from the Ornithological Society at the Technical Advice Workshop.

Sites for large numbers of breeding and roosting gulls and terns are the Awatere River mouth, the Waima/Ure River mouth and Lake Grassmere/Kapara Te Hau where large flocks roost over night after foraging out at sea. Cape Campbell is also highlighted as birds will stop off and roost there on their journey back to Lake Grassmere/Kapara Te Hau, but large congregations can occur anywhere along the coast. Lake Grassmere/Kapara Te Hau is a key site for birds both summer and winter and there are several links between all of the sites along the coastline. Lake Grassmere/Kapara Te Hau is integral to it as the whole stretch of coast is one ecosystem for birds as they move around so much to feed.

There is a migration route up the coastline used by wry bills and South Island pied oystercatchers and some of them will stop off in the area, while many continue north after resting.

There are three areas with particularly high numbers of banded dotterel and the variable oystercatcher; south of Cape Campbell (at the Airstrip), Long Point and north from the Waima/Ure all the way to Ward Beach. These birds nest in the pea gravel areas and feed their chicks on the beach.

The Ornithological Society is carrying out ongoing bird surveys in the focus area.

Map 3: Bird Wintering Sites

Map 4: Bird Summer Sites

Potential Threats:

- Predation
- Loss of habitat as a result of the earthquake.
- Damage of habitat by vehicle traffic and providing tracks for predators.

Table 3: Indigenous Birds

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat	Breeding areas Appendix 7	Observations	Potential Threats
Banded dotterels *(Charadrius bicinctus)* 	Endemic wading bird which nests on the coastal pea gravel habitat and beaches as well as inland on braided rivers.	Nationally Vulnerable. Caused by predation by introduced predators, loss of habitat to development and disturbance by people in the species nesting habitat.	Spread along the length of the East Coast on areas of pea gravel and especially near fresh water seeps, ponds or streams.	Nest above the high tide mark. Feed on hoppers and invertebrates on wet sand just above the surge zone.	Important breeding areas along the Cape Campbell Coast include Mussel Point, the Airstrip, Long Point, Ward Beach to Chancet Rocks and Waima River to The Needles. Dotterels defend their territory during the breeding season.	No impact from the earthquake other than vehicles being able to access its habitat.	Predation by introduced mammals. Disturbance of habitat by people and vehicles.
Variable oystercatchers *(Haematipus unicolour)* 	The only oystercatcher which breeds on the coast in New Zealand. Occupy the coast all year round.	Recovering.	Scattered along the length of the coast in relatively low numbers, nowhere common.	Nests on sand and pea gravel beaches and feeds on the water's edge. Adults also feed on reef platforms.	Nest on gravel beaches. Defend their territory during the breeding season.	Effected by uplift of reef feeding habitat which is now devoid of marine life. Nesting habitat affected by vehicle disturbance.	Predators (dogs). Vehicles.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat	Breeding areas Appendix 7	Observations	Potential Threats
Pied shags *(Phalacrocorax varius)* 	A large coastal shag which nests in colonies in trees on or near the coast. They feed along the coast on small pelagic fish.	Recovering.	Shag rookeries are found at Marfells Beach and at Long Point. Away from these places they are often seen on beaches drying their wings or flying up and down the coast between the sea and their nests.	Nest in trees behind the beach. Roost on sandy beaches all along the coast, but especially Marfells Beach, Mussel Point, Cape Campbell, Canterbury Gully, Boo Boo Stream, Long Point, Ward Beach/Chancet Rocks, the Needles, where they feed.	High numbers along the coast in suitable trees, supported by a good natural food resource nearby.	No direct effect from the earthquake other than increased disturbance of them while they roost on the high tide mark on sand and gravel beaches.	Disturbance on the beach which forces them to flee while still drying their wings or digesting food.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat	Breeding areas Appendix 7	Observations	Potential Threats
White fronted terns (*Sterna striata*) 	The most common endemic tern nesting around the coast in New Zealand, there has been a marked decline over the last 40 years.	At Risk-Declining.	Large numbers of these terns associate with red billed gulls, and breed and feed along this coastline.	Feeds on pelargic fish in the surf and offshore along this coast all year round, often with red billed gulls. Roosts on the rocks and sand all along the coast.	Nests in different sites in different years, often in association with red billed gulls. Nesting on beaches at Cape Campbell and Waima River Mouth. There is often a large colony at Lake Grassmere/Kapara Te Hau. There have also been colonies at the Waima/Ure, Flaxbourne and Awatere River mouths.	More prone to disturbance now that more people use the coast environment.	Caused by predation of eggs, chicks and adults by introduced mammals and disturbance in their nesting and roosting habitats.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat	Breeding areas Appendix 7	Observations	Potential Threats
Black-fronted terns *(Chlidonias albostriatus)* 	The most common inland breeding tern in New Zealand. They spend summers on braided rivers nesting and then migrate to the coast after breeding.	Nationally Endangered.	Overwinters on the coast and at Lake Grassmere. Feeds along the coast and roosts at Mussel Pt, Cape Campbell.	Feeds on plankton offshore and roosts on the coast with other tern and gulls when not feeding.	Nests inland on braided rivers. Uses the coast in the winter season, roosting on rocks and sand and at Lake Grassmere after feeding along the coast.	More prone to disturbance now that more people use the coast environment.	Caused by predation by introduced mammals and disturbance in their nesting habitat.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat	Breeding areas Appendix 7	Observations	Potential Threats
Red billed gulls *(Chroicocephalus novaehollandiae scopulinus)* 	The most common gull on the New Zealand coast. Recently the largest colonies have exhibited a marked decline in numbers.	At Risk-Declining.	Nesting on beaches at Cape Campbell and Waima River Mouth. There is often a large colony at Lake Grassmere/Kapara Te Hau. There have also been colonies at the Waima/Ure, Flaxbourne and Awatere River mouths.	Nests on beaches as well as rocks. Feeds mostly along the coast on krill.	Large flocks congregate along the coast, roosting on the beach, rocks and islets after feeding along the coast. They nest on rocks at The Needles and Ward Beach. Roosting in groups of up to thousands on Marfell's Beach, Mussel Point, Cape Cambell, Long Point, Chancet Rocks, The Needles and Waima River mouth.	Unknown effects from the earthquake.	Risks are mostly from predation from introduced mammals. Changes in food supply due to climate change.

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat	Breeding areas Appendix 7	Observations	Potential Threats
Little penguins (*Eudyptula*) 	The world's smallest penguin, found all over New Zealand.	At Risk-Declining.	Found in low numbers along the coast from Cape Campbell to Wharanui but not well documented. Nocturnal so can be difficult to detect in remote places.	Nests in burrows along the coast in rocks or under logs or vegetation.	The population was declining in the area even prior to the earthquake, probably due to predation by introduced mammals.	Unknown.	Caused by predation by introduced mammals and disturbance in their nesting habitat.

Reptiles

Observations:

While there are only three lizard species recorded as being present on the coast, the populations of the two common species are dense as there is a large area of unmodified habitat of the driftwood and vegetation that they require. Marieke Lettink observed approximately 70 Waiharakeke grass skink and Minimc/Marlborough mini gecko on a site visit in July 2018.

The driftwood zone where they live is now many metres away and will not be replenished, but over time it is expected that a new driftwood zone will establish, while the old zone gradually rots away. In the meantime the reptiles need to be able to persist and then colonise the new habitat once it is established.

Prior to the Technical Report Meeting in July 2018, Reptile Specialist Marrieke Lettink visited a number of sites on the coast, especially Ward Beach, Canterbury Gully and Mussel Point. She found high densities of skinks and geckos at these sites, living in the drift wood at the old storm high tide mark. There were two species seen, the Waiharakeke grass skink and mini mac gecko, which were often found living together.

31 lizards found during 45 min of searching conducted by three observers. Lizards were found over a 0.4 km area above the (former) high tide mark, extending north from Mussel Point (this waypoint). No lizards were found immediately south of Mussel Point.

This area experienced significant uplift in the Kaikōura earthquake.

In March 2018, another species, *Woodworthia maculate,* was found at Mussel Point.

During Significant Natural Area monitoring over 2018 and 2019, reptile searches were conducted all along the coast and Waiharakeke grass skink and mini-mac geckos were seen regularly. They are well spread and common along the coast in the debris and driftwood associated with the old high tide mark. There was evidence of vehicle tracks through much of this habitat and the driftwood is showing signs of breaking down now that it is beyond the reach of the storm high tide zone.

Potential Threats:

- Habitat loss
- Predation

Table 4: Reptiles

Species	Description	Conservation Status New Zealand Threat Classification System/International Union for Conservation of Nature and Natural Resources	Population	Habitat	Breeding	Observations	Potential Threats
Waiharakeke grass skink (*Oligosoma* aff.*polychroma* Clade 2) 	The most commonly seen skink in South Marlborough in farmland and coastal sites.	At Risk-Declining.	Mussel Point to the Waima River. Relatively common all along this coastal area wherever the habitat exists. This is a significant population with over 70 seen in a single day of searching along the top of the beach.	Lives under driftwood and in vegetation along the coast, especially along the storm high tide mark where driftwood collects.		Raising of the coastal zone and changing the location of the habitat there. A new storm high tide mark now exists.	Mainly predation by introduced mammals. Loss of habitat.
Mininac gecko (*Woodworthia* "*Marlborough mini*"). 	The most commonly seen gecko in South Marlborough in farmland and coastal sites.	Not threatened.	Relatively common all along this coastal area wherever the habitat exists. This is a significant population.	Lives under driftwood and in vegetation along the coast, especially along the storm high tide mark where driftwood collects.		Raising of the coastal zone and changing the location of the habitat there. A new storm high tide mark now exists.	Mainly predation by introduced mammals. Loss of habitat.

Species	Description	Conservation Status New Zealand Threat Classification System/International Union for Conservation of Nature and Natural Resources	Population	Habitat	Breeding	Observations	Potential Threats
Raukawa gecko (*Hoplodactylus maculatus*) 	Larger and more strking than the Marlborough mini.	Not threatened.	Seldom detected along this coast. Mussel Point. Rare on the mainland but common the Sounds Islands.	Lives under driftwood and in vegetation along the coast, especially along the storm high tide mark where driftwood collects.		Raising of the coastal zone and changing the location of the habitat there. A new storm high tide mark now exists.	Mainly predation by introduced mammals. Loss of habitat.

Invertebrates

Observations:

A number of invertebrates call the coast home, including earwigs, cockroaches, beetles and hoppers. They are food for various other species, especially lizards and birds. The threatened invertebrates are described below.

Ian Millar, a specialist on invertebrates provided further information to Council on Marlborough's coastal sites known to have rare/threatened invertebrates. He has only visited a small number of sites along the Marlborough coast. The following information is provided about invertebrates from the sites he has visited or has information on.

The most thoroughly assessed site has been Te Koko-o-Kupe/Cloudy Bay foreshore, between where the Rarangi Road meets the coast and the Wairau Diversion. An extensive survey at this site found a number of rare moth species, namely: *Kiwaia* "Cloudy Bay" (mat-daisy jumper); *Dichromodes* "Cloudy Bay" (stone moth); *Ericodesma aerodana* (*Pimelea* leafroller moth); and *Notoreas perornata* "Cape Campbell" (*Pimelea* looper moth)

In searching for other sites which might have these species, especially the *Kiwaia*, we checked out several nearby coastal sites: the coast north to Rarangi; coastal sites from Wairau Diversion to Wairau Bar; and the Wairau Boulder Bank.

Subsequently we also checked out some sites with *Raoulia* further south, specifically for *Kiwaia*. Of these, only one small site at Clifford Bay was in Marlborough district. (The others were south of Kekerengū, in Kaikōura district, between Deadman and Boundary Streams.) These searches were totally focussed on *Kiwaia*, which was not present, and no assessments of other species were made.

One further opportunity arose for coastal survey, when I accompanied Peter Gaze to the White Bluffs/Te Parinui o Whiti area south of Wairau Lagoons to look for possible presence of seabirds nesting on the bluffs. I took the opportunity to do UV light trapping at night, immediately south of the bluffs. This resulted in finding a further population of *Dichromodes* "Cloudy Bay". We also found specimens of what was then considered to be a rare ground weta, *Hemiandrus* "Cape Campbell".

A site visited by Brian Patrick during his country-wide survey for katipo, and for which he gave me information on other species, is the area of coast immediately south of Canterbury Gully (which we visited prior to the Council workshop). Here he found what he described at the time as a good population of katipo (he selected it as one of a number of populations around the coast for potential monitoring) as well as a good population of *Notoreas perornata* "Cape Campbell".

Unfortunately I have no information on invertebrates or their habitats for any of the coast between Flaxbourne River and Kekerengū.

Species of interest:

Kiwaia "Cloudy Bay" (mat-daisy jumper)

Known only from the Te Koko-o-Kupe/Cloudy Bay foreshore where it is confined to a 20m wide strip immediately behind the foredune, running 2km north from Wairau Diversion. Occurs in area of semi-bare sand with *Raoulia* mats and other sparse sand plants: apparently associated primarily with the *Raoulia*. Major threats are off-road vehicle use of areas away from the formed tracks, occasional severe droughts and potential fires. Limited surveys have been conducted elsewhere for this species without success.

Conservation status as determined in 2015: Nationally critical.

Dichromodes "Cloudy Bay" (stone moth)

Caterpillars of this species are presumed to feed on lichens on stones in the sands at Te Koko-o-Kupe/Cloudy Bay foreshore, along a strip extending 2km north from Wairau Diversion. The moth occurs at this site in reasonable numbers. It has also been found in reasonable numbers

immediately south of White Bluffs/Te Parinui o Whiti where it may occupy habitat along a short creek bed between the bluffs and shore.

Conservation status as determined in 2015: Nationally endangered.

Ericodesma aerodana (*Pimelea* leafroller: tortricid moth)

Host species are *Pimelea* species of frost flats and coasts. Patchy distribution from Cape Reinga to Kaitorete Spit, with much of its habitat in decline. The North and South Island populations are distinguishable and may be separate species; the South Island form is known only from Te Koko-o-Kupe/Cloudy Bay foreshore and Kaitorete Spit, Canterbury. At Te Koko-o-Kupe/Cloudy Bay, it is limited to the strip immediately behind the foreshore, between Wairau Diversion and the Rarangi Road.

Conservation status as determined in 2015: At risk – Declining.

Notoreas perornata "Cape Campbell" (*Pimelea* looper)

This subspecies was formerly known from three populations, on the Te Koko-o-Kupe/Cloudy Bay foreshore, on the foreshore just south of Canterbury Gully (where it co-occurs with red katipo) and at Gore Bay, North Canterbury. The latter population became extinct when its hostplant population died out.

Conservation status for this subspecies as determined in 2015: Nationally endangered.

Latrodectus katipo (katipo; red katipo)

This species appears to be in decline in many sites around the country. In some instances this is a result of modification of and general human impacts on dunelands. Patrick (2002) found a good population in dunes just south of Canterbury Gully.

Conservation status as determined in 2012: At risk – Declining.

A further species from the Marlborough coast which initally had a threat ranking is *Hemiandrus* "Cape Campbell" (a species of ground weta) which was known from Marfells Beach and Cape Campbell and subsequently found at White Bluffs/Te Parinui o Whiti and Seaview. Steve Trewick (pers. com., 2008) and students at Massey University had the opportunity to get DNA sequence data from Marfells and Seaview specimens and preliminary results indicated that the two populations were conspecific but with surprisingly high variation between the two, which Steve described as "not negligible".

Conservation status as determined in 2016: Not threatened.

Potential Threats:

- Habitat loss
- Predation

Table 5: Invertebrates

Species	Description	Conservation Status New Zealand Threat Classification System	Population	Habitat	Breeding	Observations	Potential Threats
Red katipo (*Latrodectus katipo)* Photo, Simon Walls.	The only poisonous spider native to New Zealand. Found only on the coast under driftwood and in vegetation.	Declining nationwide.	Mainly restricted to areas of undeveloped dunes. Cape Campbell area described as one of the key sites nationally in 2002.	Driftwood and vegetation above the high tide mark.	Nests above the high tide mark under driftwood and vegetation.	Their habitat has moved and will be re-stablishing over time.	Loss of habitat. Competition with introduced spider.
Cape Campbell Pimelea moth	Moth endemic to the area which lives its lifecycle on *Pimelea prostrata* mats.	Nationally endangered.	Cape Campbell, The Needles and Mirza Stream mouth.	Lives on the *Pimelea prostrata* mat plants which are on coastal gravels.	Endemic to Cape Campbell coastal area.	The largest population of Pimelia is at The Needles. This site is badly tracked by vehicle on the dunes and gravels since the earthquake and the plants badly damaged.	Habitat loss due to cultivation. Pimelia mat plants and pimelea moths being damaged by vehicles especially at The Needles.

Figure 10: Pinotoro (*Pimilea prostrata*) must expand down to the new storm beach area for invertebrates that live there to survive

Figure 11: Rock weathering Dec 2017

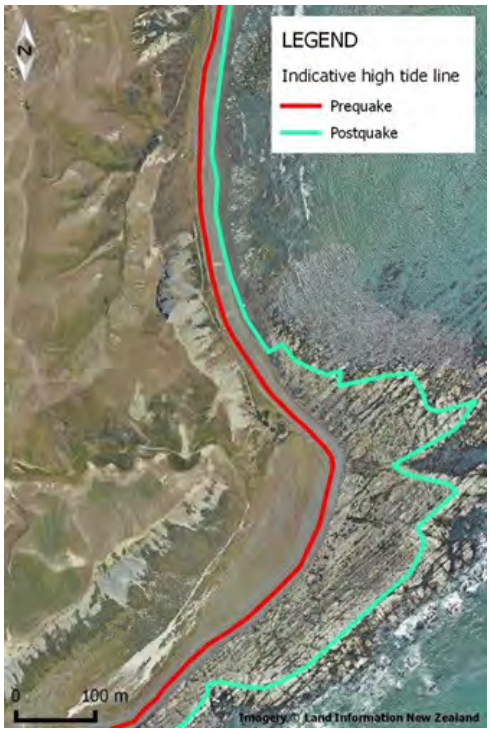


Figure 12: Pāua remain but are vulnerable (left)

Figure 13: Long Point pre and post-quake high tide

5.3.2. Marine Ecosystems

The existing reef ecosystems were badly damaged by the earthquake. Large areas are now above water for most or all of the time and support no marine life. The marine ecosystems present in the focus area are shown on the maps in Appendix 8.

Research findings:
The University of Canterbury Marine Ecology Research Group has monitored the coast from Cape Campbell to Oaro (south of the focus area) since the mid-1990s. High diversity reefs and the convergence of northern and southern species made the Cape Campbell/Te Karaka area especially interesting. Monitoring intensity increased after the November 2016 quake, with over 3000 hours of study clocked up in 18 months. Researchers noted considerable damage to structures and marine biodiversity, with recovery uncertain. Monitoring of ecosystem recovery by the University of Canterbury is ongoing.

Observations:
- Uplift thrust some reefs and algal beds out of the water.
- Structural change of some areas still covered by tide.
- Insufficient new reef emerged to replace what was lost.
- Up to 200m shift, between old and new high tide marks.
- Temperature increased significantly as shallow rocky reefs became more exposed, surpassing thermal tolerance for many species.
- Disappearance of almost all seaweed except in very low tidal zone, with little recovery up to 2 years after the quake.
- Seaweed disappearance triggered massive biodiversity loss – approximately 40% of coastal fish biomass is directly related to seaweeds through food web interactions.
- Rockpool species, including sucker fish, anemones and starfish, disappeared on many reefs as tidepools in the mid-tidal zone become high and dry.
- On the south side of the Cape newly exposed mudstone is eroding as it dries, creating sediment that smothers habitats.
- Many of the 19 ship wrecks along the coast between Cape Campbell and the Waima/Ure are now exposed by quake uplift.

Potential Threats:
- Walkers. Appear to have minimal impact, although the University of Canterbury Marine Research Group has discovered trampling of newly exposed reef platforms is causing damage, especially of eroding sandstone rocks. A track being worn through a reef by someone checking their cray-pot will take two to nine years to recover.
- Vehicles driving on the reef ecosystem is causing further stress.

Species	Observations	Location
Paua.	Adult pāua have survived in many areas, despite high mortalities in some places. Larger pāua disappeared between surveys, suggesting loss or movement. Recruitment is patchy as juvenile pāua habitat-shallow water, no more than about 1m below low tide – is lost in places due to uplift or smothering by sediment. Shucked pāua shells indicate illegal take in some areas. Pāua recruitment areas are being compromised by people pressure, as well as natural erosion. Because young pāua recruit in very shallow water (no more than 3-4m below low tide) they are vulnerable to illegal poaching.	Rocky reef areas all along the coast, especially Cape Campbell to Canterbury Gully, Long Point, Ward Beach/Chancet Rocks.

"With increased temperatures due to little water coverage at high tide, more sediments that prevent attachment or smother organisms, and more wave exposure on vertical surfaces that remain after horizontal reefs were uplifted, the conditions required for many species have changed." David Schiel, Professor of Marine Science, University of Canterbury.

Figure 14: Exposed limestone/mudstone platforms at Cape Campbell post-quake, with close to total loss of seaweeds

5.3.2.1. Marine Mammals

Observations:

There are growing breeding rookeries at Cape Campbell and more recently, The Needles, especially since the Kaikōura Earthquake. The location of marine mammals is shown on a map in Appendix 9.

Potential Threats:

- Recreational users
- Vehicles

Species	Location	Observations	Potential Threats
Seals.	Cape Campbell and The Needles.	Seals are being disturbed, including developing breeding colonies at The Needles and Cape Campbell. DOC predicts that negative impacts for marine mammals from increased vehicle access will become exponentially greater as it becomes more known that tracts of the coast are ideal vehicle tracks.	Disturbance by people and vehicles.
Elephant seals	Beach south of Cape Campbell	Uncommon breeding visitor, usually sub-antarctic.	

5.4. Cultural

Council staff met with a Ngāti Kuri representative on 5 August 2019. The East Coast is culturally significant to them with pa sites throughout and mahinga kai (food gathering) of significance from the sea and rivers. Ideally their preference is for the protection of the entire coastline from vehicle access. Ngāti Kuri will be

actively involved in our processes and intends to allow Council access to their database that can be used to inform our investigation.

DOC has GIS layers which show archaeological and cultural sites.

5.5. Recreational and Commercial Use

Observations:
The same recreational and commercial activities that are described in the before section and as mapped in Appendix 3 are still occurring. However, the recreational opportunities, in particular, along Marlborough's East Coast have changed post-quake due to uplift shifting the high tide line further down the beach. This has made more of the beach accessible more of the time. There is also a new surf break at Ward Beach, created by reef raised in the earthquake.

"The uplift caused by the earthquake exacerbated the issues by making previously difficult areas more available. Yet the very environmental treasures that we value along the beach are being damaged, altered and destroyed." Forest and Bird regional manager, Debs Martin, speaking to the Marlborough District Council Environment Committee, March 2018.

DOC has recorded a 3 times increase in use of the campground at Marfells Beach. Land owners have observed and reported anecdotally, an increased number of visitors to the area and more vehicle traffic on the coastal margin. The ECPG has documented some beach users' observations at Marfells Beach for Easter 2018 and 2019 and at Mussel Point on a weekend in October 2018 [CM Record numbers 19101002 (Mussel Point), 19100997 (Marfells Beach)]

The observations at Mussel Point showed of the 48 visitors on the Saturday between 7.00am and 3.00 pm, 34 of them were using 20 quad bikes. There were three 4wd vehicles. The results recorded the purpose being mostly for fishing followed by leisure activities (not defined). On the Sunday between 7.00 am and 7.00 pm there were 124 visitors. There were 52 users on 28 quad bikes, with five 4WD and 7 motorbikes. On this particular day 78 of the visitors were recorded as visiting the area for leisure activities followed by 40 using the area for fishing. Three horses and 1 dog were recorded. The observations of the recorder on the Sunday noted:

- Vehicles driving all over the beach, some quads and 4WDs going up into upper pea gravel terraces.
- Other vehicles going just above the water.
- Vehicles drive within five metre strip at narrow point between the rocks near Mussel Point, and over 70 metre wide strip where beach is wider.
- Walkers tend to be nearer to the water on firmer sand.

At Marfells Beach on the Thursday before Easter in 2018, 22 quads (25 people) were observed driving out to the Cape between 9.40 am and 2.37 pm. There were 37 walkers. On Good Friday in 2019, only six quads (seven people) were observed heading out to the Cape with 28 walkers observed.

Quake uplift means it's now possible to walk or drive from Marfells Beach to Cape Campbell, then around the Cape and south to as far as Chancet Rocks, at virtually any tide as shown on the maps in Appendix 2. This is a journey of approximately 30km in each direction. What was previously only a low-tide route, is now accessible at most times, by 4WD vehicles, 4-wheeler and trail-bikes as well as on foot.

Now off-road vehicles can easily reach the coast from SH1 at Flemings Road, Cable Station Road (across private land), Marfells Beach, Ward Beach, the Waima/Ure River mouth and – south of the study area – Wharanui Beach. It's possible to drive for many kilometres in either direction, prevented only by headlands at Chancet Rocks and The Needles. Occasional soft sand/pea gravel and flooded rivers can also present challenges to driving, and vehicles do get stuck. As the awareness increases about the changes to the beach, locals are seeing more people visiting on foot, in 4WD vehicles, on 4-wheeler motor-bikes and on trailbikes. Some of these users are often driving at speed that may put the public at risk.

The wheel marks left by all vehicles on the dunes and wider coastal environment are long lasting and have an impact on the visual look of this “Outstanding Coastal Natural Character” landscape.

Following the Technical Workshop, Council staff have consulted with James Bentley on whether the area of Outstanding Natural Landscape (ONL) identified in the Proposed Marlborough Environment Plan (PMEP) has changed or been impacted by the 2016 Kaikōura earthquake. He was also asked to comment on whether the multiple vehicle tracks that are now present on the beach from increased vehicle traffic between Marfells Beach and 18km south of Cape Campbell has any impact on the ONL. He comments; “essentially the biophysical change occurred due to a greater level of visibility of the intertidal areas. Nothing was specifically destroyed or added during that process that wasn’t already captured in some way in the values. The main values are contained within The Limestone Coast ONL and the mapping extends sufficiently into the sea that all of these are already captured. Reference is made to the ongoing geological and tectonic forces that have moulded and sculpted the landform, and I am happy that this is still relevant.” He also agrees that vehicle tracks will affect the landscape values, but not to a degree that it will not make the area an ONL. The key values that underpin this area are listed below and mainly concern the areas broader geomorphological and ecological values. The usage of the beach by vehicles will certainly affect the local legibility and visual coherence of the beach, and potentially its local ecology, but the ONL encompasses quite a broad area that cumulatively contains a variety of features and values that when read as one, meet the ONL threshold.

22. The Limestone Coastline	
Biophysical Values	- Geomorphology of limestone coastline includes several coastal geopreservation sites: Needles Point Cretaceous-Tertiary boundary, Flaxbourne River folds and thrusts, and the Chancet Rocks. - Broad and deeply incised mudstone shore platforms and offshore reefs characterise the marine environment around Cape Campbell. - Colonies of New Zealand fur seals at Chancet Rocks and the Needles. - Coastal platforms and ecological values of importance, with Marlborough endemic flora common, rocky areas (including the Marlborough rock daisy) and gullies. - All of these features are interlinked by beaches, cliffs and back dunes and hill country, which share the same geology and erosional and tectonic forces, culminating in an extremely impressive and legible coastline that clearly expresses its formative processes.
Perceptual Values	- Unencumbered, predominantly pastoral land retains a high level of visual coherence. - Highly expressive coastline from the slender Cape Campbell to Waima/Ure River. - Complex geology creates spectacular landforms and features that are particularly scenic along the coastline.
Associative Values	- A number of Māori archaeological sites are associated with this area, including two ancient pa sites on the coast, as well as a number of ovens and middens. - Possible European associations relating to the limeworks at Chancet. - High recreational values, particularly at Marfells Beach and Ward Beach.
Overview	Based on the above values, The Limestone Coastline has been identified as an ONL due to the exceptional biophysical and associative landscape values and very high sensory landscape values. The Limestone Coastline provides the greatest visual drama in the south Marlborough landscape. The spectacular rocky outcrops of the Needles and Chancet Rocks along the Limestone Coastline south of Cape Campbell are extremely memorable and display very high levels of naturalness. The State Highway 1 coastal road from the Waima Bridge to the southern point of the District contains high scenic values. The coastline of this ONL is largely unmodified and very exposed. The area has remote values and access is limited to a few locations, including Ward Beach and a small number of points south of the Waima River. Walks along the sandy shoreline to the impressive limestone outcrops of the Needles and Chancet Rocks are backed by steep terrain where views towards the open ocean are gained. Views from Cape Campbell lighthouse are spectacular, where panoramic vistas of the sweeping curve of Clifford Bay and the southern shores of the North Island are evident. Other than farm-related activity on the land, this coastline is unmodified, with no aquaculture or jetties/ wharves. The area, once visited, is extremely memorable. Prominent reef areas in the north (including Cape Campbell), give way to extensive sand/gravel shores in the south and large offshore *Macrocystis* (kelp) beds are also present off this coastline. The coastal cliffs and escarpments have small low indigenous forest remnants and unusual, highly distinctive herbfields with nationally threatened species. The dunes and coastal flats also contain nationally threatened species. The Canterbury Gully dunefield, located just south of Cape Campbell, contains nationally threatened ecosystem types and plant species. The coastal scarps and flats have nationally significant ecosystems, including dunes and salt turfs, and good sequences of native coastal vegetation. Several areas are set aside for conservation of natural values through QEII National Trust covenants. Modifications include: pastoral land, occasional fences, farm tracks, a gravel road leading to the lighthouse, a lighthouse and collection of small buildings (including a small overhead powerline), an airstrip, a small quarry, and the Ward beach buildings and road end. This area also includes the eastern extent of Marfells Beach Road.

Steep sided and high dune faces on the south side of The Needles and Mirza Stream have tyre marks on them from motorbikes and ATVs. This threatens to undermine the stability and plant life of the dunes.

Vehicle track marks are continuous in places, extending from reefs, coastal platforms and sand exposed at low tide, right into the dunes.

Potential Threats:

- Public Safety
- Vehicles

Figure 15: Trucks are driving on multiple habitats, from coastal platforms to dunes.

Figure 16: A well-laden 4WD drives along Marfells Beach, disappearing out of view as it rounds Mussel Point

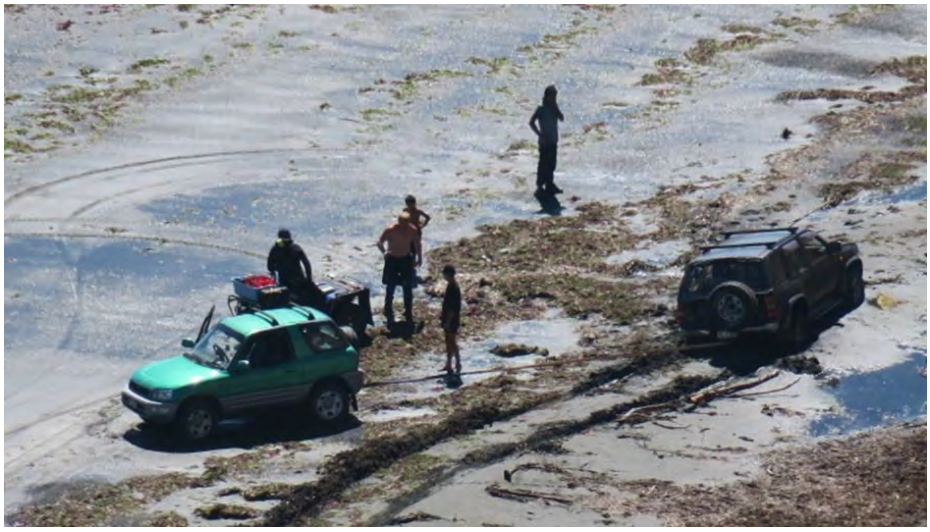


Figure 17: Vehicle stuck in soft sand at Marfells Beach

Figure 18: Well-worn vehicle route around Mussel Point

6. Conclusion

The coastal environment along Marlborough's East Coast has a number of significant landscape and ecological values, is recognised by the public as a recreational place of interest and is a place where commercial activities such as fishing occur along the coastal margin.

The 2016 Kaikōura earthquake has made more of the beach on the East Coast more accessible for more of the time which has resulted in an increased use of the coast in a way which is impacting on its naturalness and remoteness.

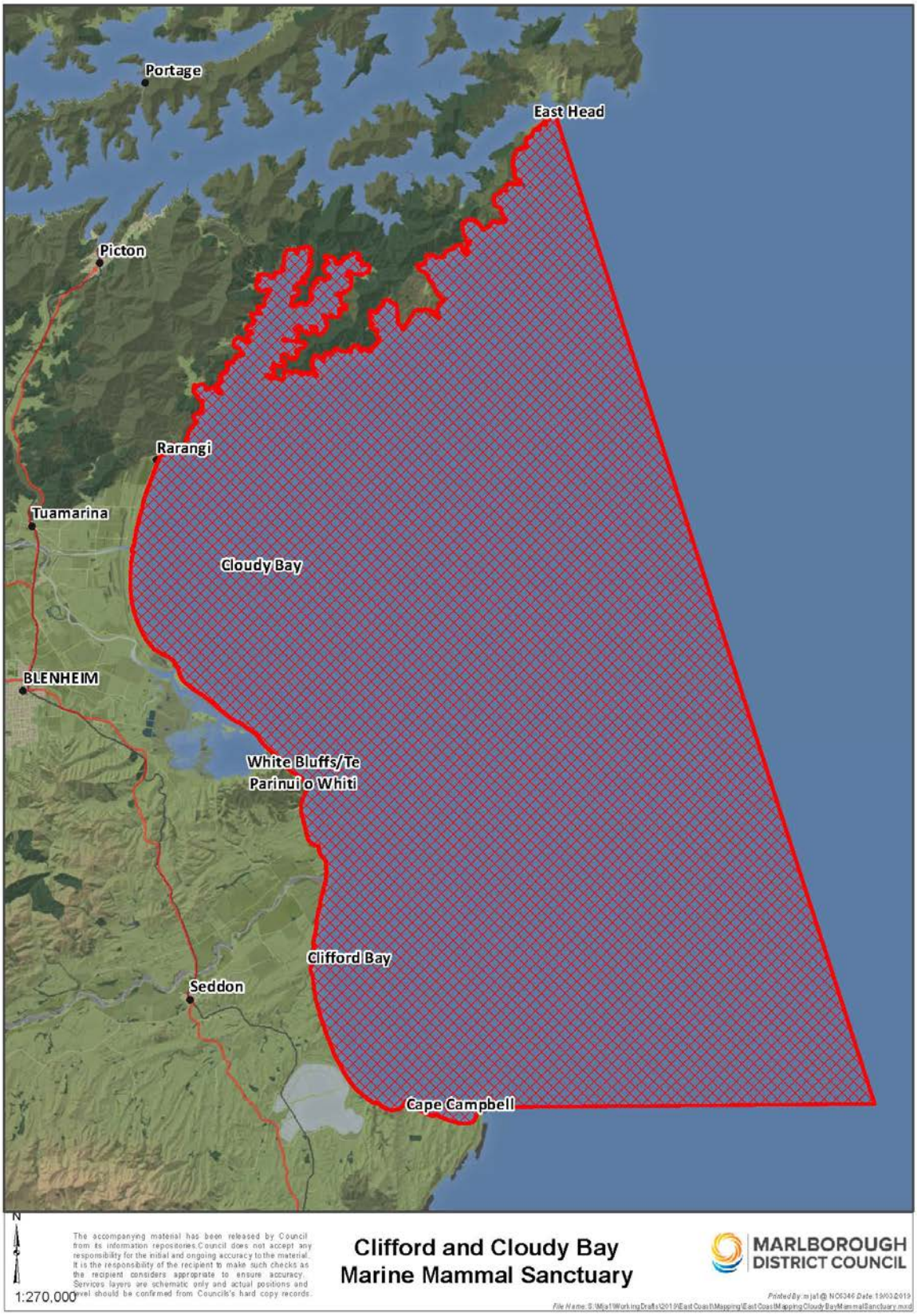
Vehicles are:

- Driving over multiple ecological environments with tracks all over the beach and above it.
- Driving on what was the old storm beach, now high and dry, preventing colonisation by plants and thecreation of new habitats.
- Driving at speed.
- Using the 8km stretch of beach from the Needles to Wharanui as a "race-track".
- Crushing Raoulia (vegetable sheep), pimelea mats and other special plants which grow on a gravelpavement at the Needles.
- Disturbing banded dotterel and variable oyster catcher nesting habitat.
- Disturbing lizard and invertebrate habitat.
- Likely to injure or kill birds, lizards and invertebrates.
- Providing tracks for predators, especially those left after driving through vegetation.

The continued use of the coastline by vehicle traffic is putting some of the existing habitats at risk as well as threatening the process of rebuilding. Natural recovery of marine reef habitats is being hampered by vehicles using the reef platforms.

It is intended that this report will be used to assist the Council to reach a decision on an informed basis about whether to restrict access to parts of the focus area and to what extent.

Appendix 1: Clifford and Cloudy Bay Mammal Sanctuary



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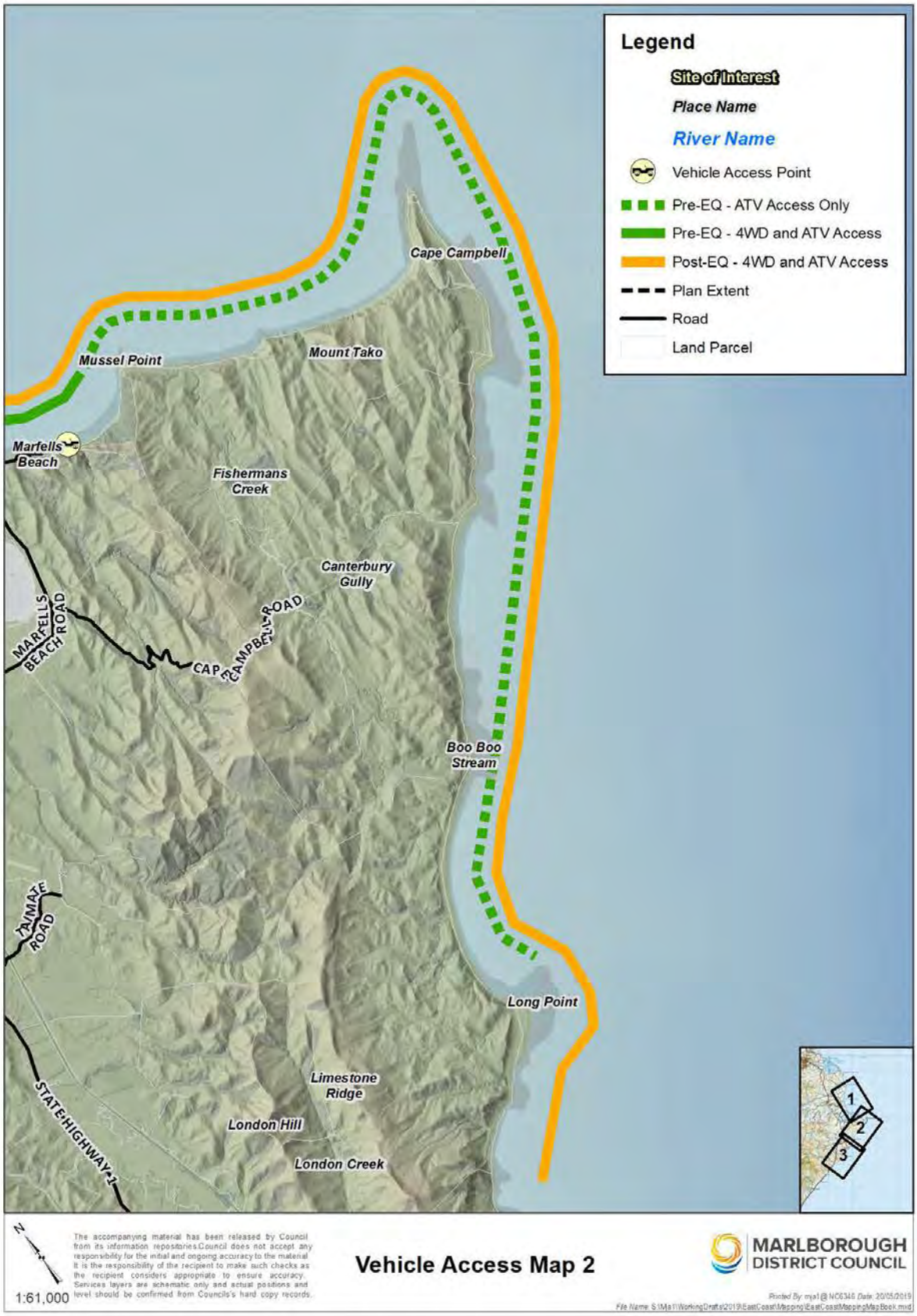
Vehicle Access Map 1

Updated November 2019

MARLBOROUGH DISTRICT COUNCIL

Printed By: mja1@ NC7915 *Date:* 14/11/2019
File Name: S:\Mja1\WorkingDrafts\2019\EastCoast\Mapping\EastCoastMappingMapBook.mxd


Legend
Site of Interest
Place Name
River Name
Vehicle Access Point
Pre-EQ - ATV Access Only
Pre-EQ - 4WD and ATV Access
Post-EQ - 4WD and ATV Access
Plan Extent
Road
Land Parcel
Cape Campbell
Mussel Point
Mount Tako
Marfells Beach
Fishermans Creek
Canterbury Gully
MARFELLS BEACH ROAD
CAPE CAMPBELL ROAD
Boo Boo Stream
TAIMATE ROAD
Long Point
Limestone Ridge
STATE HIGHWAY 1
London Hill
London Creek
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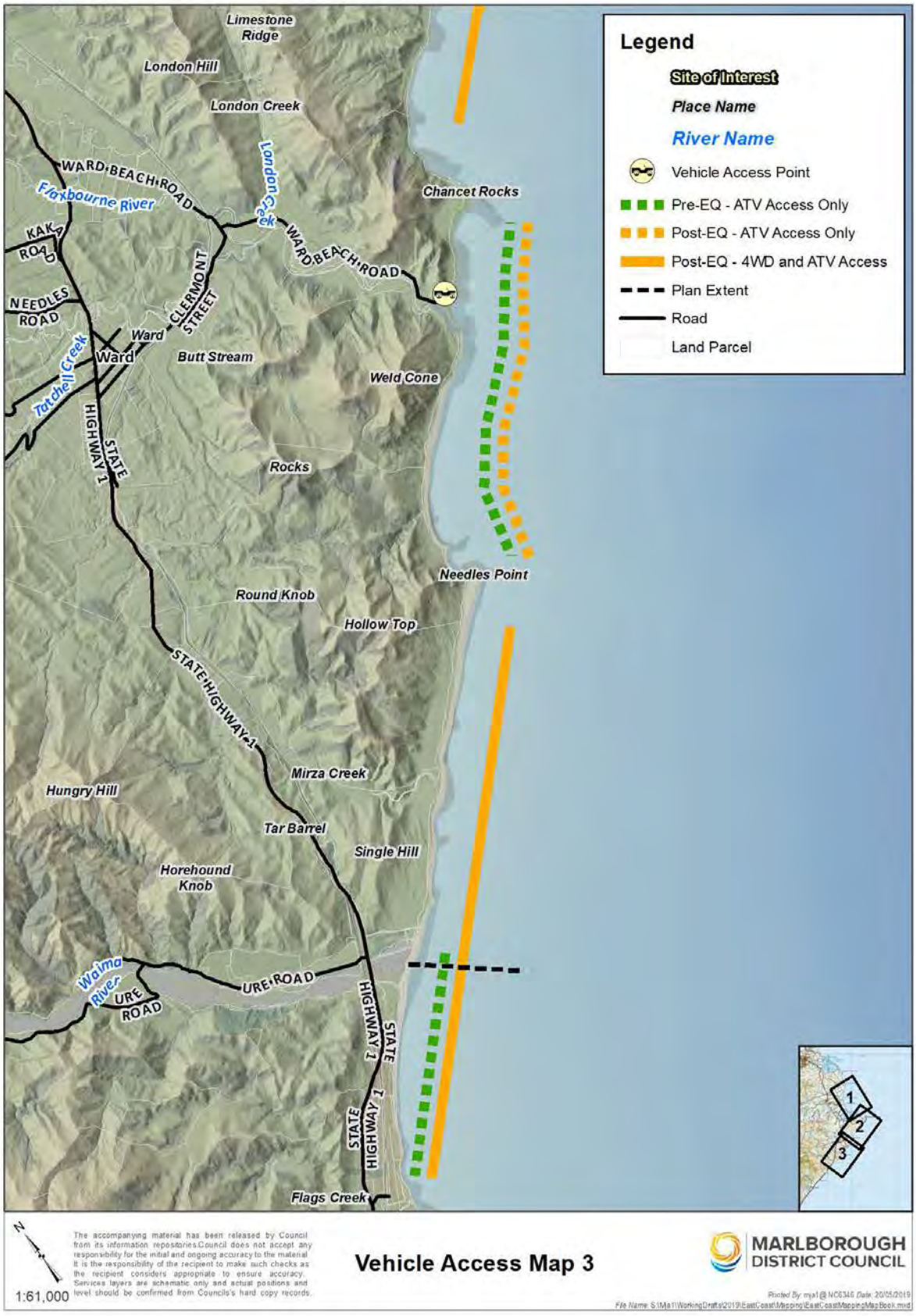
Vehicle Access Map 2
MARLBOROUGH DISTRICT COUNCIL


Legend
Site of Interest
Place Name
River Name
Vehicle Access Point
Pre-EQ - ATV Access Only
Post-EQ - ATV Access Only
Post-EQ - 4WD and ATV Access
Plan Extent
Road
Land Parcel
Limestone Ridge
London Hill
London Creek
WARD BEACH ROAD
Flaxbourne River
London Creek
Chancet Rocks
KAKA ROAD
NEEDLES ROAD
CLERMONT STREET
Ward
Ward
Butt Stream
Weld Cone
Tatchell Creek
HIGHWAY 1 STATE
Rocks
Needles Point
Round Knob
Hollow Top
STATE HIGHWAY 1
Mirza Creek
Hungry Hill
Tar Barrel
Single Hill
Horehound Knob
Waima River
URE ROAD
URE ROAD
HIGHWAY 1 STATE
HIGHWAY 1 STATE
Flags Creek
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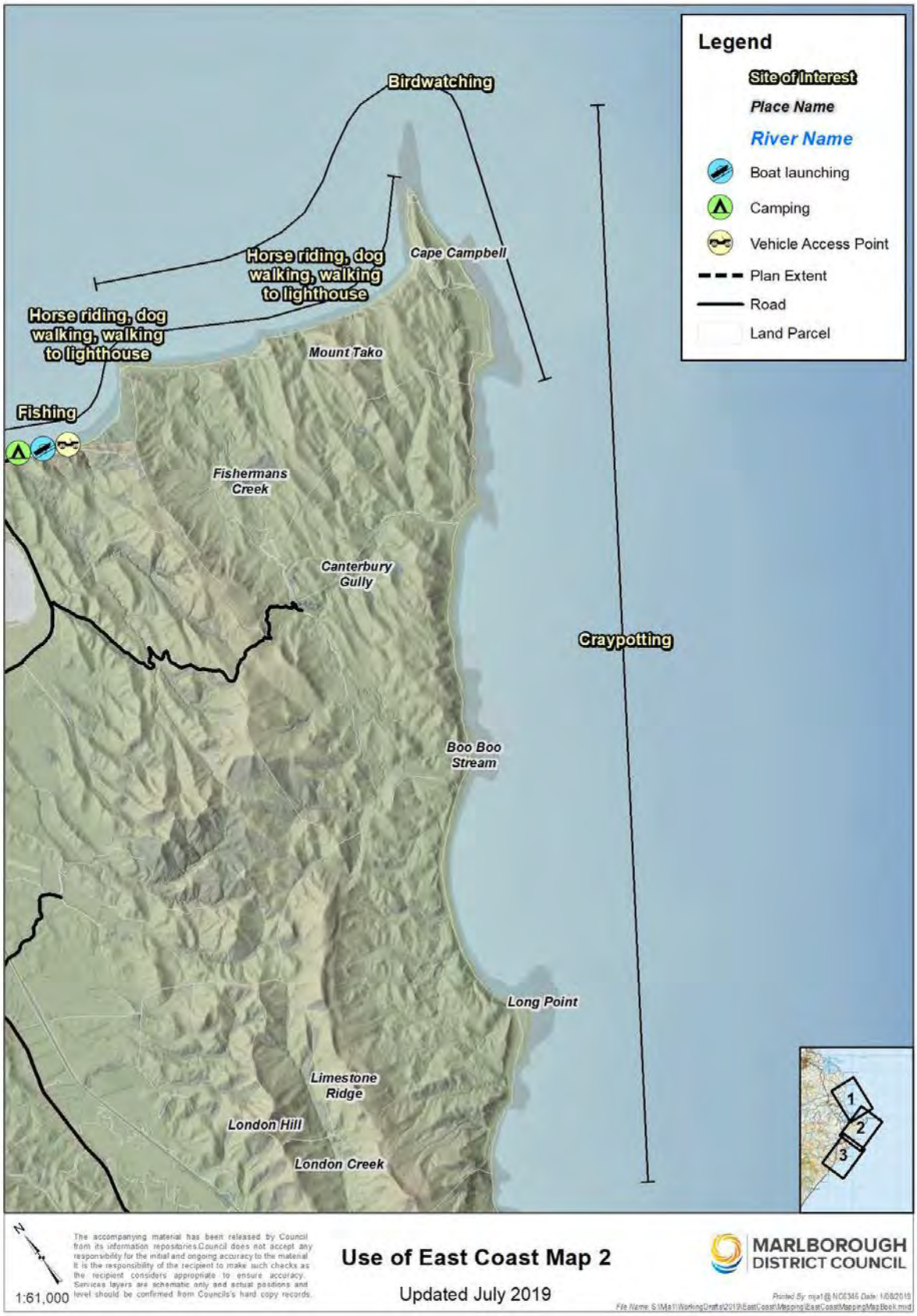
Vehicle Access Map 3
MARLBOROUGH DISTRICT COUNCIL

Appendix 3: Use of the East Coast Maps


Legend
Site of Interest
Place Name
River Name
Boat launching
Camping
Vehicle Access Point
Plan Extent
Road
Land Parcel
Birdwatching
Horse riding, dog walking, walking to lighthouse
Cape Campbell
Horse riding, dog walking, walking to lighthouse
Mount Tako
Fishing
Fishermans Creek
Canterbury Gully
Craypotting
Boo Boo Stream
Long Point
Limestone Ridge
London Hill
London Creek
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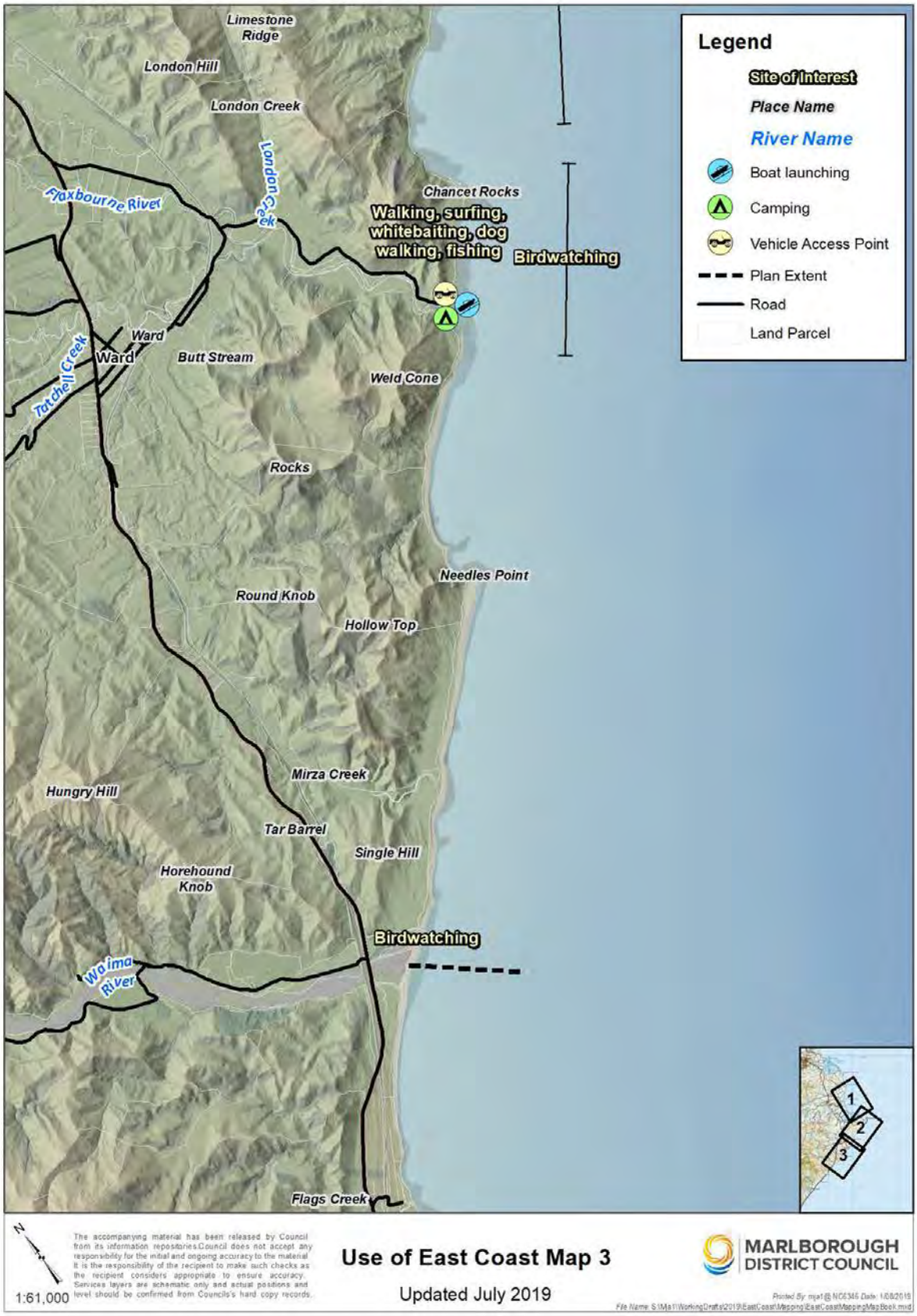
Use of East Coast Map 2
Updated July 2019
MARLBOROUGH DISTRICT COUNCIL


Limestone Ridge
London Hill
London Creek
London Creek
Flaxbourne River
Chancet Rocks
Walking, surfing, whitebaiting, dog walking, fishing
Birdwatching
Ward
Ward
Tatchell Creek
Butt Stream
Weld Cone
Rocks
Needles Point
Round Knob
Hollow Top
Mirza Creek
Hungry Hill
Tar Barrel
Single Hill
Horehound Knob
Birdwatching
Wairau River
Flags Creek
Legend
Site of Interest
Place Name
River Name
Boat launching
Camping
Vehicle Access Point
Plan Extent
Road
Land Parcel
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Use of East Coast Map 3
Updated July 2019
MARLBOROUGH DISTRICT COUNCIL

Appendix 4: Information Brochure

To help protect of our coastal environment for future generations

We ask that:

- Motor vehicles please stay on the wet sand (below high tide)
- South of the lighthouse, be careful where you go. Avoid all vegetation/dune-lands and tidal rock pools.
- Give the ecology, birdlife and animals space and time to recover.
- Whatever you take with you, bring it back! Rubbish is becoming an increasing problem.
- Please remove craypots from the beach when they are not being used.
- Leave only your footprints.

Be informed
Help the recovery

The East Coast Protection Group (ECPG) has been formed by traditional users of the area and local residents. A strategy has been developed to protect this unique area and to ensure that human activity treads lightly on the landscape.

VISION STATEMENT

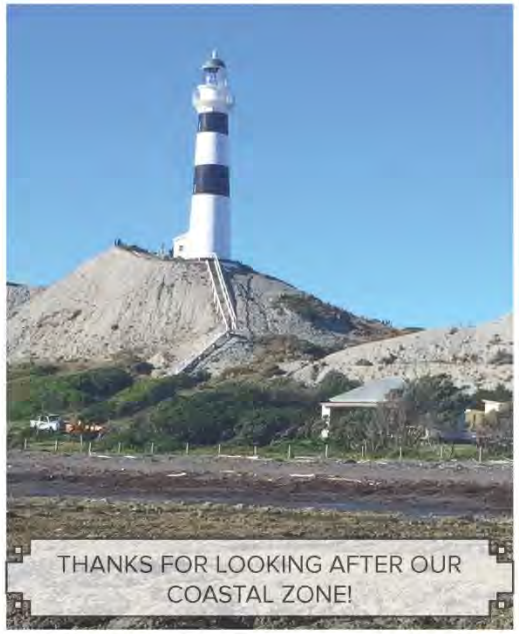
- To create local leadership, and educate coastal users.
- To achieve protection of our coastal environment for future generations,
- To understand the distinctive biological diversity and cultural heritage of this outstanding natural landscape and its values.

For more information on the East Coast Protection Group please email isolation-merino@xtra.co.nz

East Coast Marlborough

Beach & Coastal users

We need your help



Marlborough's East Coast is renowned for its isolation, rugged beauty and plant and animal life that call the area home.

Since the Earthquake of 14 November 2016 and the associated coastal uplift, much has changed.

Cape Campbell before the earthquakes

Cape Campbell after the earthquakes.

We understand that you will want to visit the area and discover what has changed but ask that you respectfully share the environment with nature and other beach users.

~~~~~~~~~~

Did you know the East Coast is a hotspot of New Zealand's Biodiversity?

Coastal currents from the north and south converge to bring a unique assemblage of species to these shores. Fur seals use beaches and headlands for pupping and basking. Many sea birds have nesting colonies here and the coast is a known migration route. All of these are under threat of being damaged by increased usage of the coastal strip.

Banded Dotterel nesting on the beach

Canterbury University scientists have been monitoring this area for over 20 years. After recent events they are visiting the area more often to monitor the affected coast and the recovery process. Prof David Schiel and his Marine Ecology team have informed the community that the health of the near-shore zone has undergone massive disruption and needs time to restore itself. It is obvious that rocky habitats have been propelled upwards, but less obvious is the extensive loss of 'biological habitat', including the seaweeds and small organisms that sustain and feed through the coastal food web, such as paua, fish and birds.

Uplifted beach platform - Cape Campbell
~~~~~~~~~~

Appendix 5: User Guide for 4WD Users

Marfells Beach Quad Bike Fishing Group

Voluntary Code of Practice

Since establishing our CoP, we have, along with others observed those that have signed up to the CoP are abiding by the CoP to a good level of compliance.

The other observations made is that others that are not associated to our group are now becoming educated and following our track which keeps them from the upper beach area.

The groups position now is that we are encouraged to educate more people to follow a good practice in utilising the beach, we offer the following points to further our responsible practice.

1. All vehicles must travel below the high tide line.
2. NZTA speed limit on beaches is set at 50km, voluntary limit rounding Cape Campbell set at 25kph from 1km north of the lighthouse to 1km on the south side of the lighthouse.
3. Only travel on the beach in day light hours around the period of low tide other than for the purpose of launching a boat.
4. All vehicles must give right of way and allow a maximum separation from all other beach users.
5. No vehicles are to access private land without the permission of the land owners.
6. Vehicles on rock shelves must avoid rock pools and marine growth.
7. Passing birds and seals should be done quietly and carefully with maximum separation.
8. All pots will be removed from the beach after use, these can no longer be stored up in the dunes.
9. All rubbish to be removed and disposed of responsibly.
10. We do not support camping outside of the designated camping area.

A written CoP hand-out along with local history and education on the importance of good vehicle behaviour since the earthquake event.

Over a period of time we have been given a lot of information about the beach, this has been provided by scientists, experts and anecdotal. When assessing this information as to the quad

bike use along the beach we consider our impact as being minor based on our CoP. Every tide will wash away our use.

References Noted:

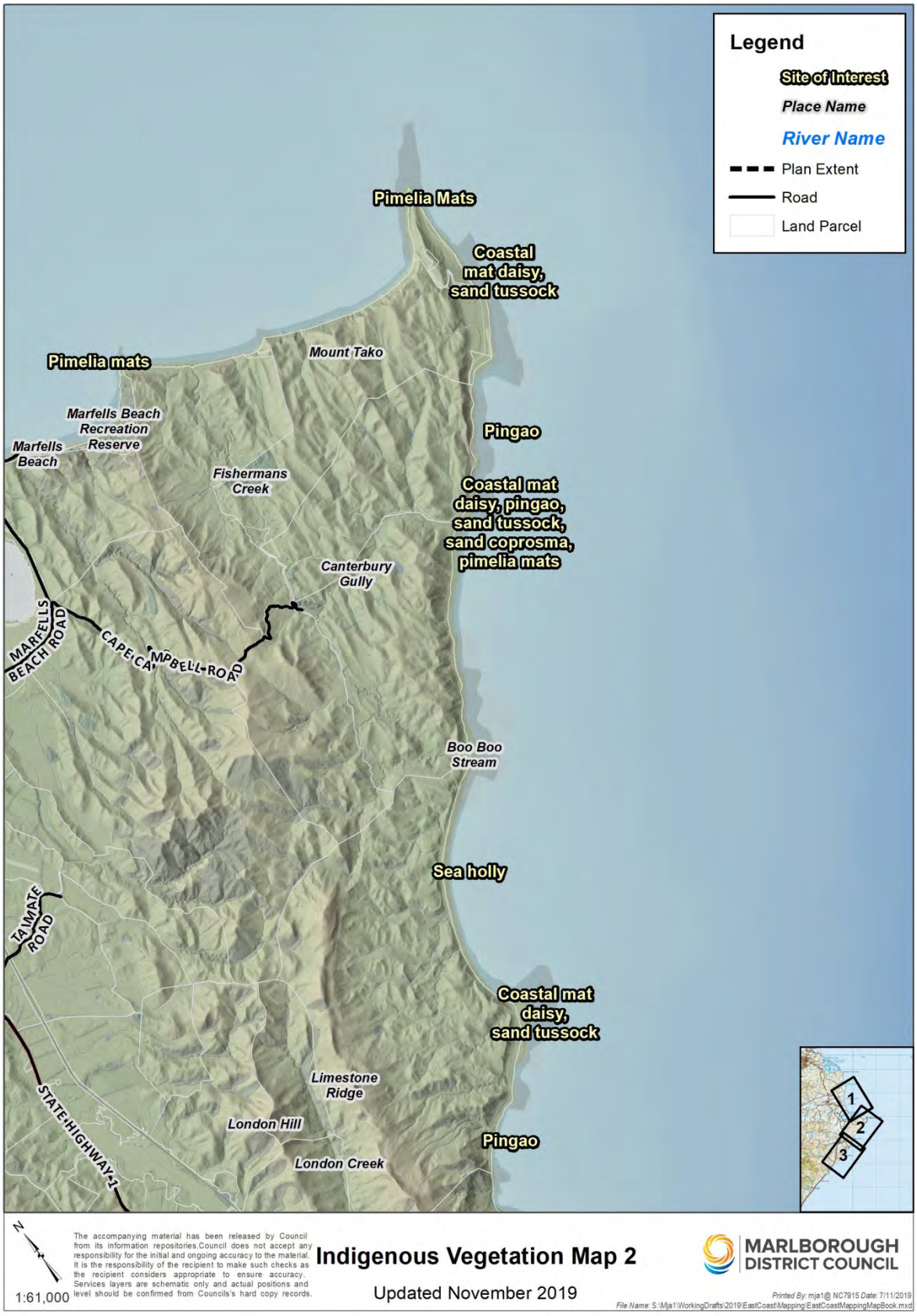
1. David Shields; "that a storm will do more damage to a beach than quad bikes will ever do"
2. W Parson; Bird numbers are the same as what was observed 50 years ago.
3. NZTA speed limits
4. Sally Neil; *quote points in letter*
5. Utilising below high tide mark does not destroy ecological values. (*quote someone*)
6. Quad bike foot print; a study of a TRX 500 weighs a total of 293kgs, calculations show that a quad bike has less ground pressure than an average 88.67kg male has. Average male has 23 square cm foot print, comparison is a male produces 2.463kgs per square cm, verse a quad bike producing 0.706kgs per square cm.

As the local quad bike fishing group, we are seeing our CoP being abided to, we would like ECPG to acknowledge that the CoP that we have introduced is now adopted by the ECPG as an acceptable CoP which will be further developed as the management strategy for along the Eastcoast is developed. Having this CoP endorsed by ECPG will give our group recognition in what they have achieved which in turn will give better compliance all round and followed by others.

With the adoption of the CoP we can put our concerns aside and participate in an open process with out the thoughts that we are being targeted as the bad guys that are not wanted.

The CoP we have provided is for the local recreational fishermen to access and utilise the fishery, this CoP is not for 4x4 vehicles nor two-wheel motor bikes or other forms of transport i.e. horses. We understand our access along the beach is to fish and provide sustenance, 4x4 and two-wheel bikes are seen utilising the beach as either a recreational activity or sightseeing. We are willing to share or CoP with others so they to can set their own best practice.

Appendix 6: Indigenous Vegetation


Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
Pimelia Mats
Coastal mat daisy, sand tussock
Pimelia mats
Mount Tako
Marfells Beach Recreation Reserve
Marfells Beach
Pingao
Fishermans Creek
Coastal mat daisy, pingao, sand tussock, sand coprosma, pimelia mats
Canterbury Gully
MARFELLS BEACH ROAD
CAPE CAMPBELL ROAD
Boo Boo Stream
Sea holly
TAIMATE ROAD
Coastal mat daisy, sand tussock
Limestone Ridge
STATE HIGHWAY 1
London Hill
Pingao
London Creek
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1:61,000
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Indigenous Vegetation Map 2
Updated November 2019
MARLBOROUGH DISTRICT COUNCIL
Printed By: mja1@ NC7915 Date: 7/11/2019
File Name: S:\Mja1\WorkingDrafts\2019\EastCoast\Mapping\EastCoastMappingMapBook.mxd

Limestone Ridge
London Hill
Pingao
London Creek
WARD BEACH ROAD
Flaxbourne River
Chancet Rocks
Pimelia mats
KAKA ROAD
WARD BEACH ROAD
WARD BEACH ROAD
NEEDLES ROAD
Ward Beach
Ward
Ward
Butt Stream
Weld Cone
Tatchell Creek
HIGHWAY 1
STATE
Rocks
Coastal mat daisy, sand coprosma, sand tussock
Needles Point
Round Knob
Pingao, pimelia mats
Hollow Top
STATE HIGHWAY 1
Mirza Creek
Coastal mat daisy
Hungry Hill
Pimelia mats
Pingao
Tar Barrel
Single Hill
Horehound Knob
Waima River
URE ROAD
HIGHWAY 1
STATE
STATE HIGHWAY 1
Flags Creek
Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
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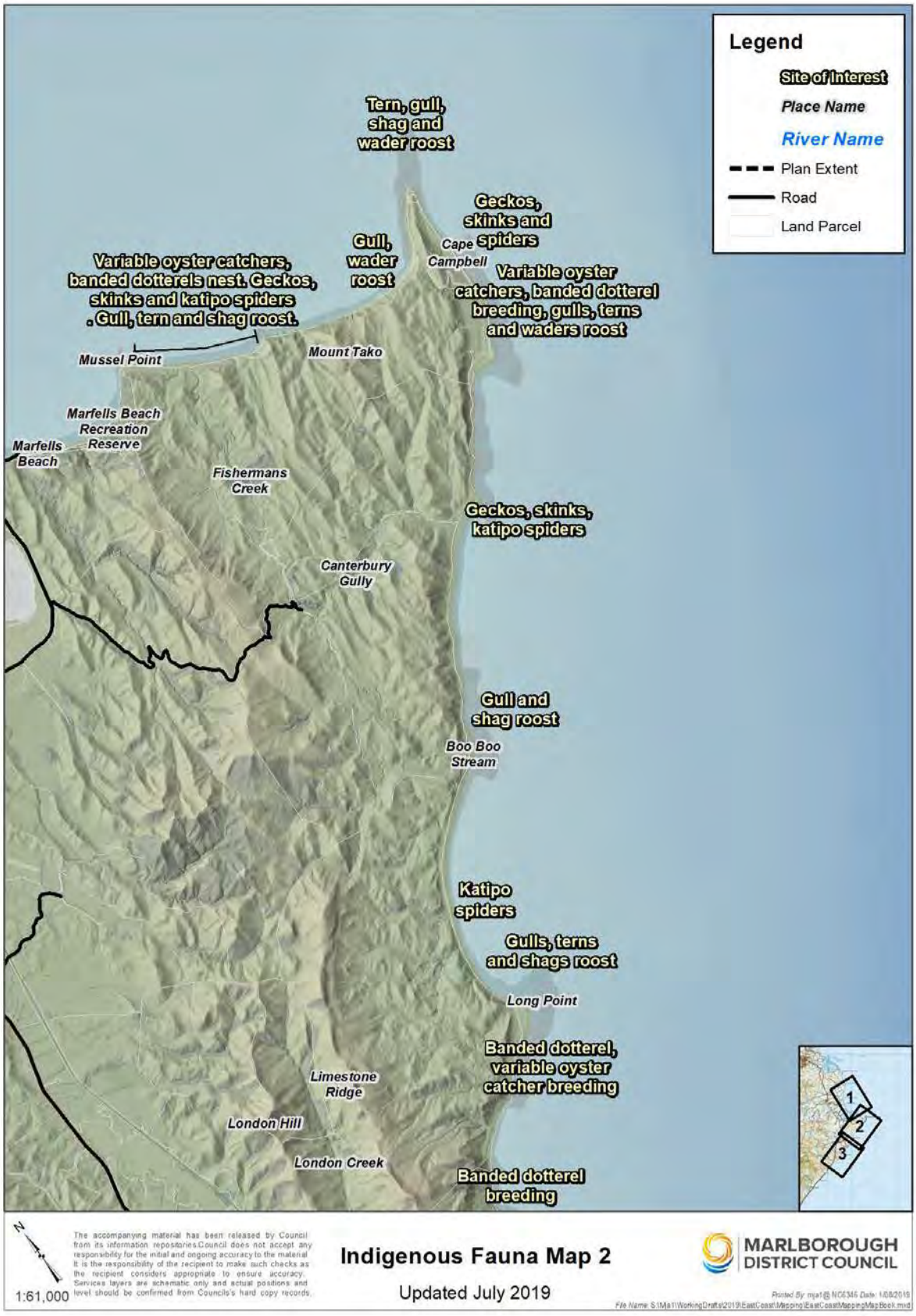
MARLBOROUGH DISTRICT COUNCIL
Printed By: mja1@ NC7915 Date: 7/11/2019
File Name: S:\Mja1\WorkingDrafts\2019\EastCoast\Mapping\EastCoastMappingMapBook.mxd

Appendix 7: Indigenous Fauna


Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
Tern, gull, shag and wader roost
Geckos, skinks and spiders
Gull, wader roost
Cape Campbell
Variable oyster catchers, banded dotterels nest. Geckos, skinks and katipo spiders . Gull, tern and shag roost.
Variable oyster catchers, banded dotterel breeding, gulls, terns and waders roost
Mussel Point
Mount Tako
Marfells Beach Recreation Reserve
Marfells Beach
Fishermans Creek
Geckos, skinks, katipo spiders
Canterbury Gully
Gull and shag roost
Boo Boo Stream
Katipo spiders
Gulls, terns and shags roost
Long Point
Banded dotterel, variable oyster catcher breeding
Limestone Ridge
London Hill
London Creek
Banded dotterel breeding
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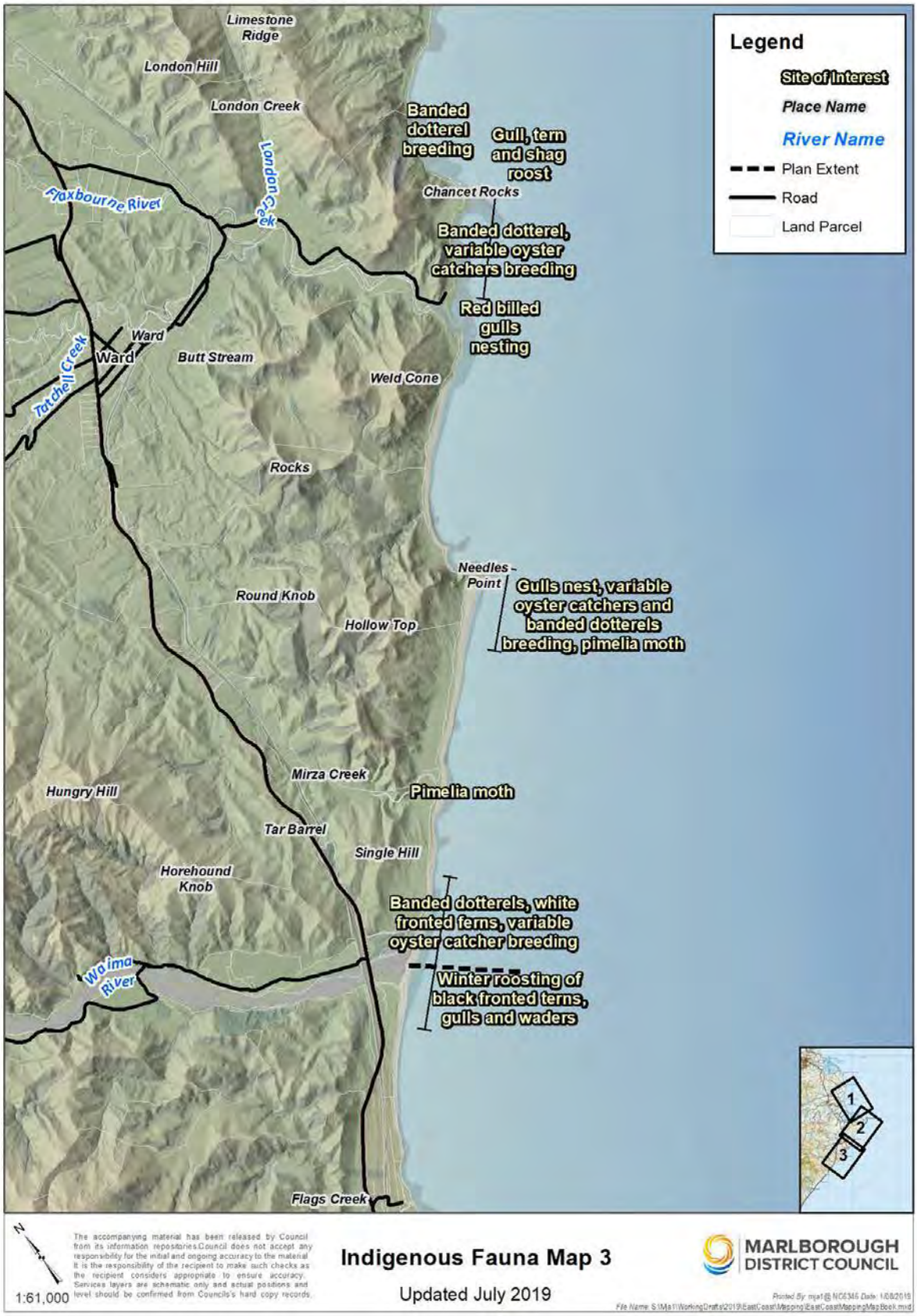
Indigenous Fauna Map 2
Updated July 2019
MARLBOROUGH DISTRICT COUNCIL


Limestone Ridge
London Hill
London Creek
Banded dotterel breeding
Gull, tern and shag roost
Chancet Rocks
Flaxbourne River
London Creek
Banded dotterel, variable oyster catchers breeding
Red billed gulls nesting
Ward
Ward
Butt Stream
Tatchell Creek
Weld Cone
Rocks
Needles Point
Gulls nest, variable oyster catchers and banded dotterels breeding, pimelia moth
Round Knob
Hollow Top
Mirza Creek
Pimelia moth
Hungry Hill
Tar Barrel
Single Hill
Horehound Knob
Banded dotterels, white fronted terns, variable oyster catcher breeding
Winter roosting of black fronted terns, gulls and waders
Wairau River
Flags Creek
Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
1
2
3
N
1:61,000
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Indigenous Fauna Map 3
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Appendix 8: Marine Ecosystems

Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
Hard sand beach
Cape Campbell
Mudstone reef, kelp beds
Pipi beds
Crayfish, paua
Mussels
Mussel Point
Mount Tako
Hard sand beach
Marfells Beach Recreation Reserve
Marfells Beach
Fishermans Creek
Canterbury Gully
MARFELLS BEACH ROAD
CAPE CAMPBELL ROAD
Mudstone Reef
Boo Boo Stream
Crayfish, paua
Pea gravel beaches
TAIMATE ROAD
Mudstone reef
Long Point
Crayfish, paua
Kelp beds
Limestone Ridge
STATE HIGHWAY 1
London Hill
London Creek
1
2
3
N
1:61,000
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Marine Ecosystems Map 2
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Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
Limestone Ridge
London Hill
London Creek
London Creek
WARD BEACH ROAD
Flaxbourne River
KAKA ROAD
NEEDLES ROAD
CLERMONT STREET
Ward
Ward
Butt Stream
Tatchell Creek
HIGHWAY 1
STATE
Scientific Reserve
Chancet Rocks
Limestone reefs
WARD BEACH ROAD
Ward Beach
Weld Cone
Rocks
Needles Point
Limestone outcrops/reefs
Round Knob
Hollow Top
Flat gravel dunes/beach
STATE HIGHWAY 1
Mirza Creek
Hungry Hill
Tar Barrel
Single Hill
Horehound Knob
Limestone gravel river mouth
Waima River
URE ROAD
URE ROAD
HIGHWAY 1
STATE
STATE HIGHWAY 1
Flags Creek
1
2
3
N
1:61,000
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Marine Ecosystems Map 3
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Appendix 9: Marine Mammals

Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
New Zealand Fur Seals breeding
Cape Campbell
Elephant seal breeding
Mount Tako
Mussel Point
Marfells Beach Recreation Reserve
Marfells Beach
Fishermans Creek
Canterbury Gully
MARFELLS BEACH ROAD
CAPE CAMPBELL ROAD
Boo Boo Stream
TAIMATE ROAD
Long Point
Limestone Ridge
STATE HIGHWAY 1
London Hill
London Creek
1
2
3
N
1:61,000
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Marine Mammals Map 2
MARLBOROUGH DISTRICT COUNCIL

Legend
Site of Interest
Place Name
River Name
Plan Extent
Road
Land Parcel
Limestone Ridge
London Hill
London Creek
New Zealand Fur Seals haulout
Chancet Rocks
WARD BEACH ROAD
Foxbourne River
KAKA ROAD
NEEDLES ROAD
CLERMONT STREET
Ward
Ward Beach
Butt Stream
Weld Cone
Tatchell Creek
HIGHWAY 1 STATE
Rocks
New Zealand Fur Seals breeding
Round Knob
Hollow Top
STATE HIGHWAY 1
Mirza Creek
Hungry Hill
Tar Barrel
Single Hill
Horehound Knob
Waima River
URE ROAD
Flags Creek
1
2
3
1:61,000
Marine Mammals Map 3
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Bibliography

Boffa Miskell, 2015. Marlborough Landscape Study. Landscape Characterisation and Evaluation.

Dugdale, JS, 2001. Cloudy Bay coastal habitats. Entomological values of the foreshore and associated inland habitats. DOC

Jones, C. and Hutzler, I.; 2002. Threatened Plants of South Marlborough; A Field Guide. DOC.

Lettink M.2018 Lizard Values East Coast Protection Area.

McCahon, S, 2015. Editor: Marlborough Landscape Study.

Millar Ian 2018. Cape Campbell Coastline: invertebrates of conservation interest. 18158113

Patrick, BP, 2002 Conservation status of the New Zealand red katipo spider Latrodectus katipo Powell, 1871). Department of Conservation.

Schiel, D R. Diversity, values, threats and risks on rocky reefs 1.5 years after the Kaikōura earthquake.18149410

Walls, G. What makes Cape Campbell special.2018 Report to Council Record No 18107147

Walls, G. SNA Reports on file at Council.

Wichman Larnce Cape Campbell Fishers Report 26 July 2018 Council Record No 1951242

References

18149193 Mike Bell PPT Marlborough East Coast Birds

18164201 Bird Survey Table Andrew John