

Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area surrounds Raglan /Whaingaroa Harbour and includes the settlement of Raglan and the gently undulating pastoral grazing land. The harbour itself extends for a long distance inland and has a largely unmodified landform, with a narrow neck and mouth relative to the size of the harbour. The surrounding watercourses drain into the harbour, and as a result, the margins are highly indented and alluvial. Raglan or Whaingaroa Harbour supports a number of areas of indigenous vegetation, which are principally located within the inner parts of the harbour. Access to the harbour is provided by State Highway 23 and the Ohautira Road. The Paritata Peninsula is a significant prominent focus central to the harbour as is the large sand dune on the northern side of the harbour mouth.

Key coastal characteristics include: The settlement of Raglan; highly indented estuarine coastline contained by undulating rural pastoral land; noted areas of indigenous bush, the prominent feature of Karakaringa on the Paritata Peninsula; the numerous watercourses that drain the surrounding coastal context and their associated river channels; largely undeveloped.

Beyond the coastal environment, the coastal context contains the pastoral hinterland of rural Waikato including the largely indigenous area of Kokako.

Below: Dunes near Te Kaha Point, immediately north of the harbour mouth



Abiotic

Whaingaroa Harbour covers 33km² with a catchment area of 525km². With 70% of the harbour being intertidal and exposed at low tide a number of the upper arms of the catchment from the upper reaches of the intertidal zone.

The north harbour mouth forms an extensive sand dune system that is rich in ironsands along with dune dammed lakes. The dune system transitions to an inner harbour landscape of headlands and embayments that are a mix of native bush and agricultural grazing land cover types. The land form comprises gentle to moderately steep rolling landscape of headlands and

Rivers running into the harbour include Opotoru River, Waingaro River, Tawatahi River and Waitetuna River. The Waingaro River is one of the largest sources of sediment for the Whaingaroa Harbour.

The area is well known for its limestone geology with tomo located throughout the upper areas of the harbour’s headlands.

Below: Forest Remnant close to Tawatahi River



Biotic

Land cover analysis: The total land area of the Whaingaroa Coastal Terrestrial Area is 7,988ha. Almost 70% of the land cover is rural production land with a further 2% being plantation forestry and cropland. Twelve percent is indigenous vegetation, principally manuka/kanuka with a small amount of wetland and indigenous forest. Of the remainder, 3% is lake/pond/river and sand/gravel/rock, 4% is urban area and parkland, and 4% is gorse/broom.

Compared to the open coastline, the greywacke landform that defines Whaingaroa Harbour is relatively stable and subject to long term processes of fluvial erosion and harbour sedimentation. As a result the entire Coastal Terrestrial Area would originally have been completely covered in mature indigenous coastal forest with saltmarshes at the coastal fringe and small raupo or sedge wetlands in the narrow, entrenched gullies. Because the ridgelines and streams fall to the harbour edge at a relatively steep gradient, there are few lowlying floodplain areas or land drainage networks, and the landform remains relatively natural. However, apart from isolated patches of regenerating shrubland or reverting gorse, there is very little indigenous vegetation cover. Over the past 20 years there has been significant effort locally to replant the riparian margins of the catchment feeding the harbour as part of the Whaingaroa Environment Catchment Plan.

The forest remnants have fragments of more mature canopy, but vegetation is typically recent and comprised mainly of maturing scrubland with canopy species beginning to emerge. These include bush areas identified as key ecological sites by Waikato Regional Council located at the Kerikeri and Waingaro River and Ohautira Stream outlets north of Ohautira, along with a scenic reserve and several QEII covenants. Much of the Harbour fringe has been fenced and either planted or allowed to revert to indigenous shrubland. These areas are typically very narrow and often fragmented, but transitions to coastal rushland and sea meadows.

On the northern side of the Harbour mouth is a large duneland overlying the greywacke strata that provides a less stable substrate for vegetation. As for Waikato North, this is likely to have been historically vegetated with indigenous forest in varying states of succession, but is currently predominantly exotic duneland reverting to gorse, as is much of the land to the north. East of this are wetland and bush fragment mosaics identified Waikato Regional Council as key ecological sites.

Most streams discharging to the Harbour are generally first- and second-order perennial streams, but 12 are larger waterways with catchments extending well beyond the coastal zone. The streams are generally incised in gully networks with relatively unmodified channels. Many have been fenced from livestock and planted through the Whaingaroa Harbourcare programme, although most of the steep and less accessible first- and second-order streams remain unprotected, and some have been dammed for livestock water supply. Unprotected streams will be affected by the lack of riparian cover, livestock access, erosion, sedimentation, enrichment, and a lack of suitable instream habitat (e.g. woody debris and aquatic plants).

Farm tracks and road culverts may present some barriers to fish passage, but most streams offer a relatively natural habitat for a diverse range of freshwater fish, and access will be possible for fish migrating to and from Whaingaroa Harbour.

Experiential

Large parts of the northern harbour margins are in private ownership and are inaccessible to public. Modification to the harbour margins is consistent with rural farm dwellings, structures and jetties occupying the shoreline. The southern extent of the harbour is heavily modified with the settlement of Raglan which includes wharves, bridges, residential settlement and industrial activities.

Human modification is apparent in the northern and western margins of the area through activities mainly associated with productive farming. Despite the modification the many arms of the harbour create a sense of isolation and visual disconnect with the modified areas of the Coastal Terrestrial Area. Headlands and embayments in the northern and western areas of the harbour that are covered in native bush create a strong sense of remoteness along this coast with the natural processes dominating the experience.

The natural patterns are evidence at many scales with evidence of coastal erosion more evident along the modified areas of the coastal terrestrial area. The northern head of the harbour mouth is expressive of the natural processes particularly during high winds.

*Below: Forest remnant within
The Finger, Haroto Bay*



Rating at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High			
Moderate to High			
Moderate	✓		✓
Moderate to Low		✓	
Low			
Very Low			
Overall Natural Character Rating			Moderate

Below: Silo associated with Ann Point, Raglan



Natural Character Study of the Waikato Coastal Environment

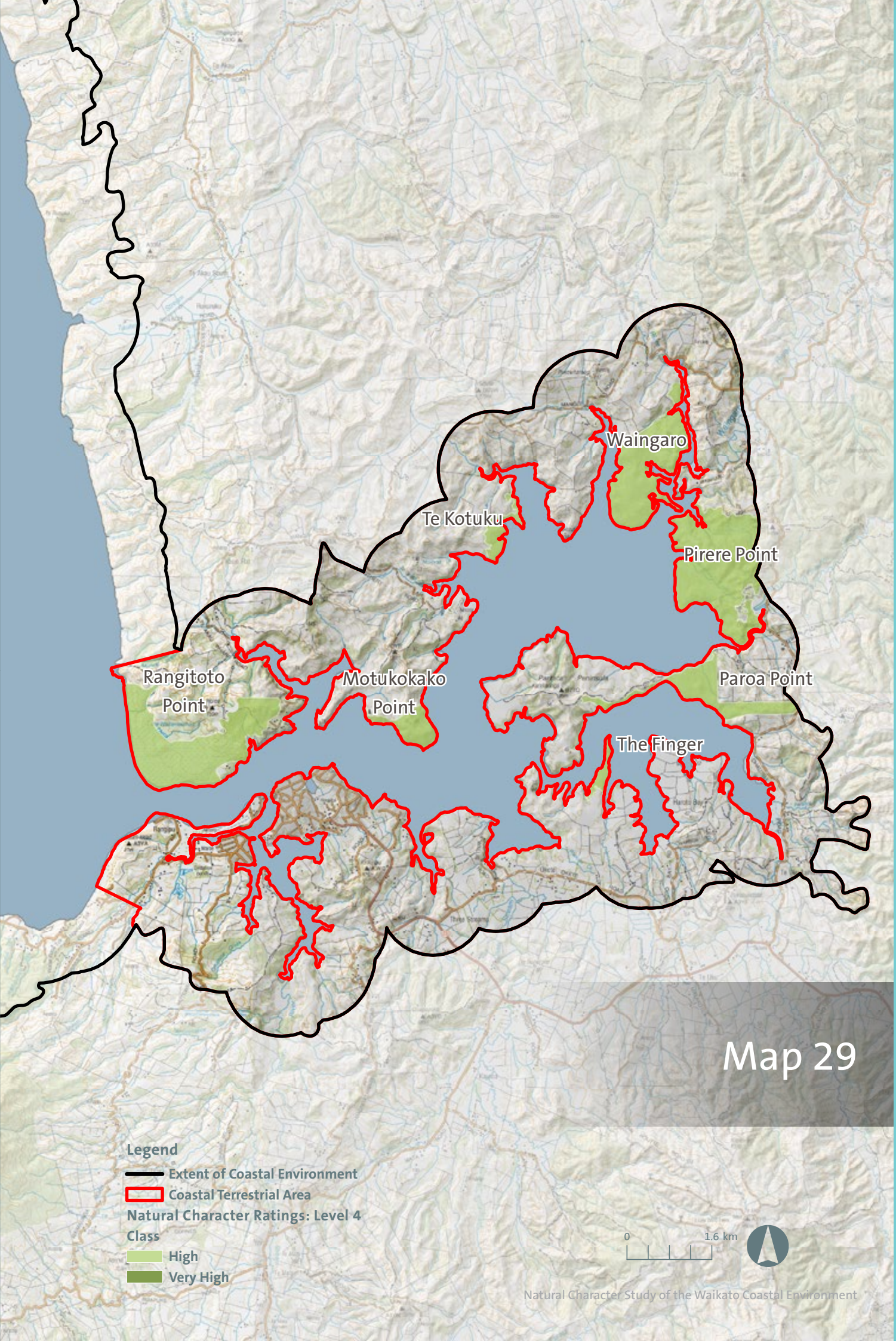
Coastal Terrestrial Area 17: Whaingaroa Specific Characteristics at Level 4

These are mapped with reference to **Map 29**

Area	Rating	Key Values	Additional Comments
Rangitoto Point	High	<ul style="list-style-type: none">The dynamic dune system extends from coastal edge to the inner harbour with natural patterns remaining intact. Vegetation cover is a mix of native and weed species. The natural dune processes are evident throughout and most apparent along the margins of the feature. A moderate sense of remoteness is evident within the feature.	<ul style="list-style-type: none">Farming around the point and settlement along the inner harbour margins introduce modification to the natural abiotic and biotic sequencing of the dune system.
Motukokako Point, Te Kotuku, Waingaro, Pirere Point, Paroa Point and The Finger	High	<ul style="list-style-type: none">Biotic values of comprehensive areas of regenerating native bush along the inner harbour headlands. Interspersed with estuarine vegetation including sequencing from coastal bush, to saltmarsh to mangrove habitats.	<ul style="list-style-type: none">Margins of the areas are defined by adjoining land use rather than natural patterns. Modification is largely in the form of access tracks and grazing of wild stock and pests underneath the canopy.

Below: Waingaro River and its estuarine margin and vegetated headland.





Map 29

- Legend**
- Extent of Coastal Environment
 - Coastal Terrestrial Area
 - Natural Character Ratings: Level 4 Class**
 - High
 - Very High

0 1.6 km



Karioi

COASTAL TERRESTRIAL AREA 18:



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

Located immediately south of Raglan (Whaingaroa) Harbour and north of Aotea Harbour, this Coastal Terrestrial Area includes the northerly and westerly flanks of the extinct volcano of Karioi and the predominantly straight coastal duneland associated with Ruapuke Beach. Within the crumpled topography of the lower slopes of Karioi is the Te Toto Gorge, where a walking track extends in elevation to the top of the volcano. Access is provided by the Whaanga Road around Mt. Karioi with numerous other roads connecting the southern part of this Coastal Terrestrial Area. The majority of this Coastal Terrestrial Area is pastoral farming with areas around Mt. Karioi being predominantly indigenous.

Key coastal characteristics include: The indigenous vegetated lower slopes of Mt. Karioi; the Te Toto Gorge area; the predominantly straight coastal edge of the southern section of this Coastal Terrestrial Area and its associated dunelands; predominantly pastoral land use with indigenous vegetation flanking parts of Mt. Karioi; access being provided by the Whaanga Road; any settlement associated with farms and satellite houses located off the small number of roads.

Beyond the coastal environment, the coastal context to the north comprises the vegetated elevated slopes of Mt. Karioi. To the south are the pastoral undulating lands of Ruapuke.

Below: The prominent peninsula of Papanui Point



Abiotic

This Coastal Terrestrial Area includes the extinct volcano of Mt. Karioi, in the north and the ancient sands and siltstones in the south. Mt. Karioi forms a backdrop to the Whaingaroa Harbour and settlement of Raglan. It is dissected by deep ravines that radiate from the summit and terminate, on the western side, in towering coastal cliffs (Woody Head) that expose basaltic lava interbedded with volcanic fragmental material penetrated by andesitic dikes.

A particular feature of this is Te Toto Gorge, a geopreservation site. This feature comprises up to 15 lava flows which make up the 150m cliffs of the Gorge which display many large augite crystals up to 15mm. Other features of the Mt. Karioi volcanics include Papanui Point and a lava flow section at Whale Bay.

Topographically the area is rugged with a rocky shoreline around Mt Karioi before transitioning to steep cliffs and ironsand beaches further south. The inland coastal area is undulating and expressive of the coastal erosion processes occurring along the west coast. To the south, beyond the volcanics of Mt. Karioi, are the beach and dune deposits containing titanomagnetite (iron sands).

Below: Vegetated coastal cliffs of Mt Karioi



Biotic

Land cover analysis: The total land area of the Karioi Coastal Terrestrial Area is 3,218ha. More than 51% of the land cover is rural production land. Indigenous vegetation covers over 42% and is principally comprised of indigenous forest, with small proportions of flaxland, manuka/kanuka and other scrub. Of the remainder, 3% is sand/gravel, 1% is gorse/broom, and <1% is urban area.

Both the volcanic landform of Karioi and the sedimentary rock strata to the south are relatively stable and subject to long term processes of fluvial and coastal erosion. As a result the entire Coastal Terrestrial Area would originally have been completely covered in mature coastal, lowland, and submontane indigenous forest with very narrow dunelands at stream outlets to the coast, and small raupo or sedge wetlands in the narrow, entrenched gullies. Because the ridgelines and streams fall away from Karioi or towards the coast at a steep gradient, floodplain or land drainage areas are very limited, and the landform remains relatively natural. Although the Karioi forests are a dominant feature of the Coastal Terrestrial Area, elsewhere there is very little indigenous vegetation cover, apart from isolated small patches of regenerating forest and the coastal cliff communities. However, threatened plants *Hebe speciose* and Cook's scurvy grass have been reintroduced to the Te Toto Gorge.

Waikato Regional Council identifies parts of the Karioi forest and riparian areas as key ecological sites, and the remaining area is protected by scenic reserve and conservation park status. There are also several QEII covenant areas. Waikato Regional Council also identifies the Matawha Point coastal cliffs as a key ecological site, and part of this area, along with most of the adjacent headland north of Ruapuke Stream, is also protected by a QEII covenant. The coastal cliffs from Woody Head to the southern side of Papanui Point are protected by a marginal strip.

Almost all streams discharging to the coast are first- and second-order perennial streams, and only two have catchments extending beyond the coastal zone. The streams follow the topography, and are incised in gully networks with relatively unmodified channels except close to roads. Few have been fenced from livestock, although most of those on Karioi benefit from the indigenous forest cover and reserve status, and will have very high ecological values. Unforested streams will be affected by the lack of riparian cover, livestock access, erosion, sedimentation, enrichment, and a lack of suitable instream habitat (e.g. woody debris and aquatic plants).

Farm tracks and road culverts may present some barriers to fish passage, but most streams offer a relatively natural habitat for a diverse range of freshwater fish. Like Opura, depending on their location and stream size, the catchments either have narrow floodplains close to sea level, or steeper incised catchments dominated by gullies elevated well above sea level and discharging to the coast via waterfalls. For elevated streams, access may only be possible for climbing species, but for streams with flatter gradients access will be possible for a wider range of aquatic fauna. Along the open coastline, the few dunelands or intertidal areas offering food resources or breeding areas for shorebirds are generally associated with stream outlets.



Right: Ruapuke stream

Experiential

Residential and rural residential settlement are focused to the coastal edge near Whale Bay with some properties extending along the spurs and ridges of Mt Karioi footslopes. The coastal margin of Karioi is highly expressive of the natural processes and patterns occurring along the coastline and on the mountain.

Fingers of native bush extend down the valleys toward the coast providing connection of the native coastal bush to the shoreline.

DOC walking tracks extend around the coastline with DOC facilities located along the lower coastal slopes of Mt Karioi. Modification is apparent along the lower slopes with agricultural grazing interspersed along the shoreline of Mt Karioi. Further modification along the lower footslopes is in the form of access tracks, both for pedestrians and off road vehicles.

Further south the landform transitions back to low to moderate rolling landscape with remnant dune systems that extend inland. Farming landuse is dominant and coastal vegetation patterns relatively sparse. The natural patterns and elements dominate only in areas where agricultural land use is difficult to achieve.

Access to this area is limited to private access only with public access only to Ruapuke Beach.

*Below: Vegetated coastal cliffs of
Woody Head*



Rating at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High			
Moderate to High	✓		✓
Moderate		✓	
Moderate to Low			
Low			
Very Low			
Overall Natural Character Rating			Moderate

Below: Coastal vegetation within the steep, rocky coastal gullies



Coastal Terrestrial Area 18: Karioi Specific Characteristics at Level 4			
These are mapped with reference to Map 30			
Area	Rating	Key Values	Additional Comments
Karioi	Very High	<ul style="list-style-type: none">Volcanic cliff faces extending steeply toward summit of Mt Karioi. The natural processes are evident with the volcanic formations evident from coast to summit. Biotic elements comprise dominant native bush cover extending down to the coastal edge and along the cliffs. A highly remote experience dominated by the natural processes occurring.	<ul style="list-style-type: none">Modification is interspersed amongst the vegetation patterns with open grazing areas, vehicle and walking tracks.
Ruapuke and Rahanui Beaches	High	<ul style="list-style-type: none">Valley floor dune systems comprising elevated dune sheets and dune systems extending inland to meet wetland systems. Vegetation cover is a good example of sequencing from coastal dune to coastal shrub species. The entire beach and coast is remote with limited public access.	<ul style="list-style-type: none">Full sequencing of dune system is interrupted by adjoining land use of farming. Areas not farmed are largely associated with highly dynamic coastal processes.Public access is gained off the access road near the Ruapuke Motor Camp.

Below: Rahanui Beach Dunes



Legend

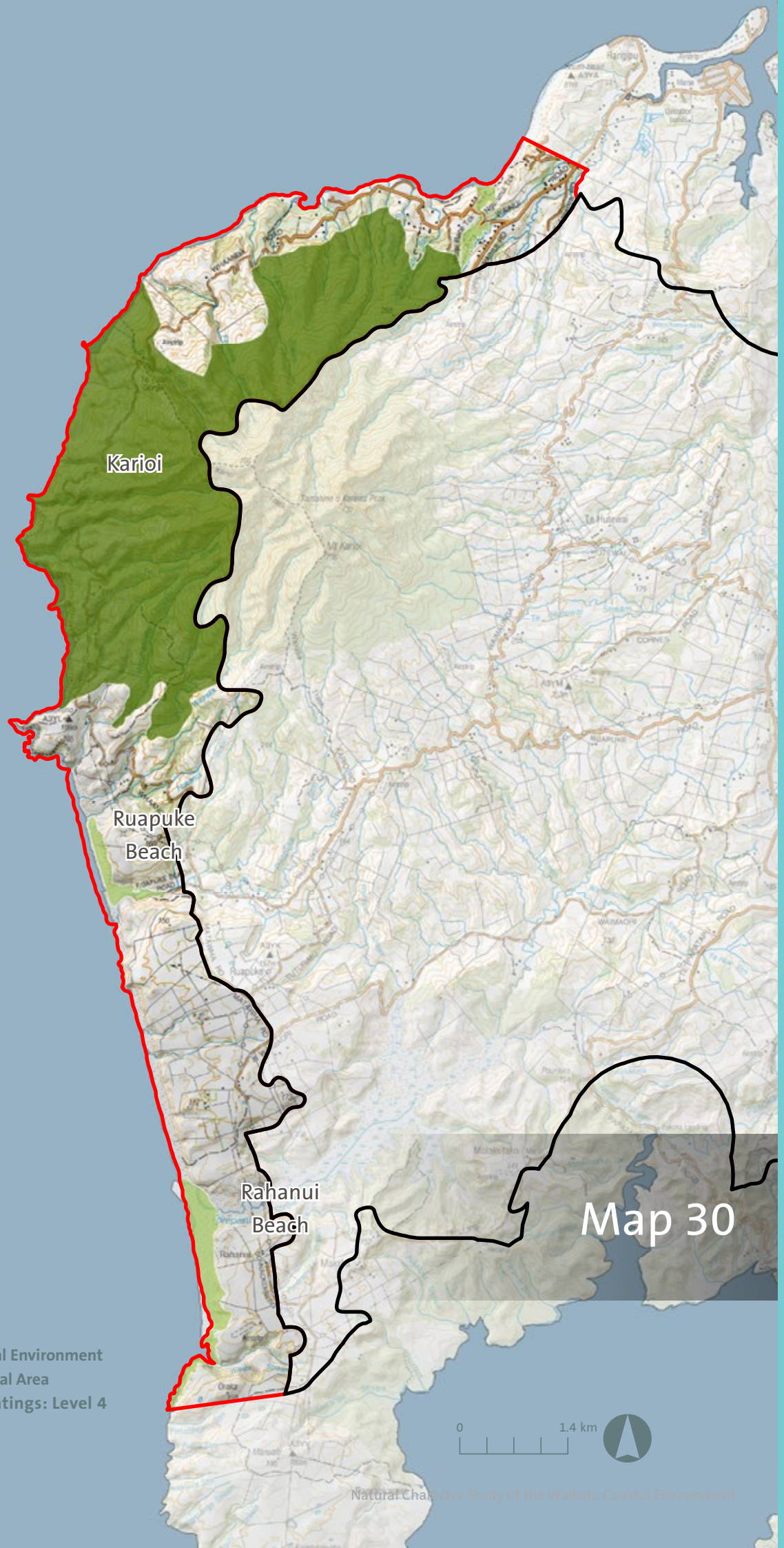
— Extent of Coastal Environment

▭ Coastal Terrestrial Area

Natural Character Ratings: Level 4 Class

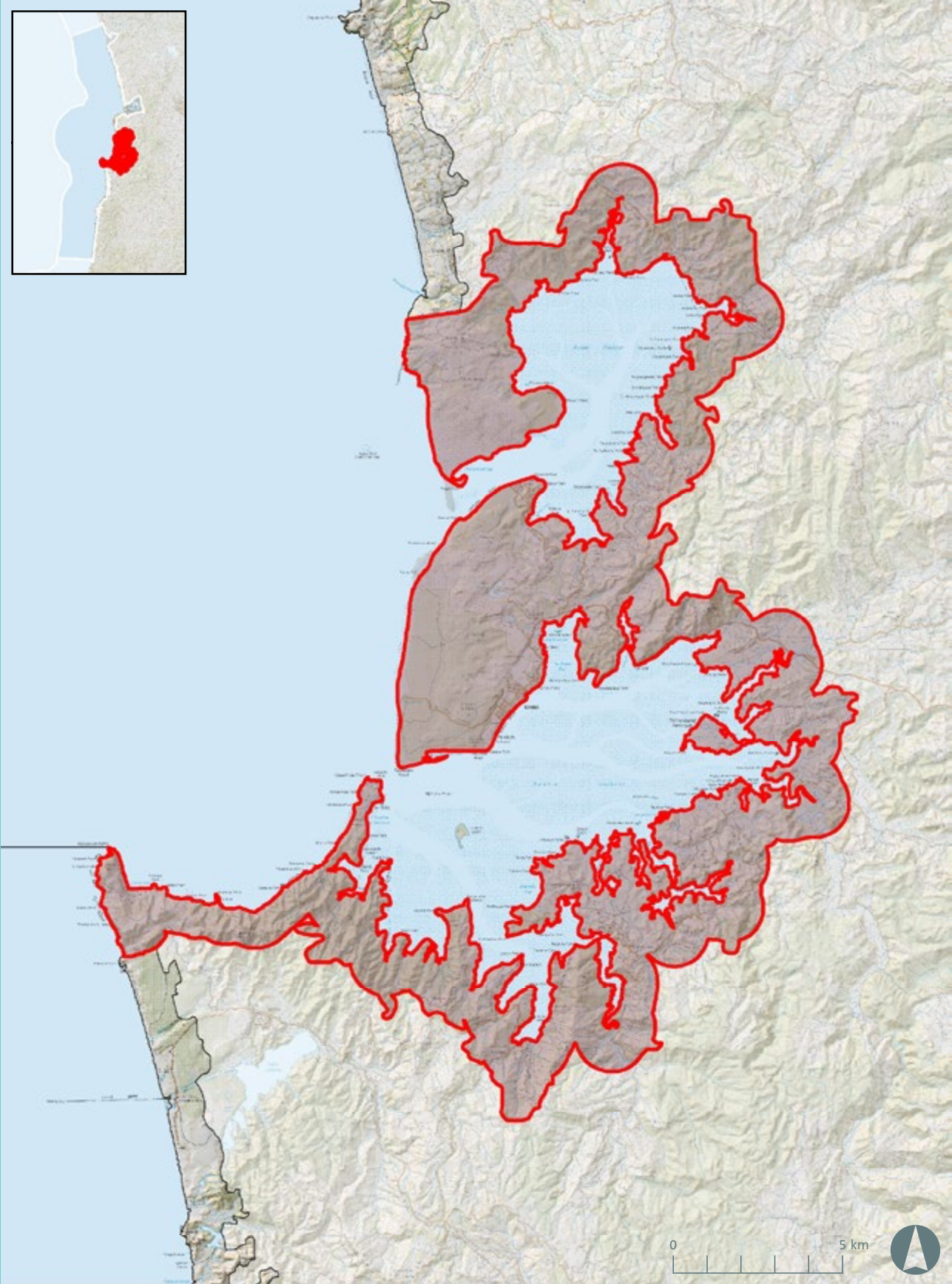
▭ High

▭ Very High



Aotea and Kawhia

COASTAL TERRESTRIAL AREA 19:



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area encompasses the land associated with both the predominantly sheltered harbours of Aotea and Kawhia. These two prominent inlets retain very different characteristics. Aotea Harbour features the Aotea dune fields, which are considered a geopreservation site of national importance. The larger Kawhia Harbour is highly indented, with numerous slender peninsulas extending into the harbour waters. Much of this land is used for pastoral land use, however there are significant stretches of indigenous vegetation found around both harbours. Access is provided principally from State Highway 31 (the Kawhia Road) with numerous other roads providing access to the majority of this Coastal Terrestrial Area. The principal settlement is Kawhia, although smaller more rural settlements such as Aotea, Okapu, Te Waitere and Kinohaku are located off the main roads.

Key coastal characteristics include: Impressive dunelands associated with the northern mouth of Aotea Harbour; highly indented Coastal Terrestrial Area, especially around Kawhia Harbour, land predominantly used for pastoral land use, however significant tracts of indigenous areas apparent; numerous small settlements, including Kawhia and Aotea; access provided to most of the Coastal Terrestrial Area by the numerous roads; and provides a relatively sheltered coastal experience.

Beyond the coastal environment is the rural undulating hinterland of Waikato, where numerous small roads connect the many farmsteads. Some 18km to the east of both harbours is the indigenous vegetated extinct volcano of Pirongia, which clearly punctuates the Waikato rural landscape.

Below: Looking west along Aotea Harbour



Abiotic

This Coastal Terrestrial Area is associated with the ancient Jurassic rocks, some of which are exposed south of Kawhia Harbour. The Jurassic rocks are principally fossiliferous and siltstone, however sandstones and conglomerate also form prominent strike ridges locally.

The principal features of this Coastal Terrestrial Area are the Aotea and Kawhia Harbours which are drowned valley system following post glacial Aranuian sea level rise, which have also been influenced by numerous faults. Much of the sands contain a high iron content, with some mining occurring at Taharoa, south of Kawhia Harbour.

Topographically the area is reasonably low-lying, however gently undulating terrain broadly contains these harbours. The highest part of this Coastal Terrestrial Area is along the southwestern part of Kawhia Harbour, where the land rises to approximately 250 metres above sea level. Much of the developed parts of the harbours are on the more level, lower-lying areas, such as coastal sands and alluvial deposits.

There are a number of geopreservation sites associated with this Coastal Terrestrial Area. The principal site in Aotea Harbour is the dune fields at the northern mouth. This impressive, nationally significant and well-defined landform of mobile sands is the largest example on the northwest coast.

Further south, within Kawhia Harbour are the sequence of Jurassic exposed rocks, which individually and collectively are considered of national importance. These rock features are noted for their exposure where the formative processes are clearly evident. In all there are eleven geopreservation sites associated with this group. Motutara Peninsula Jurassic and

Below: Ripples created on the Potahi Point sand dunes at the mouth of Aotea Harbour



Oligocene sediments (B3); Puti Point Jurassic fossiliferous siltstone (B3); Kawarua anticline (C3); Te Maika Point Jurassic Sequence (B2); Totara Point and Capt. King Shell bed Jurassic fauna (B2); Ohaua Point Jurassic fauna (B3); Heteri Point Jurassic macrofossils (B3); Ururoa Point Jurassic Dactylioceras beds (B3); Arataura Point Jurassic sequence (B3); Anaomaki Point volcanic sequence; Waiharakeke bridge – Kinohaka Jurassic sediments (C3); Puarua Creek Kawhia Jurassic fossil locality (B3)¹⁴.

There is also a nationally significant geopreservation site at Albatross Point, which illustrates a reasonably well exposed syncline showing geomorphic expressions of dip slopes.

Biotic

Land cover analysis: The total land area of the Aotea and Kawhia Coastal Terrestrial Area is 16,462ha. Almost 50% of the land cover is rural production land with a further 10% being plantation forestry. Indigenous vegetation forms nearly 32% of the cover, principally comprised of forest and manuka/kanuka scrub, with small areas of wetland and estuarine vegetation. Of the remainder, 5% is estuarine open water, lake/pond, and sand/gravel. Gorse/broom covers 2% and there are also very small areas (<1%) of iron sand mine, urban area/park and cropland.

Like Whaingaroa Harbour, the Kawhia/Aotea Harbour landforms are relatively stable and subject to long term processes of fluvial erosion and harbour sedimentation. The exception is the dynamic harbour mouths and associated dunelands. While most of the Coastal Terrestrial Area would originally have been covered in mature coastal indigenous forest with saltmarshes at the coastal fringe and extensive freshwater wetlands in the gullies, the dunelands would have provided less stable substrate covered with successional and dune vegetation. Waikato Regional Council identifies the Potahi Point sand spit and Rauiri Head dune scrubland/saltmarsh mosaic on the northern side of Aotea Harbour mouth as key ecological sites¹⁵. Between these two sites, more than 500ha of dunelands are protected by the Aotea Heads Scientific Reserve.

Where higher order streams discharge to the harbours within a wider floodplain, land drainage networks have been established and wetlands/saltmarshes removed but, in general, the landform remains relatively natural. The coastal margin has been straightened and some wetland or saltmarsh areas impounded by road embankments.

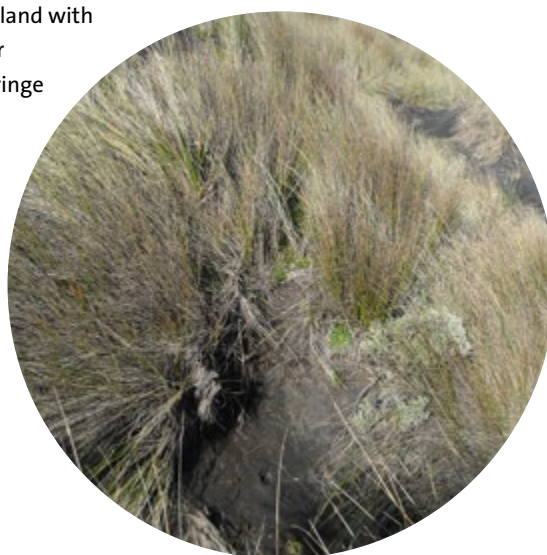
Whereas the land around Aotea Harbour has a substantial cover of regenerating indigenous forest down to the harbour margins, forest cover around Kawhia Harbour is limited to several large remnants and harbour fringe vegetation. Kawhia also has a plantation forestry, especially on the dunelands between the two harbour mouths. The forest remnants have fragments of more mature canopy, but are typically comprised mainly of maturing scrubland with canopy species beginning to emerge. However, many of the Aotea Harbour indigenous forests provide complete vegetation sequences from harbour fringe rushlands/sea meadows to coastal and lowland forest. Waikato Regional Council identifies seven areas of regenerating forest and indigenous scrubland areas around Aotea Harbour as key ecological sites covering some 930ha. In contrast, there are no key ecological sites identified around Kawhia Harbour but numerous very small scenic reserves and QEII covenants over vegetation close to the harbour margin.

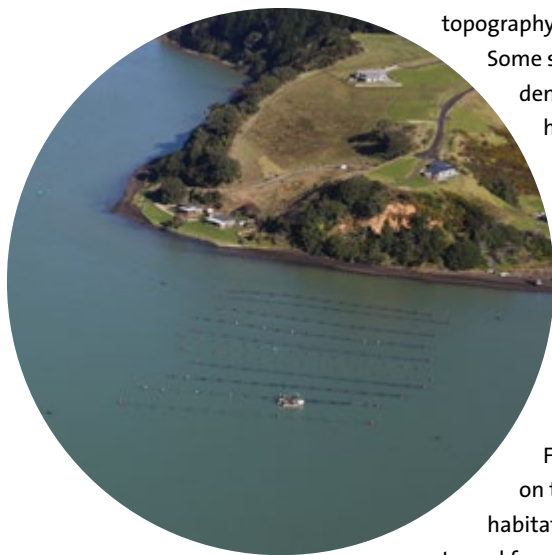
The vast majority of streams discharging to the harbours are first- and second-order perennial streams. However, there are 14 larger streams and rivers with extensive upstream catchments that extend beyond the coastal zone and for some distance inland. The streams follow the

14. Inventory and Maps of Important Geological Sites and Landforms in the Waikato Region, First Edition 1998, Geological Society of New Zealand.

15. Waikato Regional Council, GIS Database, Biosec, Under the Administration of Waikato Regional Council

Below: Typical dune plant community - spinifex, sand tussock, knobby clubrush, flax, tauhinu





Above: Aquaculture north of Pourewa Point, Aotea Harbour

topography, and are generally incised in gully networks with relatively unmodified channels. Some streams appear to have been fenced from livestock and allowed to regenerate with dense raupo wetlands. However, although most streams appear to be unfenced, many have extensive wetlands along much of their downstream reaches indicating that water levels are high enough to preclude stock grazing and wetland vegetation is permanent. Some of these also have forested or gorse covered headwaters and may have relatively high ecological values. Those streams around Aotea Harbour with uninterrupted forest cover from the coast to the headwaters will have very high values. Those unfenced streams without wetland vegetation or modified by drainage will be affected by the lack of riparian cover, livestock access, erosion, sedimentation, enrichment, and a lack of suitable instream habitat (e.g. woody debris and aquatic plants).

Farm tracks and road culverts may present some barriers to fish passage, especially on the larger waterways with road crossings, but most streams offer a relatively natural habitat for a diverse range of freshwater fish, and access will be possible for fish migrating to and from both harbours.

Like Whaingaroa, Aotea and Kawhia Harbours provide abundant and varied intertidal and subtidal habitat for saltwater fish, offering food resources and nurseries, conduits for migratory freshwater fish, and habitat for a multitude of exotic and indigenous waterfowl, marshbirds, and shore birds using the various mudflat, sandflat, saltmarsh and wetland habitats for feeding and breeding. Albatross Point also offers a seal haulout location for NZ fur seals and islets off Albatross Point are home to the threatened Cooks scurvy grass.

Below: Wetlands associated with Rauiri Head, Aotea Harbour



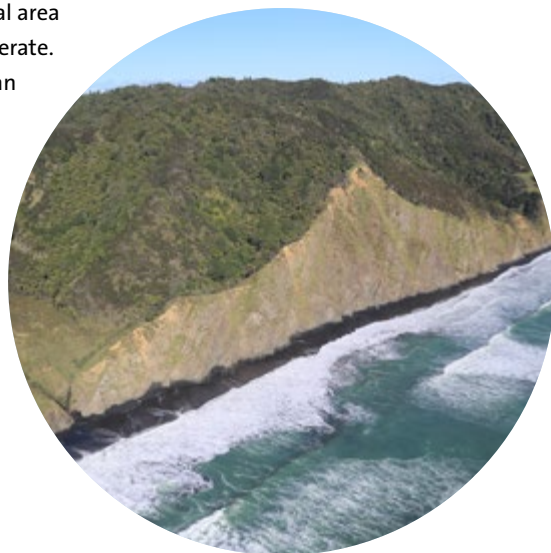
Experiential

The northern Aotea harbour mouth is highly expressive of the natural dune processes of the west coast. The sequencing of dunes, to saltmarsh to native coastal bush cover provides a strong sense of naturalness for the harbour mouth is modified with coastal reclamation, residential subdivision and structures. Human modification is apparent around the settlement of Aotea along with the productive forestry of the coastal margins between Aotea and Kawhia Harbours. The coastal ironsand dunes between Aotea and Kawhia Harbours form one of the wider coastal beach areas and is accessible to public through forestry and public reserve. The Kawhia Te Puia natural hotspots sited along the shoreline within the intertidal shoreline is frequented by the community and tourists.

Kawhia Harbour margins vary in degree of perceived naturalness with the frequency of human activities and modification occurring around the settlement of Kawhia. Land use modification occurs most frequently around the northern and eastern margins of the Kawhia harbour with the southern extent of the harbour and the embayments remote, isolated and inaccessible. Some areas with headlands and native bush cover are expressive of the natural processes and patterns. Parts of the coastal terrestrial area provide high levels of perceived naturalness whilst other areas are low to moderate. Low to moderate perceived naturalness is attributed to areas of pasture, human settlement and infrastructure including roading.



Above: Southern Kawhia Bush



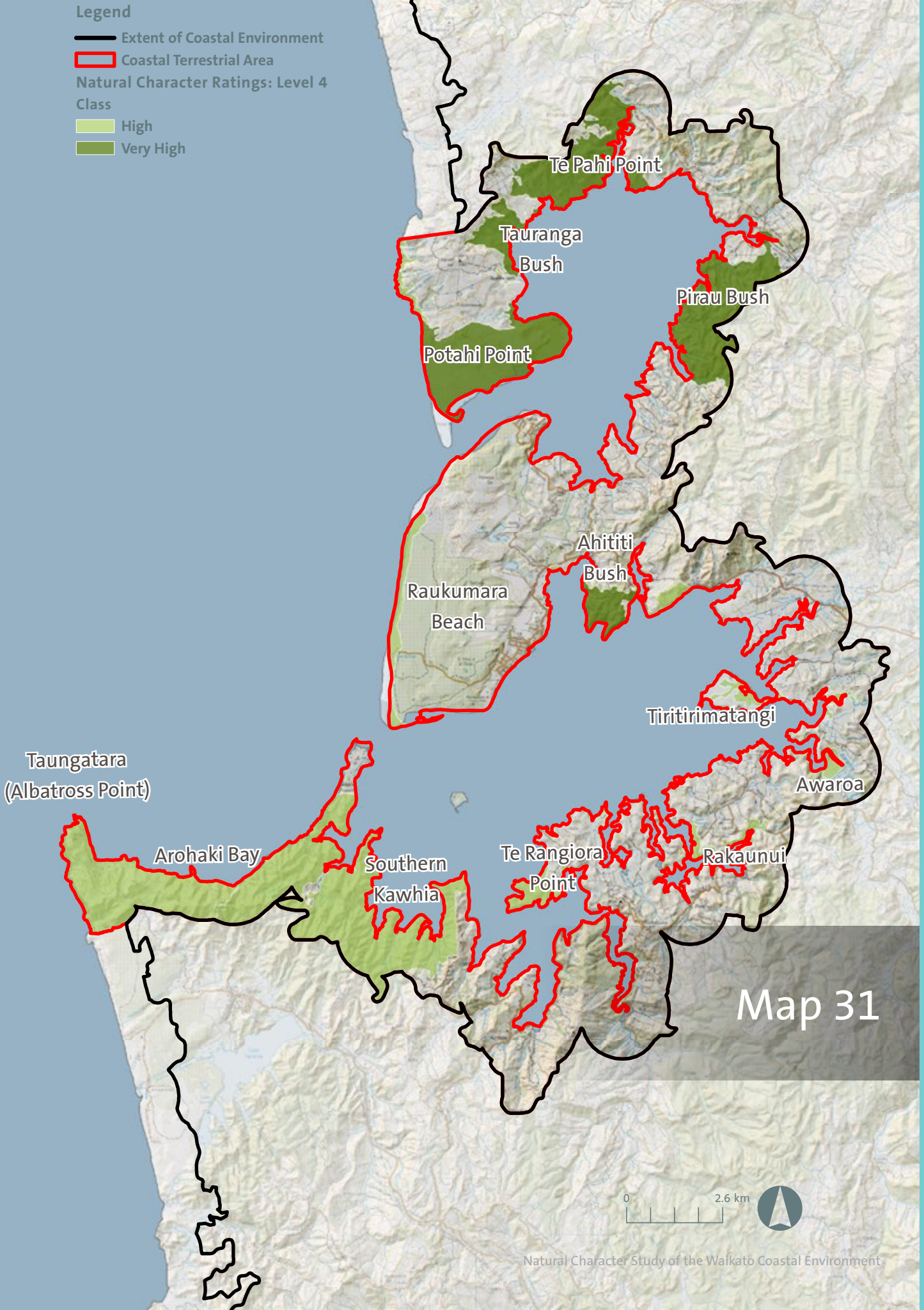
Above: Southern Kawhia Bush - Coastal Edge

Rating at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High	✓		
Moderate to High		✓	✓
Moderate			
Moderate to Low			
Low			
Very Low			
Overall Natural Character Rating			High

Coastal Terrestrial Area 19: Aotea and Kawhia Specific Characteristics at Level 4

These are mapped with reference to **Map 31**

Area	Rating	Key Values	Additional Comments
Potahi Point	Very High	<ul style="list-style-type: none">The largest sand dune headland of its type on the west coast it is highly reflective of the coastal processes. The extensive sand dunes extend from open coast to inner harbour. Vegetation sequencing is a good example of coastal dune, shrub to estuarine species. The area is extremely remote with no public access possible. The coastal experience is dominated by the coastal processes including continue dune movement.	<ul style="list-style-type: none">Modification is extremely limited with historical Maori use of the land.
Tauranga Bush, Te Pahi Point, Pirau Bush and Ahititi Bush.	Very High	<ul style="list-style-type: none">Successional native bush vegetation dominating large headland and inner harbour margins with sequencing beyond the coastal environment line. The coastal margins include coastal wetland systems (Te Pahi Point) which reflect the natural processes occurring within them. The areas are remote with little evidence of human presence or modification within them.	<ul style="list-style-type: none">Modification is apparent on the margins of the bush areas where they interface with agricultural land use.
Raukumara Beach	High	<ul style="list-style-type: none">A long ironsand beach extending from Nihinihi Point to Tauratahi Point. The dune system is steep with a wide flat black sand beach. The coastal dunes a highly dynamic and subject to coastal erosion and accretion along the length of the beach. The Te Puia hot water spring on the beach is a popular tourist and local destination at low tide. Vegetation comprises dune species backdropped by exotic forestry. A remote but popular beach for locals and tourists.	<ul style="list-style-type: none">Modification is apparent on the margins of the dune area with productive forestry impacting on the natural rear dune patterns. Access through the dunes is limited to public access off Te Puia Road.
Kawhia Harbour Coastal Bush Areas: Tiritirimatangi, Awaroa, Rakanui, Te Rangiora Point, Southern Kawhia and Arohaki Bay.	High	<ul style="list-style-type: none">The coastal margins remaining intact include coastal native bush set along headlands and inner harbour arms with the largest area comprising the southern Kawhia bush area. Intertidal areas comprise estuarine saltmarsh with margins of native bush cover.	<ul style="list-style-type: none">Modification is apparent on the margins of the bush areas where they interface with agricultural land use.



The figure is a topographic map of the study area, which is a coastal region in the Iberian Peninsula. The study area is highlighted in green and outlined in red. The map shows the coastline of Galicia and Asturias, with the Bay of Biscay to the west. The terrain is rugged, with many mountains and valleys. The map includes a scale bar (0 to 5 km) and a north arrow. An inset map in the top left corner shows the location of the study area within the Iberian Peninsula.

Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

Extending south from Kawhia Harbour to Tirua Point this Coastal Terrestrial Area retains a diverse topography, encapsulating the flat ironsands in the north and the undulating, often rugged predominantly rural terrain to the south. The principal settlement is Marokopa with access gained via Marokopa Road.

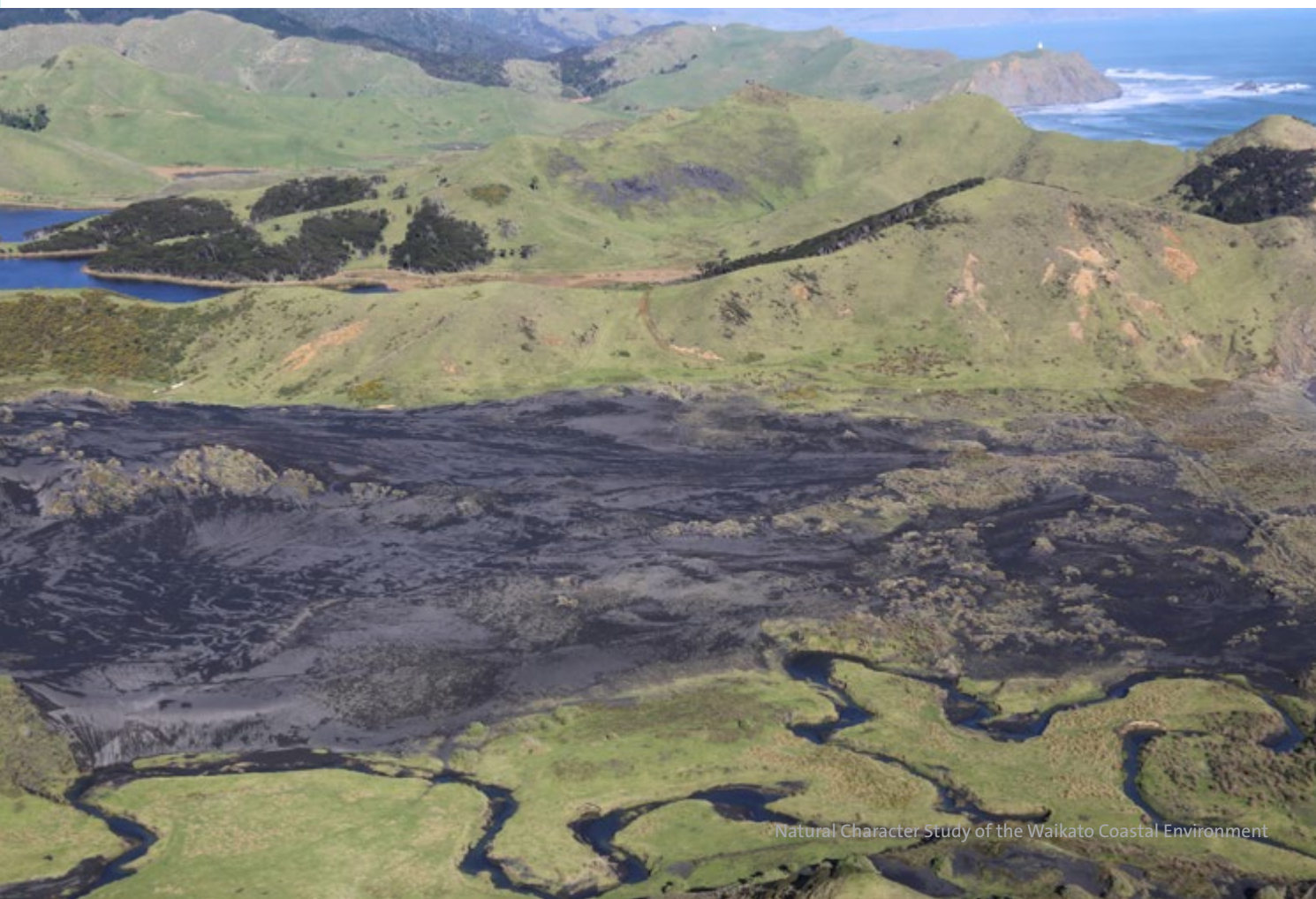
Beyond the coastal environment is the rural undulating hinterland of Waikato. There are also significant areas of ironsand dune systems and dune sheets. The coastline returns to rocky headlands with dramatic exposed sedimentation profiles to smaller coastal cliffs atop of long ironsand beaches. Small dune systems at the toe of the coastal cliffs provide some refuge for small coastal baches and access tracks.

The ironsand mine of Taharoa has modified extensively the natural processes and systems of its area. The site covers an area of 1,300 hectares segmented into three regions. Operated by NZ Steel the mining includes extracting sand from a pond by a floating dredge which is then conveyed for processing. The slurry is then pumped via a pipeline to an off-shore single buoy mooring where it is transferred to a bulk carrier fitted with dewatering equipment (*source: NZ Steel website*).

Further south other large dune systems extend large distances inland along the low lying valley floors. Along the rocky shoreline and coastal cliffs the native vegetation patterns reflect the high energy and high wind environment of the West Coast, including large areas of windswept native vegetation.

The Coastal Terrestrial Area is depicted by its large coastal cliffs with ironsand sheets atop and large coastal ironsand dune systems with rear dune wetlands.

Below: Parihaki Dunes



Abiotic

This Coastal Terrestrial Area is associated with the ancient Jurassic rocks. The Jurassic rocks are principally fossiliferous and siltstone, however sandstones and conglomerate also form prominent strike ridges locally. The Taharoa Fault extends almost parallel with the coast along this Coastal Terrestrial Area. Alluvial soils around rivers/ river flats are prevalent with large parts of the hill country being of early ash deposits.

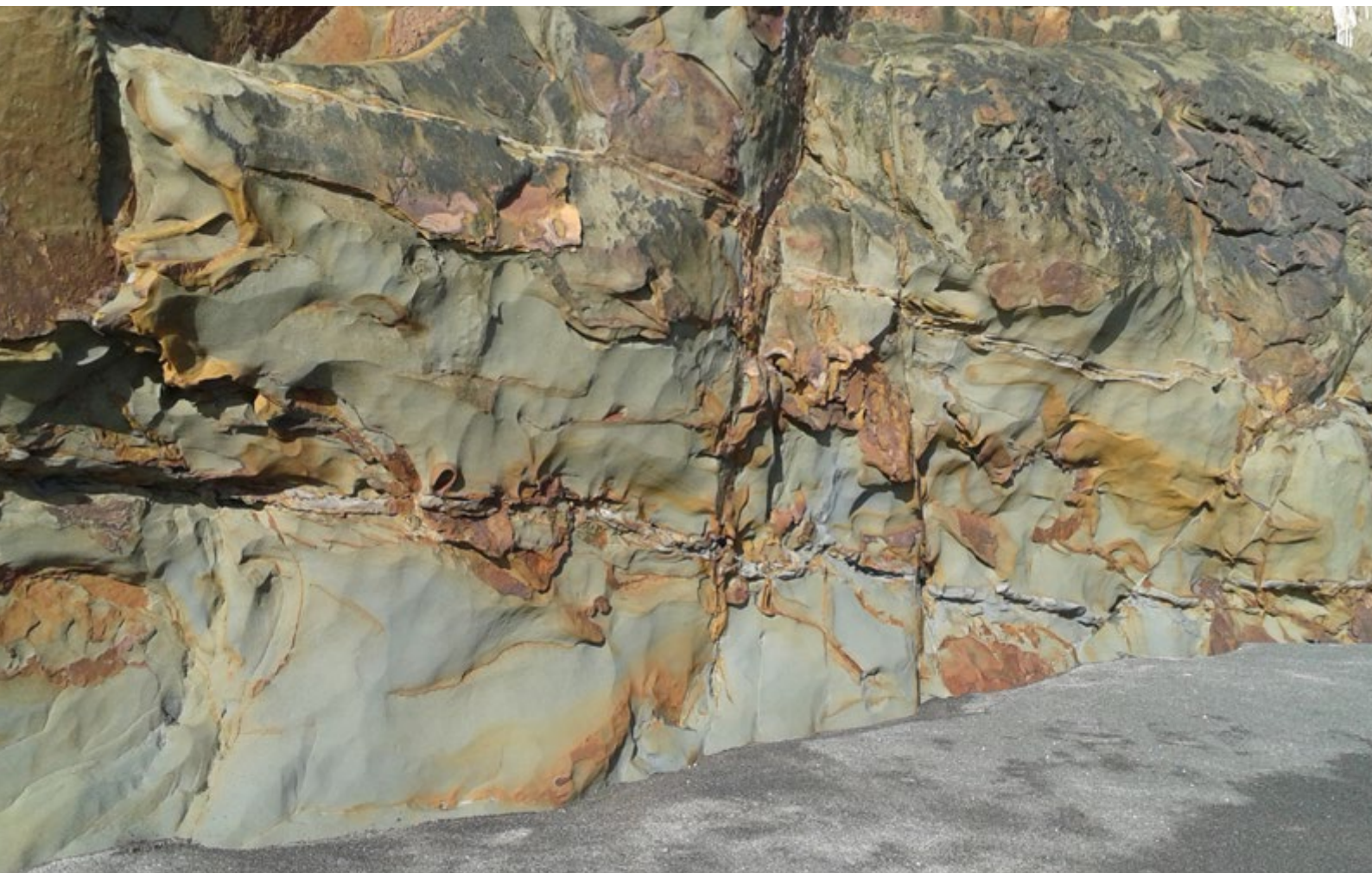
Extensive beach and dune deposits containing titanomagnetite sands (iron sands) are evident along much of the coastline, however a particularly large concentration at Taharoa (greater than 10km² and greater than 50m deep) is evident. Although part of this area is being mined it remains a geopreservation site of regional significance.

Topographically the area is reasonably rugged and undulating. The highest part at Pehimatea rises to 483 metres above sea level, close to Kaitangata Point in the south of this Coastal Terrestrial Area.

South of Marokopa and along the coastline is a sequence of impressive exposed coastal cliffs and platform features of the upper Triassic era. These are of national importance considered the best Triassic sequence in the North Island.

The prevailing weather is westerly, with moist winds, moderate temperatures and ample sunshine.

Below: Coastal erosion of cliffs



The Herangi Range is the dominating topographical feature, falling towards the coast and deeply dissected by the major waterways of Kiritehere Stream and Marokopa River which form broad alluvial flats at the coast. Cliffs form most of the relatively straight coastline, with sand spits and beaches at the mouths of rivers and streams. The most extensive beach is in Nukuhakari Bay; elsewhere beaches are very narrow.

Biotic

Land cover analysis: The total land area of the Marokopa Coastal Terrestrial Area is 4,870ha. Rural production land covers 45% with a further 9% being plantation forestry. Indigenous vegetation forms nearly 33% of the cover, principally comprised of forest and manuka/kanuka scrub, with small areas of wetland and estuarine vegetation. Of the remainder, 9.5% is estuarine open water, lake/pond, and sand/gravel. Gorse/broom and other scrub covers 1.5%, the sand mine covers 1.6%, and there are also very small areas (<1%) of urban area.

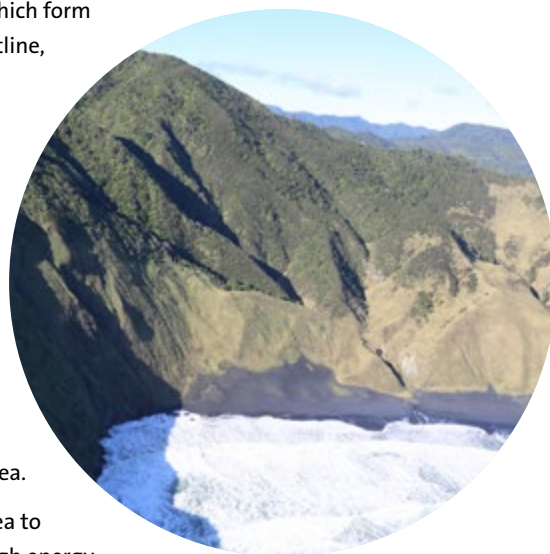
Like much of the west coast and very similar to Awakino Coastal Terrestrial Area to the south, most of Coastal Terrestrial Area has beaches that are narrow and high energy, eroding the steep, high coastal cliffs of sandstone, mudstone and siltstone. The exception is south of Albatross Point, where extensive dunelands extend for a long distance inland and have drowned the Mangatangi Stream. The impounded stream forms Lake Taharoa and several other small dune lakes, with an outlet to the coast north of the Taharoa sand mine via the Wainui Stream. To the south, Lake Harihari has been formed by the same process along with extensive coastal wetlands and small lakes along the coastal margin.

On the stable land, landward of the cliff edge, the entire Coastal Terrestrial Area would originally have been completely covered in mature indigenous coastal forest, with vegetation sheared off by salt spray and wind at the coastal edge. The more dynamic duneland is likely to have been historically vegetated with indigenous coastal forest and scrubland in varying states of succession.

Given the length of this Coastal Terrestrial Area, there are relatively few streams discharging to the coast. Those that do are generally first-order streams, with several second- and third-order perennial streams, and three larger waterways with catchments extending beyond the coastal zone. Typically the larger waterways have wide flat floodplains close to sea level, and the smaller waterways have steeper incised catchments dominated by gullies elevated well above sea level and discharging to the coast via waterfalls. Farm tracks and road culverts may present some barriers to fish passage for the low-elevation catchments, but where streams are not modified by farm drainage system, most offer a relatively natural habitat although waterfalls will preclude access even for climbing species. The streams at lower elevations contribute greater ecological value at the coastline, and Waikato Regional Council identifies the Kaawa Stream coastal dunes, Waikorea Stream wetlands (also incorporating Waimai and Matira Stream habitats) as a key ecological site, but none have legal protection.

Few streams are fenced from livestock and are likely to be affected by the lack of riparian cover and channelisation, and most will be impacted by livestock access, erosion, sedimentation, enrichment, and a lack of suitable instream habitat (e.g. woody debris and aquatic plants). However, the streams flowing through indigenous forest cover and with regenerating shrubland in gullies will have moderate ecological values and the Marokopa River is known for its whitebait fishery. Along the open coastline, the few dunelands or intertidal areas offering food resources or breeding areas for shorebirds are generally associated with stream outlets.

The largest site, Moeatoa Scenic Reserve, is protected and there is one smaller QEII covenant area protecting forest vegetation, but no other vegetation has legal protection or recognition. Moeatoa Scenic Reserve is also home to the threatened plant, *Myosotis petiolata* var. *pansa* and is the southern limit of the *Stipa stipoides* tussockland.



Above: Tapirimoko Coast

Experiential

Despite being remote there is some public presence at Kiritihere and Marokopa south beaches through the use of quads and motorbikes. There is limited public access to Marokopa north head and Taharoa beach and combined with the extensive mining activities in the coastal area there are isolated areas of low perceived naturalness.

Whereas further north and south of Taharoa the coastal dune system is highly expressive of the natural processes and vegetation patterns that occur in an unmodified environment.

The mixture of native vegetation and farmland extending along the coast and the location of pa sites in places, depicts a working landscape that has undergone modification for productive land use. Agricultural farming extends right to the tops of the coastal cliffs both detracting from the natural biotic patterns and emphasising the natural abiotic patterns of the area. Coastal dunes and waterfalls and streams provide a strong sense of naturalness in what is a highly modified coastal edge.

There are a limited number of structures visible from coastline with the coastal cliffs and high energy of the natural processes dominating the coastal experience. The Taharoa Ironsand plant and marine pipeline are visible and recognisable detractors on the naturalness of the area.

Below: Wetland associated with Tauhua Stream



Rating at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High			
Moderate to High		✓	
Moderate	✓		✓
Moderate to Low			
Low			
Very Low			
	Overall Natural Character Rating		Moderate

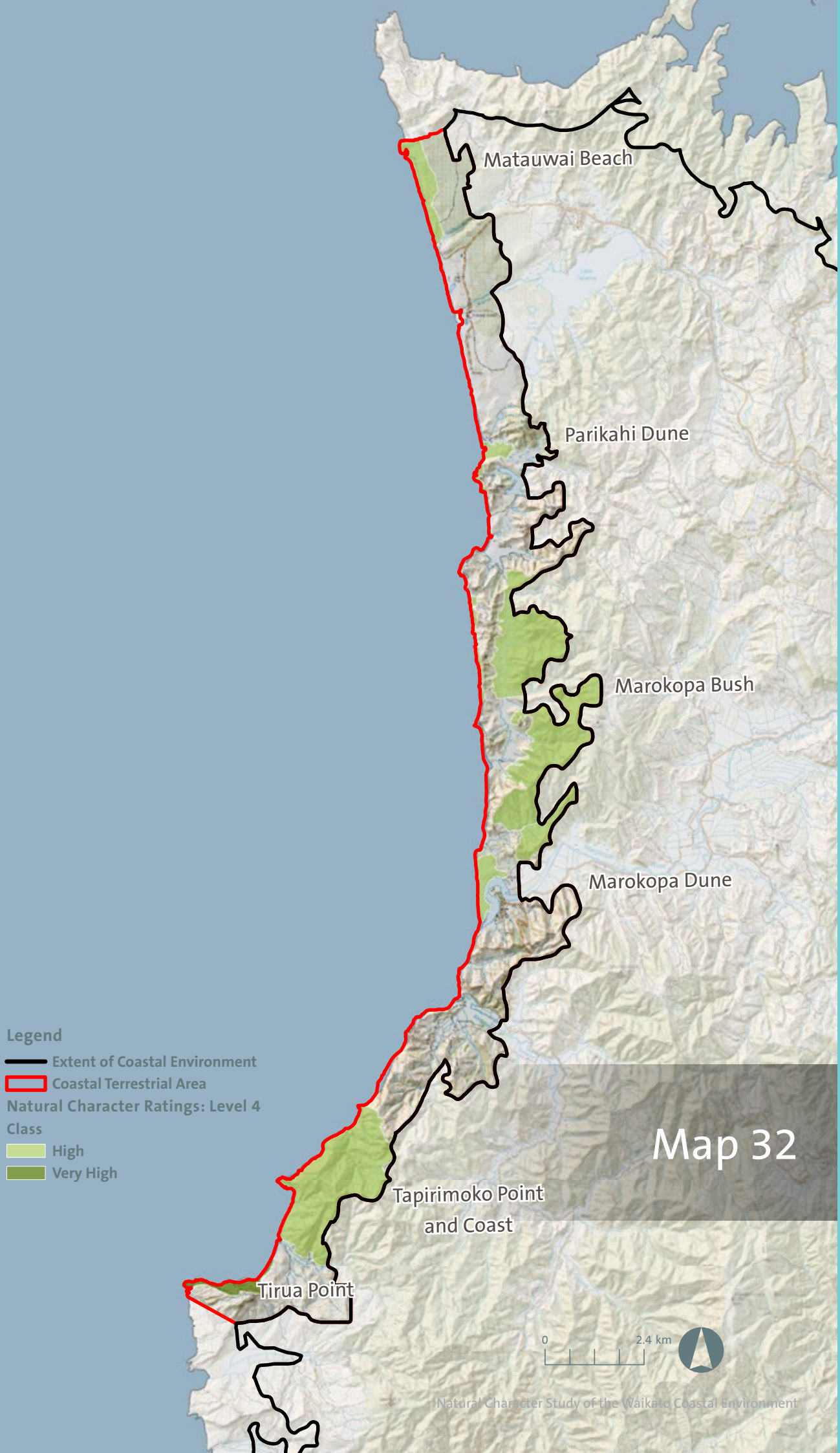
Below: Small settlement of Marokopa



Coastal Terrestrial Area 20: Marokopa Specific Characteristics at Level 4

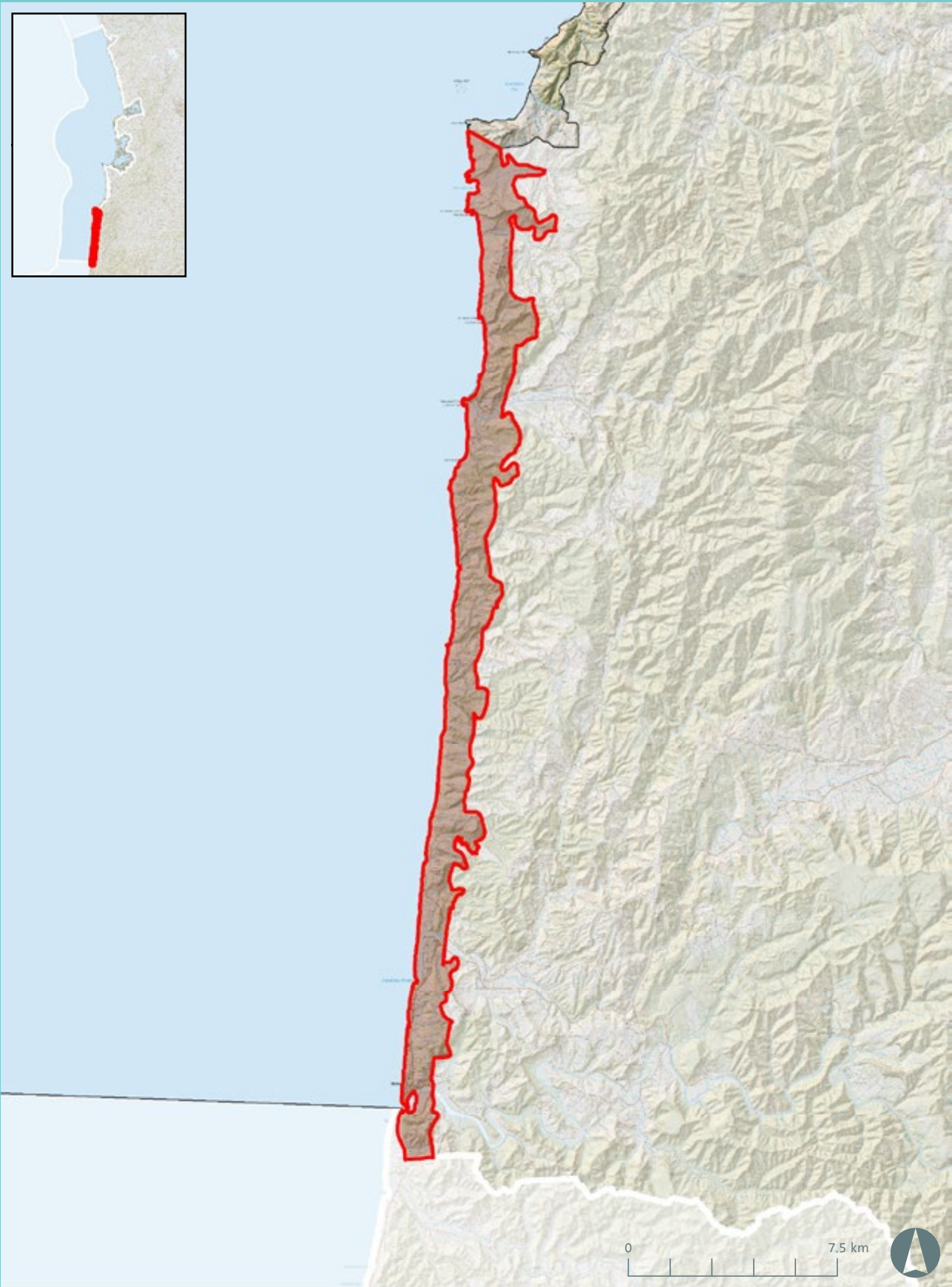
These are mapped with reference to **Map 32**

Area	Rating	Key Values	Additional Comments
Matauwai Beach	High	<ul style="list-style-type: none">Coastal dune sequencing across frontal dune system to upper dune shelves. Dune vegetation and coastal bush vegetation is a good example of coastal vegetation sequencing which is also reflective of the coastal abiotic processes occurring (wind).	<ul style="list-style-type: none">Some modification is apparent from coastal vehicle tracks along the frontal dunes and the placement of coastal baches.
Parikahi Dune	High	<ul style="list-style-type: none">An isolated and unmodified ironsand dune system extending a long way inland, connecting with the stream and coastal lakes. Nestled between two small headlands the area is isolated and very remote, with no public access apparent.	<ul style="list-style-type: none">Modification and activity dominates the coastal edge to the north of the feature with the Taharoa Sand Mine forming an industrial environment.
Marokopa Bush	High	<ul style="list-style-type: none">The backdrop of hill country covered in native bush heightens the sense of remoteness for the area and the adjoining coastal edge.	<ul style="list-style-type: none">Modification is apparent through access and farm tracks.
Marokopa Dune	High	<ul style="list-style-type: none">The Marokopa sand spit comprises unmodified coastal processes along the open coast with influences to its inner edge from adjoining coastal protection measures for Marakopa. Vegetation is representative of coastal dunes.	<ul style="list-style-type: none">Modification is not apparent except for influences incurred from adjoining coastal protection measures within the settlement.
Tapirimoko Point	High	<ul style="list-style-type: none">A striking coast reflective of tectonic and coastal processes with a jagged rocky coast. Coastal vegetation dominates the cliptops connecting to the hinterland of native bush.	<ul style="list-style-type: none">Modification is apparent through pockets of coastal farming along the immediate coastal edge.
Tirua Point	Very High	<ul style="list-style-type: none">Dominant coastal processes interfaced within a highly remote coastal landscape. Vegetation on the eroding slopes remains intact and an example of coastal regeneration.	<ul style="list-style-type: none">Modification occurs at the top of the cliff influencing the natural coastal erosion processes to some extent.



Awakino

COASTAL TERRESTRIAL AREA 21:



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area extends from Tirua Point in the north to the region's southernmost boundary at Mokau. The coastline varies with straight lengths of shoreline and rugged edges in a few places. Land use is predominantly rural agriculture, however there are some significant incised and indigenous-clad gully features that penetrate this undulating farmland. Settlements are far and few between with the principal ones being Mokau and Awakino, which are accessed off State Highway 3. There are a number of large rivers that drain into the ocean, and these include the Awakino River and Mokau River. This Coastal Terrestrial Area is reasonably remote, due to the limited access provided.

Key coastal characteristics include: Relatively straight coastline used primarily for rural grazing; significant incised gullies, vegetated with indigenous bush; two large river mouths (Awakino and Mokau) along with a number of smaller watercourses (i.e. Waikawau River); small settlements, including Awakino and Mokau; limited access and remoteness to the area.

Beyond the coastal environment is the Herangi Range a defining ridge of indigenous clad hills which is the source of the Awakino River. Isolated rural farmsteads are also present west of this area, however some of the smaller watercourses that have eroded the land to create impressive incised vegetated gullies, also dominate these lands, notably north of Awakino.

Below: Grazing land terminates abruptly at the coast below Tirua Point



Abiotic

This Coastal Terrestrial Area is associated with the ancient Jurassic rocks. The Jurassic rocks are principally fossiliferous and siltstone, however sandstones and ocean mudstones also form notable features locally.

Alluvial soils are found principally around rivers/ river flats interspersed with small dunelands with large parts of the hill country being of early ash deposits.

Black magnetite sands dominate the coast providing a contrast to the white sands of the east coast.

Topographically the area is reasonably rugged and undulating. The highest part just north of the Waikawau River reaches 294 metres above sea level.

There are a number of Geopreservation Sites included within this Coastal Terrestrial Area. All are of regional significance. Two relate to the Awakino River mouth, with one representing an extremely well defined example of a river mouth barrier and the remaining one focusing on the exposure of volcanic cliffs.

The Herangi Range is the dominating topographical feature, falling towards the coast and deeply dissected by the major rivers of Waikawau, Manganui/Awakino, and Mokau which form broad alluvial flats at the coast. Cliffs form most of the relatively straight coastline, with sand spits and beaches at the mouths of rivers and streams. The beaches are typically very narrow.

Below: Ancient rocks extend into the sea at Ngararahae Bay



Biotic

Land cover analysis: The total land area of the Awakino Coastal Terrestrial Area is 4,939ha. Rural production land covers 66% with only a small area of plantation forestry (1%). Indigenous vegetation forms nearly 25% of the cover, principally comprised of forest and manuka/kanuka scrub, with small areas of wetland and estuarine vegetation. OF the remainder, sand/gravel covers 4% and river/lake/estuarine open water covers 1.5%. Gorse/broom and other scrub covers 1.2% and there are very small areas (<1%) of urban area.

Like Opura and Marokopa Coastal Terrestrial Areas, the Awakino CTA beaches are narrow and high energy, actively eroding the high, steep sedimentary rock coastal cliffs. However, beyond the cliffs the underlying rock strata are from older more stable land units. On this stable land, the entire Coastal Terrestrial Area would originally have been completely covered in mature indigenous coastal and lowland forest, with vegetation sheared off by salt spray and wind at the coastal edge.

Today, indigenous coastal vegetation is relatively limited and typically found only on the narrow coastal cliffs and in the isolated large patches of regenerating forest. However, most forest cover is some distance from the coast, and none provide a complete vegetation sequence from coastal dune/herb vegetation to lowland forest. Where land is reverting, manuka/kanuka is providing a nursery crop and regeneration is beginning to occur but the areas are small. In spite of the 25% indigenous vegetation cover, Waikato Regional Council identifies no key ecological sites in the Coastal Terrestrial Area. However, a number of the larger forest patches are protected in reserves and there are several smaller stewardship areas protecting riparian vegetation. The Coastal Terrestrial Area is also home to the northernmost examples of coastal turfs on the West Coast and good populations of the forget-me-not, *Myosotis petiolata* var *pansa*.

The streams discharging to the coast are generally first- or second-order perennial streams, and eight are larger waterways with catchments extending beyond the coastal zone. Typically the larger waterways have wide flat floodplains close to sea level, and the smaller waterways have steeper incised catchments dominated by gullies elevated well above sea level and discharging to the coast via waterfalls. Farm tracks and road culverts may present some barriers to fish passage for the low-elevation catchments, but where streams are not modified by farm drainage system, most offer a relatively natural habitat although waterfalls will preclude access even for climbing species. The streams at lower elevations contribute greater ecological value at the coastline,

The low elevation streams are likely to be affected by the lack of riparian cover and channelisation, and all streams will be impacted by livestock access, erosion, sedimentation, enrichment, and a lack of suitable instream habitat (e.g. woody debris and aquatic plants). However, many of the higher elevation streams benefit from indigenous forest cover, particularly in gullies where regeneration is occurring, and ecological values will be moderate. The Waikawau and Awakino Rivers are known for their whitebait fisheries. Along the open coastline, the few dunelands or intertidal areas offering limited food resources or breeding areas for shorebirds are generally associated with stream outlets.



Right: Typical sedimentary coastal cliff herbaceous plant community - sand tussock, flax, ice plant, sea primrose, wharanui

Experiential

There is very limited public access to the coastline outside of the settlement of Mokau resulting in a relatively isolated coastal experience. However farming and access tracks are more frequent along this extent of coast with numerous farm dwellings scattered along the coastal edge. Despite this the coastline is relatively free of artificial light and the natural darkness of the sky unaltered, outside of the settlement areas.

Modification to the upper terraces and clifftops of the shoreline is apparent from agricultural land use. The remaining natural dune and coastal bush areas display the highest degree of perceived naturalness due the lack of modification from productive land use and structures. Like the rest of the west coast the high energy coastal processes dominate the experience of the natural processes.

Areas where native bush cover extends along and to the coastline accentuate the recognition of the broader coastal patterns. Frequent waterfalls are scattered along the coastline and are indicative of the geomorphology and tectonic processes of the area. The vegetated escarpments with the narrow sandy beach provide isolated experiences of remoteness and intactness.

However on the whole this Coastal Terrestrial Area is modified and whilst the natural processes continue to dominate the experiences , the naturalness of the biotic and abiotic systems are lessened as a result of modification.

Below: Opito Point and the forested slopes of Huikomako



Rating at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High			
Moderate to High		✓	
Moderate	✓		✓
Moderate to Low			
Low			
Very Low			
Overall Natural Character Rating			Moderate

Below: The small southern township of Mokau and the Mokau River mouth.

Right: Hand dug pedestrian tunnel from Waikawau Rd to Waikawau Beach.



Coastal Terrestrial Area 21: Awakino Specific Characteristics at Level 4

These are mapped with reference to **Map 33**

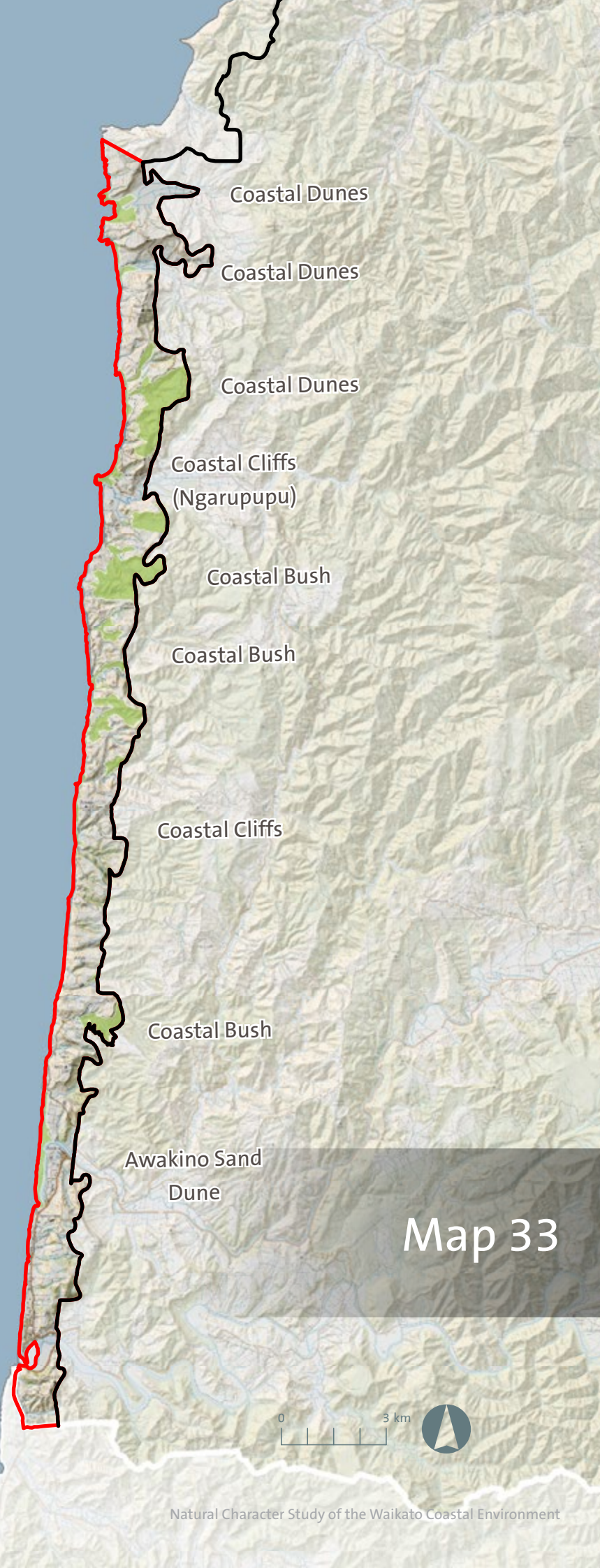
Area	Rating	Key Values	Additional Comments
Coastal Dunes	High	<ul style="list-style-type: none">Several dune systems extend inland along valley floors creating a sequence of unmodified natural patterns, including clifftop dune sheets. Biotic patterns are dominated by coastal dune species.	<ul style="list-style-type: none">The natural edges to the dune system are modified through adjoining agricultural land use.
Coastal Cliffs	High	<ul style="list-style-type: none">A narrow margin of striking coastal cliffs subjected to dominant coastal eroision and natural coastal forces. A number of waterfalls extend down the cliff faces which are evident of tectonic processes.	<ul style="list-style-type: none">Atop the coastal cliffs farming dominates the land use along with access tracks. Gully systems where farming land use is abandoned or inaccessible are dominated by native vegetation cover. A highly remote area with no public access possible.
Coastal Bush	High	<ul style="list-style-type: none">The hill country is steep and reflective of the native tectonic and erosion processes occuring. Native vegetation is comprehensive and intact.	<ul style="list-style-type: none">Remote, with the margins managed by the adjoining agricultural land use.
Awakino Sand Dune	High	<ul style="list-style-type: none">The Marokopa sand spit comprises unmodified coastal processes along its southern edge with modification at the northern end.	<ul style="list-style-type: none">A small but important feature for the coastal dune system with modification apparent along is northern margins.

Below: Waikawau Beach and waterfall



Legend

- Extent of Coastal Environment
- Coastal Terrestrial Area
- Natural Character Ratings: Level 4 Class
 - High
 - Very High



Map 33

Overall Evaluation – Level 4

At the more specific Level 4 scale, individual bays, estuaries, harbours, headlands and islands have been mapped to illustrate those areas holding high or very high levels of natural character. This more detailed mapping has only been undertaken where specific mention or detail has been included about a smaller area within the broader ‘Area’ of Level 3 descriptions and evaluations.

Within some of the least modified areas, the extent of the high and very high mapped areas has been more straight forward. For example, Southern Kawhia bush areas retains mature indigenous bush which has largely avoided the impact of humans. The harbour and coastal margin of this area also retains high levels of naturalness, again due predominantly to the lack of human change and the resultant high ecological habitats. All of the areas that are mapped as high or very high natural character within the 10 different Level 3 ‘Areas’, at the Level 4 scale, are shown collectively on the map opposite.

Refer to Section E of this study for the separate mapping of the Outstanding Natural Character Areas, which used this Level 4 mapping as a basis for further consideration.

*Below: Northern shoreline
of Whaingaroa Harbour*

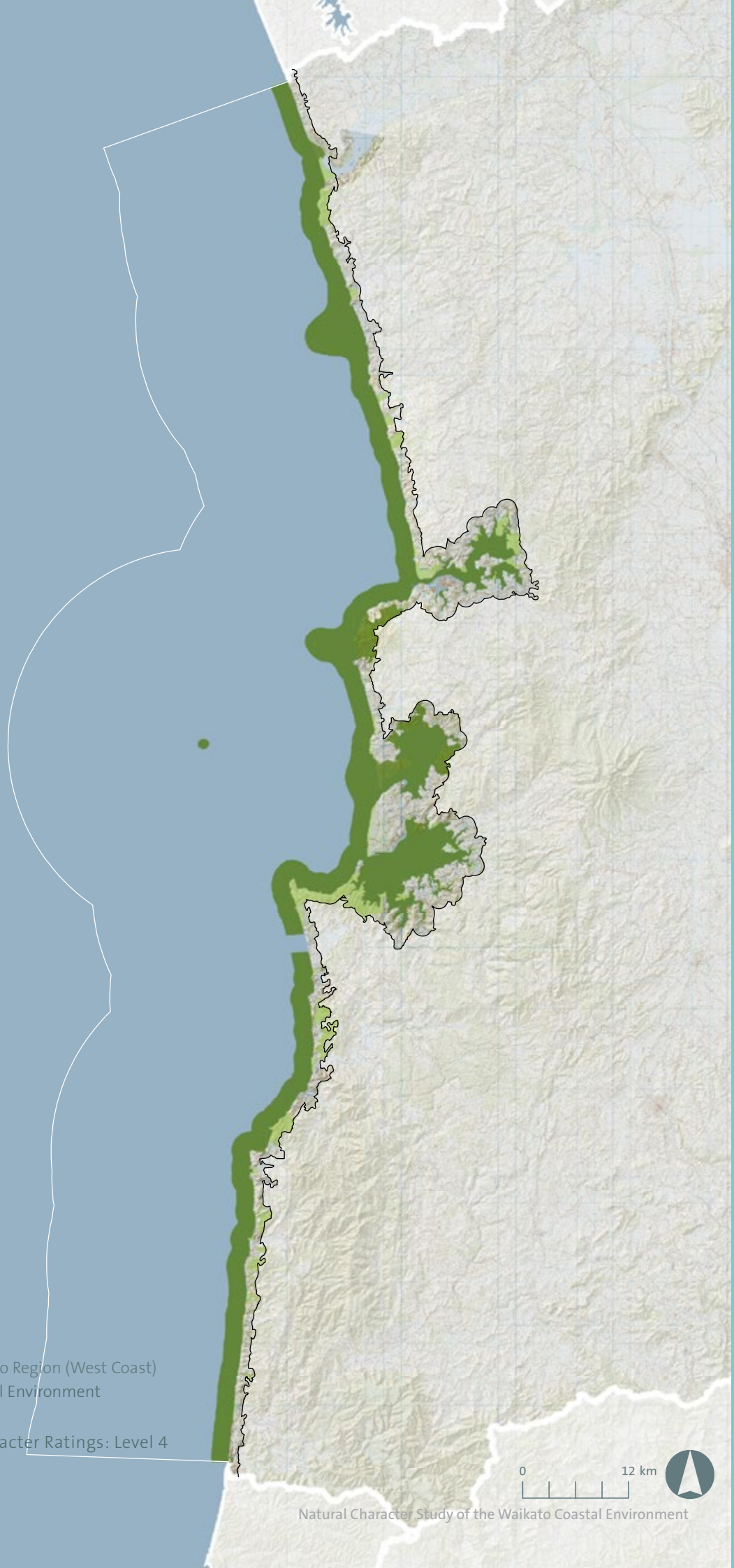


Legend

- Extent of Waikato Region (West Coast)
- Extent of Coastal Environment

Waikato West Coast
Coastal Natural Character Ratings: Level 4

- High
- Very High





Above: Elephant Cove, Motukawao Island Group
Natural Character Study of the Waikato Coastal Environment