Wainui Beach Erosion Management Strategy

August 2014

GISBORNE DISTRICT COUNCIL

Acknowledgements

Council acknowledges the members of the Key Stakeholder Forum and Working Group, for the time they have given to the Strategy development.

Executive Summary

This document sets out Gisborne District Council's strategy for managing coastal erosion at Wainui Beach. The Strategy is intended to sit within a broader vision of integrated management of Wainui Beach that conserves and enhances the environment for future generations.

The Strategy was developed through a stakeholder engagement process and is supported by a forum of key stakeholders, formed by the Council, to bring together multiple stakeholder perspectives and work through issues. It is also informed by the advice of Tonkin and Taylor, Eco Nomos and eco-i. Tonkin and Taylor and Eco Nomos were commissioned to provide detailed advice on erosion management options.

The shoreline of Wainui Beach is dynamic with rapid erosion events during storms followed by slow rebuilding of the dunes (accretion). Decadal climate cycles, including the Interdecadal Pacific Oscillation, influence the severity and frequency of storms, resulting in decadal cycles of erosion and accretion. In addition, climate change may increase the severity of storms and therefore enhance the frequency and severity of erosion events. The impacts of sea level rise due to climate change on the position of the shoreline may not be realised for several decades, but ultimately sea level rise is expected to cause shoreline retreat.

Erosion at Wainui Beach is primarily seen as a risk for property rather than human safety. Over 100 private properties are located adjacent to the beach south of Hamanatua Stream. Twenty eight of these properties have dwellings within the coastal hazard zone 'Extreme Risk Area' identified in Councils plans. This means these dwellings have been identified as potentially at risk from erosion resulting from one storm. In the northern part of the beach private properties are set back from the beach but the Wainui Surf Club and reserve carparks could be threatened by erosion.

Broad goals and principles were developed with the Key Stakeholder Forum to guide the identification of erosion management options. These aim to protect the wide values of Wainui Beach recognised by the stakeholders, including its iconic surf breaks, natural ecology, recreational values and cultural values, and manage these in an integrated and holistic way.

Development of the Strategy was also guided by the Resource Management Act 1991 and the New Zealand Coastal Policy Statement. Notably, the latter identifies "Wainui-Stock Route – Pines – Whales" in the list of surf breaks of national significance. The New Zealand Coastal Policy Statement also requires a focus on management approaches that reduce or avoid the risk through locating development away from harm and it discourages hard protection works.

The options promoted in this strategy for the short term (next ten or twenty years) focus on managing the risk associated with existing sea level and coastal processes. In essence, this involves Council:

- refining development controls in Councils resource management plans to better avoid and reduce the risk presented by development in the area prone to coastal erosion.
- promoting the restoration of dunes through planting
- responding to erosion events that threaten dwellings by pushing-up of sand to reform dunes
- constructing a new rock revetment north of the concrete groyne
- maintaining structures around the streams
- retaining other existing structures subject to removal of features that present safety concerns e.g. rusted iron, etc.

For the medium term (20-30 years) to longer term (next 100 years) the strategy identifies further actions that may be required in response to aggravated erosion due to projected sea level rise and other climate change factors. Trigger points (e.g. expiration of resource consents) for consideration or implementation of alternative management approaches are described.

Contents

1 Introduction

This document sets out a strategy for managing coastal erosion at Wainui Beach. The Strategy replaces the previous Wainui Beach Management Strategy adopted in 2003 (WBMS 2003), which also focused on the management of coastal erosion.

The Strategy is a Gisborne District Council strategy, adopted on the recommendation of a group of stakeholders formed by the Council to assist with development of the strategy (the Key Stakeholder Forum). The Strategy is also informed by the advice of Tonkin & Taylor, Eco Nomos and eco-i. Tonkin & Taylor and Eco Nomos were commissioned to provide detailed advice on the management options for different parts of the beach, as set out in their report 'Wainui Beach Management Strategy' (2014).

2 Purpose and Vision

The purpose of the Strategy, which was confirmed by the Key Stakeholder Forum, has been categorised into sustainability, broader context and broad acceptance themes as follows:

Strategy Purpose	
Sustainability	To develop a sustainable strategy that identifies the preferred management of coastal erosion hazards affecting Wainui Beach.
Broader Context	We will be taking into consideration the wider economic, environmental, social, recreational and cultural context.
Broad Acceptance	Our goal is to achieve a strategy that has broad acceptance amongst the community because it will provide a framework for future development and decisions related to Wainui Beach.

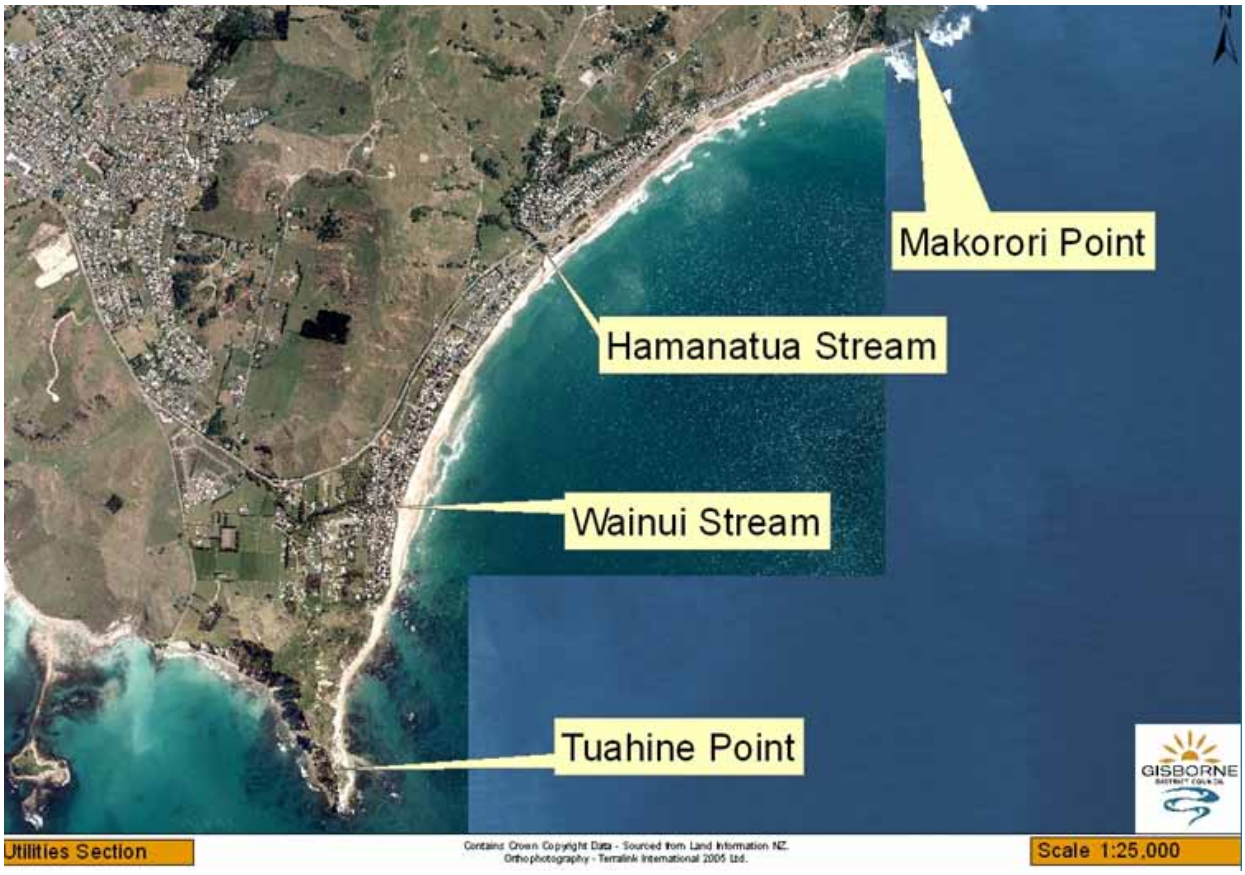
While focusing on the management of coastal erosion, the Strategy is intended to sit within a broader vision, principles, and goals for the management of the beach promoted by the Key Stakeholder Forum. These are:

Vision	Integrated management of Wainui Beach that conserves and enhances the environment for current and future generations.
Broad Goals	▸ Retain beach access (public and private) ▸ Protect property (public and private) ▸ Conserve and enhance the natural environment
Key Principles	▸ Evidence based approach ▸ Management strategy supported and relevant over longer term ▸ Natural ecology of beach sustained ▸ Needs of beach users and beachfront property owners balanced ▸ Integrated and holistic approach recognising different issues along beach ▸ Affordability of management strategies for current and future generations ▸ Iconic surf breaks protected ▸ Community and tangata whenua values reflected ▸ Broad community acceptance

3 Context

3.1 Study area

The study area for the Strategy is Wainui Beach, which is located on the outskirts of Gisborne City. Wainui Beach extends about 6km between Tuahine Point to the south and Makorori Point to the north. It has an approximate northeast-southwest alignment to the Pacific Ocean. The beach consists of a predominantly sandy shoreline, backed by a substantial dune system between the two rocky headlands. Two streams flow out onto Wainui Beach; Wainui Stream to the south, and Hamanatua Stream in the middle.



3.2 Erosion at Wainui Beach

Erosion processes at Wainui Beach are complex and a wide volume of research relates to these processes. The discussion document prepared for the development of the Strategy (GDC, 2013) provides a detailed summary of the existing information, which is not replicated in this strategy.

Based on historic trends, it is expected that future erosion processes at Wainui Beach will continue to be dominated by storms and rip currents. This results in a dynamic shoreline with rapid erosion events followed by slow rebuilding of the dunes (accretion). Climate change may increase the severity of storms and result in an even more dynamic shoreline.

Sea level rise due to climate change is expected to cause shoreline retreat but this may not be experienced for several decades to come.

Multi-decadal climatic and lunar cycles (including the Interdecadal Pacific Oscillation or IPO) will also continue to impact on the severity and frequency of storms, resulting in cycles of erosion and accretion.

Some experts also suggest erosion of the headland at Tuahine Point and offshore reef could cause an increase in wave energy from the south, resulting in a redistribution of sand from the south to the north of the beach.

Gisborne District Council applies hazard zones to show varying levels of the erosion hazard along Wainui Beach. These were developed by Gibb in 2001 (Gibb, 2001) and are due for review. The review may result in changes to the extent and locations of the hazard zones, but is considered unlikely to affect the implementation of the options identified in the strategy.

Erosion at Wainui Beach is primarily seen as a risk for property rather than human safety.

One hundred and thirteen beachfront properties south of Hamanatua Stream are within the coastal hazard zones mapped in the District and Coastal Plan. These properties have a total capital rating value (based on 2011 valuations) of $102 million. Nearly three-quarters of the capital value is attributed to land value.

Of these 113 properties, 28 have dwellings substantially within the Extreme Hazard Zone, which is intended to show the area that is, or is likely to be, subject to adverse effects from short-term duneline fluctuations and storm cuts. This area has a high probability of being adversely affected at any point in time, but more particularly during negative IPO phases.

North of the Hamanatua Stream private properties are located well back from the beach, so it is only the reserve that is likely to be affected. The most important asset in this reserve is the Wainui Surf Club, which is located in the Extreme and High Hazard Zones.

3.3 Statutory and policy considerations

The Resource Management Act 1991 (RMA) and the policies and plans written under this Act (particularly the New Zealand Coastal Policy Statement 2010) were critical to the development of the Strategy. Detailed information about the statutory and policy framework is provided in the background and discussion document (GDC, 2013).

In summary, the RMA and related documents require a focus on management approaches that reduce or avoid the risk through locating development away from harm; hard protection structures are discouraged. The RMA and related documents also contain a range of objectives and policies to guide the development of the strategy, including those relating to natural character of the coastal environment; Maori cultural values and participation of Maori in decision making; and surf breaks of national significance. Importantly, Wainui-Stock Route – Pines – Whales, is included in the list of surf breaks of national significance.

4 Development of the Strategy

This Strategy was developed through a stakeholder engagement process.

Engagement was initiated with a stakeholder survey and meeting on 22 August 2012 to introduce the project, proposed process, project scope and agree on the engagement and communication process. The meeting was open to the public and advertised widely. Potential stakeholders were also sent personal invites to promote their attendance.

The Council also organised a public meeting at the beginning of the project to educate those interested on the coastal processes at Wainui Beach. Coastal engineer Richard Reinen-Hamill (Tonkin & Taylor) and coastal scientist Dr. Amber Dunn (eco-i) presented at this meeting.

The public meeting on 22 August 2012 resulted in the formation of a Key Stakeholder Forum to bring together multiple stakeholder perspectives and work through issues. The Forum ultimately provided recommendations to Council on the content of this strategy.

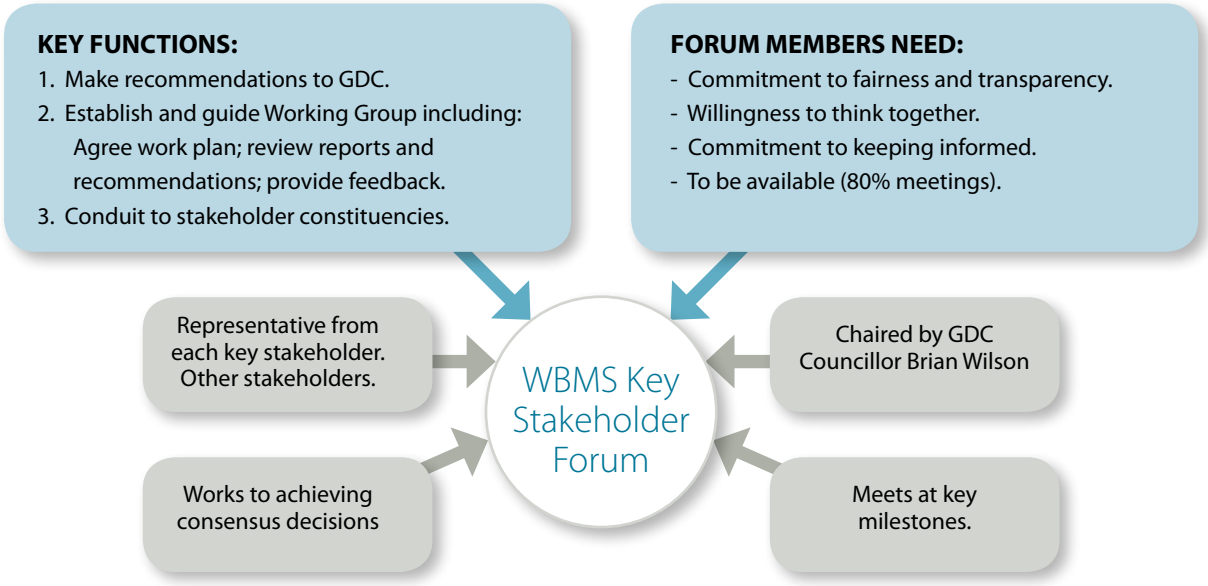


Figure 2 – Key Stakeholder Forum

A Working Group was also formed at the public meeting on 22 August 2012. Its role was to work through the important and substantive issues in depth and to provide recommendations back to the Key Stakeholder Forum. The Working Group was particularly important at the beginning of the project when the issues and information were explored.

The terms of reference and membership of the Key Stakeholder Forum and Working Group are included in Appendix 2.

A public meeting was held in December 2012 to provide an update on progress.

A background and discussion document was developed by Council staff in July 2013 (GDC, 2013). The majority of the document was dedicated to collating information about the erosion risk at Wainui and the policy and issues relevant to its management, in order to prepare stakeholders for detailed discussion and consideration of issues. In the last part of the document possible high level options were identified, which were used as a basis for a survey and further discussion with Key Stakeholder Forum members.

Tonkin and Taylor and Eco Nomos were then commissioned, on the advice of the Key Stakeholder Forum, to jointly provide detailed management recommendations for the different parts of the beach (Tonkin and Taylor and Economos, 2014). Their recommendations were supported by the Key Stakeholder Forum and provide the basis for this strategy.

The draft strategy was presented to the Key Stakeholder Forum on 21 May 2014 [insert further detail after meeting].

Council's website also provided opportunity for the community outside of the Key Stakeholder Forum to be informed. Meeting minutes, presentations, the discussion document and reports were all available through the website.

A further public meeting was held on 28 May 2014 to provide information about the Strategy development process and the Key Stakeholder Forum's recommendations.

[Insert further detail about Council's subsequent consideration of the Key Stakeholder Forum's recommendations and adoption of the strategy].

5 Philosophy Underlying the Strategy

The philosophy underlying this Strategy is a hierarchy of management options for addressing coastal erosion, with an emphasis on risk avoidance and risk reduction, as set out below.

Recognition of this hierarchy is intended to provide consistency with the RMA, the New Zealand Coastal Policy Statement, as well as good practice in Risk Management.

i. Risk avoidance – Managing land use in hazard risk areas to avoid the creation of new risk or the exacerbation of existing risk.

Such measures would likely preclude any further subdivision within all hazard zone areas – unless all properties created have sufficient room for future relocation of dwellings landward of the hazard zones. Historic subdivision at Wainui Beach has often significantly reduced the resilience of the more seaward properties created. Similar subdivision within any of the defined hazard zones should be precluded in the future.

ii. Risk reduction – Managing land use and development to reduce existing risk exposure over time.

This typically involves control to preclude any renovation that significantly increases the existing building envelope or placement of new dwellings within the area judged to be at risk over the next 50 years – the High Risk Zone identified by Gibb at Wainui. Where practical, this ensures that risk is reduced over time by houses being more safely located further landward. Where safe relocation is not practical, increased risk is avoided by not increasing the value of the asset.

Development in areas that are identified as safe for the next 50 years, but could potentially be impacted over the next 100 years (i.e. the Moderate Risk Zone identified by Gibb at Wainui), will need to recognise and provide for the longer term risk (e.g. notices on titles accompanying any consented works; requirement for practical relocatability). The GDC (2013) report discusses in more detail the various controls that could be applied.

The emphasis on risk avoidance and risk reduction clearly place restrictions on changes in use of private property. In some cases at Wainui (e.g. where the High Risk Zone covers much of the property), imposition of the development controls based on existing setbacks could restrict the potential to increase the existing building envelope or otherwise substantially redevelop existing private properties.

Opportunity and guidance could also be provided to property owners to identify additional investigations that could further refine the hazard zoning on their property, particularly with regard to ground conditions and levels which may affect assumptions of erosion or inundation.

Where development controls alone are unable to provide for avoidance of risk, strategies that require additional measures, such as those discussed further below, should be considered.

iii. Mitigation of erosion through protection and restoration of natural buffers

Natural buffers include beaches and dunes. Protection and restoration of these features is promoted, including planting, shaping, and the use of measures such as sand push-up to assist dune repair where appropriate.

This work is relevant in most areas of Wainui Beach – except where a high tide beach does not normally occur and the beach is backed by rock banks (e.g. Areas 1 and 2 [see Appendix 1]).

There are other areas where permanent sand dunes are not part of the natural system (e.g. in most of Area 3, the beach is backed by a bluff composed of old estuarine sediments rather than a dune composed of loose sands). However, in these situations restoration of native sand trapping vegetation can still be useful to facilitate natural repair following erosion.

Sand push ups (often also called beach scraping) can be a useful and appropriate approach to facilitate dune repair after erosion or to assist with restoration of dunes. This action mimics natural repair processes by transferring sand from the beach to the dune. Guidelines are required for this work to be effective (and to also avoid unnecessary or excessive use of the approach). Usually, a generic consent is sought for the activity with conditions to ensure it is only used when appropriate.

iv. Soft engineering measures which mitigate erosion using natural buffers.

Soft engineering measures could include stream training walls that do not significantly impact on beach processes and that help maintain wider natural buffers (beach and/or dunes) than would otherwise occur. Where such measures could play a useful, cost-effective and appropriate role they have they are identified.

v. Living with erosion – accepting erosion where appropriate.

This approach is practical along those lengths of Wainui Beach where both the following conditions are met - only land is at risk and dwellings are unlikely to be threatened. A trigger should be included to ensure other intervention occurs if dwellings are at risk (i.e. if erosion exceeds the specified trigger level). This intervention could be as simple as a beach push-up to restore an adequate width of natural buffer to manage a specific localised event, although other treatments, such as relocation or removal of dwellings might need to be considered where push ups are not appropriate or considered inadequate.

vi. Landward relocation of assets to a safe location.

This specifically means the relocation of at-risk dwellings further landward on the same property or landward relocation of public infrastructure (e.g. car parking areas).

There are locations along Wainui Beach where dwellings could be located further landward on property to reduce their exposure to coastal erosion. However, over at least the short term (i.e. next 10-20 years) this work can be left until the owners decide to replace or carry out major renovations that increase the existing building envelope, particularly with regard to any seaward extension – at which stage the development controls should ensure a more safe location. However, areas where existing houses are close to the top landward edge of historic erosion scarps are clearly at higher risk in the event that a major storm occurs. Careful thought should be given to early relocation of these dwellings. Relocation of dwellings in other circumstances will probably only be required over the longer term (e.g. if permanent shoreline retreat occurs in response to projected sea level rise).

vii. "Hard" engineering structures, including new or existing sea walls or rock revetments.

Robust, well-engineered structures are designed to provide protection to land areas for a particular design event and at Wainui Beach this would typically require large sloping rock revetments which tend to be expensive and encroach over the foreshore, often aggravating adverse effects. There would be ongoing costs associated with maintenance and upgrade of the structures to cope with future climate change induced effects.

Hard protection structures that provide protection to land are generally not suited as long term solutions on high natural and amenity value open coast beaches such as Wainui - because of adverse effects on values such as natural character, visual/landscape values, recreational beach use, public access and (potentially) surf breaks. Climate change and the associated increase in sea level rise would exacerbate these impacts.

However, historically at Wainui, there has been widespread use of relatively modest structures which, with ongoing maintenance or upgrades have often played a useful role in mitigating erosion – sometimes with only minor adverse effects on coastal values as they are buried for prolonged periods. These structures are not suitable as long term solutions because of their engineering deficiencies and the wider matters noted above. However, in the short-medium term some do perform a useful function.

In regards to existing hard structures, the following approaches are promoted:

- Leave existing structures which are judged to be performing a useful role and which have only minimal or infrequent adverse effects on beach use and values; with triggers proposed to ensure each structure is removed if this situation changes (i.e. if significant adverse effects occur). Additional actions are also promoted (sand pushups, etc) to help mitigate adverse effects and extend the life of the structures despite the engineering deficiencies.
- Leave for the meantime structures which may not be serving a particularly useful role (other perhaps than psychological) but which are relatively innocuous and are not having significant adverse effects. Short term actions required to mitigate adverse effects are identified as priority actions.
- Retain existing structures which have significant adverse effects on beach values but are currently consented. The issues relevant to such structures are highlighted and those that may have to be removed in the longer term future when consents expire are indicated. Therefore, no long term reliance should be placed on such structures.
- Avoid new structures, except where they are considered critical for the short-to-medium term management of erosion. Identify triggers and other measures to ensure long term reliance on the structures are avoided and they can eventually be removed.
- It is important to appreciate that there are no existing structures anywhere on Wainui Beach that are likely to be suitable long term solutions if the shoreline undergoes significant permanent retreat in response to projected sea level rise – because of adverse effects and/or engineering limitations. Where structures are critical to ongoing use of properties (i.e. where properties would otherwise have to abandoned) actions that may be needed over time to reduce the impact of the structure (eg retreat of the structure) are identified.

6 Management Areas

For the purposes of management, the study area has been divided into eight sub-areas based generally on geology, coastal processes and erosion hazard. Extents are shown on Figure A1 and A2, included in Appendix 1.

The following sections describe and assess management requirements in each of these areas and identify the preferred strategy for each one. This is taken directly from the recommendations of Tonkin & Taylor and Ero Nomos.

6.1 Area 1 – Tuahine Point

6.1.1 Description

This area extends from the southern tip of Tuahine Point to the southern end of the existing rock revetment. The area comprises of active steep sea cliffs formed by ongoing toe erosion and associated upslope instability. In addition to shallow slope failures and rock fall associated with the active cliff margin, deep seated landslides also occur - with some of these visible features extending up to at least 120-130m inland. The width of the shoreline potentially vulnerable to these landslides is not clear, and may or may not be incorporated within the defined coastal erosion hazard zones.

An ephemeral perched beach of varying width and length periodically occurs associated with sand transfers backwards and forwards between this area and the wider Wainui Beach sand system. A permanent dry sandy beach and dunes are not part of the natural character of this area.

There is no development or infrastructure within the hazard risk areas as presently defined, the land being active cliffs backed by scrubland and, further landward, steep farmland. The area is zoned rural residential.

6.1.2 Options discussion

Risk avoidance is the only hazard management option favoured in this area. This option is required, not only to avoid the creation of hazard issues, but also to preserve the existing high natural character. The degradation of natural character within Area 2 as a result of hard protection works (see discussion below) indicates the problems that can otherwise arise.

There would be benefits in moving from grazing farmland to a more densely vegetated/forested ecosystem along the coastal margin to reduce the landslide hazard. Aerial photographs suggest that useful progress has already been achieved in this respect with much of the steeper margin behind the cliffs now fenced off and in partial scrub cover.

6.1.3 Strategy for Area 1

Planning and development controls to avoid future location of subdivision or dwellings within hazard risk areas.

6.1.4 Triggers

Any future proposal for a dwelling or residential development on the seaward side of the ridgelines should trigger consideration of landslide hazard and appropriate action to mitigate this risk (e.g. consideration of change from pastoral to forested land uses).

6.2 Area 2 – Tuahine Crescent

6.2.1 Description

This area, approximately 175m long, includes the existing rock wall and groyne and extends northwards to include the public beach access way from Tuahine Crescent.

In terms of coastal geomorphology, the area is similar to Area one 1 – with eroding cliffs fronted by rock reefs and only occasional occurrence of a sandy beach. Aerial photography pre-dating the placement of erosion protection works indicates steeply sloping active cliffs in southern and central parts of the area (Figure 3) with evidence of wave undercutting at the base of the cliff. Deeper seated slumping is evident at the northern end (Figure 3).

Figure 3 View of Area 2 (and northern part of Area 1) in December 1955 showing the natural character and erosion/landslide mechanisms in this area prior to placement of erosion protection works. Note: Double-headed arrow shows approximate longshore extent of Area 2 (Source – Alexander Turnbull Library in Tonkin and Taylor and Eco Nomos, 2013)

Geotechnical investigation has been carried out (LDE, 2014) to assist in understanding the geology of the backshore area in Area 2. This involved four electronic cone penetrometer tests (CPT) along a transect of Tuahine Crescent beach access way. The results showed a complex sequence of dense sands banded by softer clays situated in the backshore areas, although at the coast (CPT 103) the bluff material comprised softer fine grained silts and sands. This suggests an erodible bluff.

The major difference from Area 1 is that there are private properties at the top edge of the eroding cliffs. A significant portion of these properties lies within the extreme and high hazard zones as presently defined. It is also clear from historic aerial photography that the slump failure evident at the northern end in the mid 1950's posed a hazard to houses in this area at that time (Figure 3).

Erosion in the late 1950's and early 1960's led to the placement of early erosion protection of the cliff areas along much of Area 2 and these works have been progressively upgraded and replaced over time. A rock revetment (Figure 4) has recently (2007) replaced earlier works along most of Area 2 except for the northern end where early protection works (railway irons and log wall with rocks placed behind) remain (Figure 4). The recently constructed rock revetment south of the groyne is consented until 2042. The revetment is largely constructed within a narrow amenity reserve, extending into private land at locations.

6.2.2 Options discussion

Management of development is critical in Area 2 as the existing hazard zones suggest extreme risk to many existing dwellings. The controls will prevent exacerbation of this existing risk and reduce the risk profile over time.

With the present hazard zones, application of the development controls promoted (see Section 5 above) would limit most building extensions that extend the dwelling beyond the existing building envelope as well as preventing new building and subdivision.

Useful mitigation of hazard risk through protection and restoration of natural buffers such as beaches and dunes is not relevant or practical in this area as dunes are not part of the natural character. Similarly, there are presently no cost-effective or appropriate options for soft engineering in this area. The use of a dynamic cobble beach was considered but overall the adverse effects of such a structure on beach values would probably be similar or more severe than a rock revetment.

The recent revetment is consented and it is unlikely that affected land owners would consider removal within the consent period given the hazard risk areas as presently identified. Accordingly, the option of living with erosion is unlikely to be practical over much of the length in the near future.

The existing hard structures provide backshore erosion protection for a particular design event over a period of time and can only be consented for a period of 35 years. However, if development continues within areas susceptible to coastal hazards landward the overall risk from that hazard increases. These limitations preclude their adoption as long term solution. In addition they have adverse environmental effects which need to be carefully considered.

In terms of engineering limitations, the recently constructed revetment has wave washed wooden debris at the top of the structure (Figure 4) indicating periodic overtopping and there are other limitations (particularly related to rock quality and grading). This structure is likely to require ongoing

maintenance to remain functional throughout the consent period. Nonetheless, the bank behind the wall is vegetated (Figure 4) contrasting with the earlier active cliff (Figure 3), suggesting the works are mitigating wave undercutting and preventing aggravation of existing slope instability.

The existing hard protection to the north of the groyne is in a more degraded condition. However, despite the severe engineering limitations, the structure has successfully mitigated wave erosion to date. This will need to be replaced if it is desired to maintain engineered protection in this area over a similar timeframe to the recently constructed revetment.

The benefits of the structures in terms of slope failure are less clear. As they reduce wave erosion at the toe of the bank they do prevent aggravation of existing slope instability – but to what extent they reduce any existing risk for landslide is presently unknown.

The adverse environmental effects of the coastal structures include:

- Degradation of the natural character of the shoreline – the engineering structures imparting a significant "human built" character to the coast. The effectiveness of the structures in mitigating wave erosion has also changed the natural character of the bank– with vegetated banks replacing the active cliffs evident in the natural condition.
- Encroachment of the structures across the foreshore, impacting particularly on public access along the coast at higher stages of the tide. These adverse effects are most significant with the new revetment south of the groyne.
- The structure north of the groyne also has safety issues related to the exposed and rusted railway irons.

The existing structure immediately to the north of the groyne is not likely to be maintained satisfactorily (or cost-effectively) over the same timeframe. However, if the structure were removed, there may be some serious aggravation of erosion in this area. There is uncertainty about the erodibility of the bank materials behind the old rock and rail wall given the slump feature evident in the 1955 photo (Figure 3). Accordingly, it is likely that the rock and rail wall will need to be replaced and maintained over the same lifetime as the existing revetment.

The new structure should however be designed to minimise the seaward encroachment over the beach - ideally trying to stay as close to the footprint of the existing wall as practicable, while providing for appropriate erosion protection over the same lifetime as the existing revetment, and be as short as practicable. The extent of the wall is based on providing protection in areas where the dwellings are currently closest to the cliff edge and where the base of the cliff is more readily erodible than adjacent sections.

Despite the extreme hazard risk suggested by the existing hazard lines, abandonment of the properties in Tuahine Crescent is unlikely to be required unless there is a major landslide event that renders some of the properties unusable. Further detailed investigation of cliff erosion processes and landslide mechanisms in this area is needed to confirm or refine the existing hazard zones. This will better establish the long term prognosis for the properties.

6.2.3 Strategy for Area 2

The following options are promoted for Area 2:

- Implementation of development controls to avoid exacerbation of the erosion risk and to reduce risk over time.
- Review of the existing hazard zones and refine policies and rules.
- Replacement of the existing rail and rock wall north of the groyne ending in the vicinity of the Tuahine Crescent beach access way with a more robust structure – though, as far as practicable, with a similar footprint to minimise adverse effects on beach values. The final extent of the wall will be established during consent level design to establish in more detail the backshore composition and localised erosion risk. The term of the consent for this structure should match the expiry date for the recently constructed revetment.
- Consider complete removal of the rock revetments from the coast once the existing consent for the recent rock revetment expires. Whether these works are replaced with appropriate structures or other action will depend on the understanding of hazards at that time.

Figure 4: View of recent rock revetment in constructed south of the groyne in Area 2 (top) and the historic works south of the groyne (bottom). (Source: Photo taken July 2013, Tonkin and Taylor and Eco Nomos, 2013)

While the rock revetment provides a toe buttress to reduce the rate of erosion at the toe of the cliff, there is still the landslide hazard to consider. Therefore, while the proposed strategy provides for coastal erosion effects, and to some degree, sea level rise effects and therefore provides a reduction of the coastal erosion hazard, it is difficult to comment with certainty on how effective the proposed strategy is on all hazards at this location.

The proposed strengthening and augmentation of the rock wall provides for short to medium term protection with the planning controls preventing significant increase of asset values of property at risk from future erosion. Ongoing beach monitoring should be continued as should monitoring of the effectiveness of planning controls.

6.2.4 Triggers

The trigger for considering alternative treatments such as relocation and removal is linked with the expiry of the resource consents for the existing structures within this section.

6.3 Area 3 – Murphy Road South

6.3.1 Description

This area extends along the foreshore from the Tuahine beach access way to the intersection of Cleary and Murphy Roads. The natural foreshore in this area consists of a sandy beach backed by a bluff generally composed of old estuarine sediments (except in areas close to Tuahine Crescent where the bank is composed of Tertiary mudstones and siltstones). Geotechnical investigation has been carried out (LDE, 2014) to assist in understanding the geology of the backshore area in Area 3. This involved one machine borehole and four electronic cone penetrometer tests along a transect situated along Lloyd George Road to the beach. The results showed the backshore comprises estuarine deposits of silt and sandstone overlying more competent bedrock, although closer to the coast the dense sands extends 3m from the surface and overlies some 11m of softer clayey silt. Some of this softer clayey silt is exposed at the upper part of the beach that increase the erosion susceptibility of the bluff.

Many properties backing the beach extend back around 80m to Murphy Road. However, in some areas, the beachfront sections extend inland only 25-30m from the bluff. Houses on properties are typically setback 15-20m from the top edge of the bluff – except for the northernmost 150m where some houses are only 8-10m landward. The existing High Risk Zone line typically extends 25-30m inland, with three houses situated partially within the Extreme Risk Zone and five within the High Risk Zone (refer Figure 5 and Figure 6).

During rare major storms, a steep erosion scarp can form along the face of the bluff. These near vertical erosion scarps can be impressive due to the height of the bluffs and the beach lowering that occurs in storms. Based on Gibb's aerial photograph analysis (2001) the average rate of retreat of the bluffs prior to protection works was between -0.21 and -0.16 m/yr. Various property protection works have been placed along the seaward face of the bluff following erosion events since the 1960's and 1970's. These structures are still evident in places along much of the length, though are generally

buried or only partly exposed when a high tide beach is present. The existing erosion protection structures are low and overtopped during major storms. Nonetheless, the face of the bluff appears close to the structures suggesting relatively minor net retreat of the bank over the past 40-50 years. It is likely the structures have mitigated erosion to some extent.

Low banks evident in some historic photos suggest limited natural sand trapping and bank repair may have occurred between storms in the natural beach condition. However, native sand trapping vegetation has now largely been eliminated and so little natural repair is presently likely to occur.

In general, the relatively limited rate of bluff erosion and retreat suggests the key processes are associated with the large scale fluctuation of the beach system which exposes the bluff to erosion processes when beach levels are low.

6.3.2 Options discussion

The application of appropriate development controls (e.g. as outlined in Section 5) is critical to reduce and avoid exacerbation of hazard risk.

Existing structures probably perform some erosion mitigation during these periods and, apart from the extreme southern end of the area, also appear to have only limited adverse effects on beach values. Accordingly, most of the structures can probably be left for the immediate future – provided (as a priority) these works are inspected when fully exposed (e.g. after southerly storms which typically strip the sand from the beach in this area) and any elements that could pose a hazard to beach users are removed (e.g. rusty railway iron).

Sand push-up after major storms could be used to assist the recovery process and mitigate erosion provided there was sufficient sand in the upper beach system.

As some houses are still relatively close to the bluff edge, a trigger should be adopted so that appropriate action can be taken in the event of severe erosion. If the top landward edge of the erosion scarp lies within 8m of a dwelling after a major erosion event then appropriate action should be considered. It is important that the trigger is wide enough to enable access around the building if safe removal is going to be considered as a possible management option.

In all likelihood, the most appropriate action might simply be to reinstate the lower eroded bluff face using a beach sand push-up - once the beach has recovered from erosion – though other action may also be required at this location due to the reasonably shallow depth of sand overlying the rock reef platform.

Over time, the application of the setbacks and development controls will ensure that some of the houses too close to the sea are eventually replaced further landward as there is limited room for some to relocate out of the High Hazard Zone.

Figure 5 Identification of properties with dwellings in the Extreme Risk Zone in Area 3

Figure 6 Identification of properties with dwellings in the existing High Risk Zone in Area 3

6.3.3 Strategy for Area 3

The following options are promoted for erosion hazard management in Area 3:

- Implementation of development controls to avoid exacerbation of existing risk and to reduce risk over time.
- Review the existing hazard assessment and refine policies and rules.
- Use of beach push-ups and restoration of natural sand trapping vegetation to facilitate repair of the eroded bluff face after major storms. These measures will only be useful in those areas where there is commonly a high tide beach under normal conditions.
- No further placement of hard erosion protection structures – but existing structures retained and maintained for immediate future subject to removal of those elements that pose a hazard to beach users.

The proposed strategy may provide for ongoing use of the beach and the existing beachfront properties for at least the next 30-50 years. In the longer term (i.e. 50-100 years), use will depend on the response of Wainui Beach to projected sea level rise. If the beach undergoes significant permanent retreat and increased inundation risk, the adverse effects of any hard protection will eventually become untenable. This may lead to the need for further retreat of the hard protection and, possibly even eventual abandonment of the properties - unless future technological advances mean that appropriate soft engineering measures eventually become tenable for the beach as a whole.

6.3.4 Triggers

In view of the fact that some houses are relatively close to the shoreline, consider appropriate action (e.g. reinstatement of the bluff face using a beach push-up or relocation/removal of the asset) if the top landward edge of any new erosion scarp extends to within 8m of a dwelling.

6.4 Area 4 – Wainui Stream

6.4.1 Description

This area is significantly affected by stream flows and migrating stream movements, aggravating erosion relative to adjacent beach areas. This area tends also to be lower lying and there are timber seawalls extending along the esplanade reserve along the southern edge of the stream and within private properties to the north. There are 3 private properties backing the beach in this area. Tangata Whenua are concerned about the impacts of erosion on the waahi tapu site on both sides of Wainui Stream (an old fishing village).

6.4.2 Options discussion

Coastal erosion in this area is aggravated by the stream and historic subdivision on both sides of the entrance has occupied areas that, in their natural state, were periodically subject to erosion. Inundation is also a factor to consider due to the lower lying nature of the land.

Use of development controls is important in this area to prevent exacerbation of the existing hazard over time and to reduce risk where practical. There would also be benefit in reviewing the hazard assessment in this area.

It is also probable that hard structures will continue to be required to protect properties from erosion by the stream, particularly if the sections are primarily composed of loose Holocene sands.

The existing hard structures are not particularly robust but appear to have adequately mitigated erosion for many decades with ongoing maintenance and upgrade. In addition, adverse environmental effects of the structures are relatively minor when the beach is in an accreted state. For instance, the structures are reasonably well set back from the sea along the ocean side and it appears that a high tide sand beach occurs on most occasions, with the walls on the north side also entirely within private property. The structures have also been located to maintain a flared entrance shape, providing for reasonable natural movement of the stream entrance. The walls provide some protection for the waahi tapu site. On the immediate southern side of the entrance, the wooden sea wall also protects a narrow grassed reserve important for public access to the beach. Accordingly, maintenance of the existing structures is deemed appropriate for the short-medium term.

However, action should be taken to soften the effects of the walls where practicable and to extend their lifetime. For instance, it should be practical to develop a low dune over and seaward of the walls to provide a more natural appearance and to help extend the life of the structures along the northern side of the stream. To increase the chance of success of this approach it may be necessary to train the northern side of the stream to limit the stream meander at this side. The natural dune vegetation would need to extend a few metres landward of the wall for the native vegetation to be sustainable, although, it should be expected that the native dune vegetation would be lost in severe erosion events. Use of sand push-ups could also be useful to help maintain the life of the structures, provide additional protection prior to imminent storms and to facilitate restoration and (following erosion) repair of natural dunes. Elements of the existing structures that pose a hazard to beach users (e.g. rusted railway iron protruding up through the beach towards the southern end of the area) need to be removed as a priority.

In addition, it will be important to manage the stream location with periodic machine work (e.g. to prevent excess scour close to the walls – a factor that has necessitated additional scour protection to be placed in the past).

In the medium term, replacement of the existing structures may be necessary as they reach the end of their design life and reasonable maintenance is no longer practical – particularly along the immediate stream margins. The sea walls on the immediate northern margin of the stream (on Council land) could also be moved further landward when replaced to assist with improved vehicle beach access from Pare Street. Any replacement structures required along the ocean foreshore will need to be located further landwards to better provide for natural coastal processes and values.

The trigger for new structures is likely to be severe damage to the existing works such that repair is not practicable or cost-effective. Any new structures will be expensive and complex negotiations will be required in the design and consent process (e.g. in regard to location, cost-sharing, etc). It could be useful to negotiate and agree such details (particularly location) in advance so that replacement can occur relatively quickly when it is required. These difficulties emphasize the importance of using simple soft measures to extend the lifetime of the structures and to reduce adverse effects.

In the longer term, if permanent net shoreline retreat arises (e.g. as a consequence of projected sea level rise), it is probable that any structures along the ocean shoreline will need to be progressively moved landward over time to avoid serious adverse effects. The key trigger for this retreat is likely to be increasing frequency and severity of adverse effects (e.g. beach narrowing) of the structures as the shoreline retreats – though maintenance costs will also provide a signal.

6.4.3 Strategy for Area 4

The following options are promoted for management of erosion hazard in Area 4:

- Development controls to avoid exacerbation of existing risk and to reduce risk over time
- Review the existing hazard assessment and refine policies and rules
- Maintenance of existing hard structures for as long as practicable
- Use of soft measures (e.g. dune restoration and sand push up, control of stream channel location) to extend the life of the structures, reduce adverse effects and enhance natural values and protection
- Consider stream training in the medium term as a tool to augment soft measures being able to be established
- Negotiate appropriate location for replacement sea walls, so that any replacement of the existing structures (design, consenting and implementation) can occur relatively rapidly when it no longer tenable to maintain the existing structures

The above strategy should provide for maintenance of beach values and reasonable use of the properties for at least the next 30-50 years.

In the longer term (i.e. 50-100 years), use will depend on the response of Wainui Beach to projected sea level rise. If the beach undergoes significant permanent retreat and increased inundation risk, the adverse effects of any hard protection will eventually become untenable. This may lead to the need for further retreat of the hard protection and, possibly even eventual abandonment of the properties - unless future technological advances mean that appropriate soft engineering measures eventually become tenable for the beach as a whole.

6.4.4 Triggers

Landward replacement of existing coastal protection structures will be triggered in the event that severe damage precludes ongoing maintenance and/or that adverse environmental effects (e.g. beach narrowing) become sufficiently serious.

If the top landward edge of the erosion scarp lies within 8m of a dwelling after a major erosion event then appropriate action should be considered.

6.5 Area 5 – Pare Street and Wairere Road

6.5.1 Description

The shoreline in this area consists of a sandy beach backed by a high dune. In some areas the high dune is also fronted by a lower incipient foredune, particularly at the northern end where a wide band of foredunes has developed following construction of a training wall on the southern side of the Hamanatua Stream entrance. Important surf breaks occur along this area of shoreline.

The high frontal dune is characterised by a relatively steep historic erosion scarp along the full length. Periodic reactivation of this erosion scarp occurs during rare and severe major storms or erosion events (rip-cells) when a near vertical and very high erosion scarp can form. While this impressive feature has given rise to serious concern in the past, the height simply reflects the height of the dune and the beach lowering that occurs during extreme events. In the past, these erosion events have led to the placement of various sea walls close to the base of the high frontal dune, with these structures being largely buried on most occasions.

The shoreline is largely within private property from Wainui Stream to Oneroa Road and within esplanade reserve along Wairere Road. The houses landward of the main frontal dune are generally well set back from the top edge of the historic erosion scarp, though in places dwellings have been consented very close to this feature. Locating houses close to this feature is very unwise as it is an unambiguous indicator of areas impacted during severe storm erosion.

6.5.2 Options discussion

There is sufficient room on nearly all properties for safe location of a dwelling at least into the medium term 30-50 years (refer Figure 7), though some existing dwellings appear to be too close to the top edge of the historic erosion scarp. There has also been some subdivision which has reduced the long-term resilience of the most seaward properties (refer the 3rd property from the top in Figure 7). Accordingly, the primary options required along this section of shoreline are development controls to avoid exacerbation of risk and to promote reduction of risk over time. This work should be complemented with a review and update of the hazard policies and rules.

Dune restoration and management is also advised along the full length, particularly restoration of native dune vegetation. The vegetation will not stop erosion but will facilitate sand trapping and natural dune repair following erosion events, enhancing the dune as an erosion protection buffer. The work will also restore natural values. The restoration will need to extend landward of the historic erosion scarp along the high dune for the vegetation to be self-sustaining over time. Sand push-ups, appropriately designed, could also be used to facilitate dune repair after severe storms where appropriate.

The seawalls constructed in the past are under-designed to withstand full storm wave energy at Wainui Beach particularly if sea level rise effects result in shoreline retreat. There is also no strong justification for sea walls in this area. The existing structures are largely buried as backstop structures and appear to generally have only minimal adverse effects on the beach, though prevent sand supply to the beach during storm events. In the interim, these structures can be left though over time they could be removed. Removal is most simply facilitated after severe erosion events when the structures are fully exposed.

Figure 7 Identification of properties with dwellings within the Extreme Risk Zone in Area 5

6.5.3 Strategy for Area 5

The following options are promoted for management of erosion hazard in Area 5:

- Implementation of appropriate development controls
- Review the existing hazard assessment and refine policies and rules
- Progressive restoration of native dune vegetation to better facilitate natural dune building and repair, complemented (where required) with sand push ups after severe dune erosion
- Progressive removal of existing sea walls over time, though these features can be left in the immediate future

The proposed strategy should provide for reasonable use of the beach and the adjacent beachfront properties for at least 30-50 years. The longer term prognosis will depend on the response of the beach to projected sea level rise.

6.5.4 Triggers

The 8m setback from the crest of the erosion scarp is required to trigger consideration of appropriate treatments will be required. The most appropriate action will generally be either reinstatement of the eroded dune using sand push ups or landward relocation of the dwellings on the property.

6.6 Area 6 – Hamanatua Stream

6.6.1 Description

This area is more strongly affected by stream processes than the adjacent coastal areas. It extends from south of the timber stream training works to north of the surf club and is backed by reserve land.

6.6.2 Options discussion

The only significant asset potentially at risk in this area is the surf club building and this feature should be located landward of the High Hazard Risk Zone when it is eventually replaced. The public parking area on the southern side of the stream can be readily relocated landward over time if ever required, though periodic sand push-up after severe erosion can be used to manage and repair any erosion in the foreseeable future.

There are no sea walls required in this area, though the existing wooden training wall on the south side of the entrance is a useful feature that should be maintained. This training wall largely prevents the severe stream erosion of low fore-dunes further south, an area that was periodically severely eroded by stream migration in the past. However, the review of the hazard zones should not assume the training wall will remain in the longer term.

Periodic management of the stream using machinery should continue to be provided for in the immediate future to minimise stream erosion, though the need for this work can be reduced over time by ensuring safe relocation of assets.

Dune restoration should be encouraged over time. However, it will be difficult to maintain natural dunes until landward replacement of assets allows the shoreline to adjust to a more natural position to provide adequate space for sustainable dunes.

6.6.3 Strategy for Area 6

The following options are promoted for management of erosion hazard in this area:

- Landward relocation of the surf club and associated parking out of the Extreme Risk Zone to reduce the need for intervention and allow more natural shoreline movements and features
- Review the existing hazard assessment and refine policies and rules
- Maintain stream training works and obtain consent to provide for periodic management of the stream entrance to protect this feature and other assets (e.g. surf club and car parks)
- Restore natural dunes along the coastal margin as landward relocation of assets provides more space for natural shoreline movements

The above strategy should provide for maintenance of beach values and reasonable use of the properties for at least the next 30-50 years.

In the longer term (i.e. 50-100 years), use will depend on the response of Wainui Beach to projected sea level rise.

6.6.4 Triggers

The 8m setback from the crest of the erosion scarp is required to trigger consideration of appropriate treatments will be required. The most appropriate action will generally be either reinstatement of the eroded dune using sand push ups or landward relocation of the surf club.

6.7 Area 7 – Northern Wainui Beach

6.7.1 Description

Northern Wainui Beach extends from Hamanatua Stream to the cliff headlands at Makorori Point. It is substantially beach and dunes backed by recreational reserve, with several beach access points and a stormwater outfall at the northern end. The shoreline is subject to episodic dune erosion and recovery, limited in some places by rock underlying the beach and dune.

6.7.2 Options discussion

The only infrastructure potentially at risk from coastal erosion are car parks. These can be readily reconfigured to pull the seaward edge landward if ever threatened by erosion. As a general rule, upgrade or reconfiguration of car parks should ensure they are well back from the top landward edge of the historic erosion scarp, an unambiguous indicator of the area historically impacted by erosion. The seaward edge of car parks should be kept at least 6-10m back from this feature to avoid future issues and to provide space for a natural dune to seaward.

There is a stormwater outfall towards the southern end of the area. This feature was not examined in the field but aerial photography suggests that periodic aggravated erosion around this feature does not presently pose any threat to assets (e.g. SH 35 to landward). In the event of any future issues, the culvert outlet can be extended slightly further seaward.

Otherwise, the primary action required in this area is to progressively restore the frontal dune to facilitate natural dune building and repair, including restoration of appropriate native dune vegetation and management of beach access to minimise damage to this vegetation. As a minimum, the restored natural dune vegetation should extend at least 5m landward from the top edge of any historic erosion scarps - otherwise the restoration will not be self-sustaining after severe storms.

6.7.3 Strategy for Area 7

The following options are recommended for this area:

- Accept and live with coastal erosion, pulling back car parks if they are ever threatened
- Progressively restore natural dune vegetation along the frontal dune to facilitate natural dune building and repair (and to enhance natural values) – giving priority to areas fronting car parks and areas adjacent to beach access ways

- Extend the stormwater outlet slightly further seaward if scour around this feature ever poses a threat to the state highway. (Ideally, stormwater outlets should not be discharged on the open beach where alternatives are available)
- Review the existing hazard assessment and refine policies and rules.

The above strategy should provide for maintenance of beach values and reasonable use of the properties for at least the next 30-50 years.

In the longer term (i.e. 50-100 years), use will depend on the response of Wainui Beach to projected sea level rise.

6.7.4 Triggers

Reconfigure car parks if the seaward edge of these features is threatened by future coastal erosion. Also, give consideration to undertaking this work where the seaward edges of car parks are within 10m of the top landward edge of historic erosion scarps.

6.8 Area 8 – Makorori Point

6.8.1 Description

This cliff headland delineates the northern extent of Wainui Beach and is heritage reserve. The headland is subject to toe undercutting and associated cliff erosion and slope instability.

6.8.2 Options discussion

The only hazard management required in this area is to ensure that public walkways avoid areas potentially prone to cliff erosion or slope instability. Slope instability could also be reduced over time by moving towards establishment of native trees and shrub cover over the steep seaward margin of the bluff (i.e. the most seaward 100-150m).

6.8.3 Strategy for Area 8

The recommended actions are:

- Keep public walkways away from areas prone to slope instability
- Consider progressive re-vegetation of the steeper coastal margin with native tree and shrubs

6.8.4 Triggers

None recommended.

7 Implementation

Council intends to develop a detailed action plan to assist with its implementation of the Strategy. Listed below, at a high level, are action areas that Council will implement in the short term (next ten years).

i) Review resource management plans

The rules for coastal hazard zones, as well as the objectives and policies that guide implementation of these rules, will be refined to ensure avoidance and reduction of the risk over time. This work will be pursued as part of a wider review of Council's management of natural hazards through its RMA plans.

The coastal erosion hazard zones will also be reviewed. The timing of this review will depend on resources and will need to be prioritised against other hazard research.

ii) Obtain resource consent for sand push-ups and plan for response

The Council will apply for resource consent for beach scraping work along Wainui Beach in those parts of Areas 3 to 6 where there is commonly a high tide beach under normal conditions. This will allow Council to respond in the event of severe erosion that threatens dwellings (scarp lies within 8m of the dwelling). Detailed limits on the use of beach scraping will need to be developed to support the application.

iii) Review dune care programme

Council will review the level of funding and support it allocates to dune care programmes along Wainui Beach through the Ten Year Plan in light of the strategy's proposal for increased dune restoration and planting by working with the community. These resources will need to be prioritised against other Council activities.

iv) Replace rock and rail wall north of the groyne

The strategy proposes replacement of the rail and rock wall north of the groyne, ending in the vicinity of the Tuahine Crescent beach access way, with a more robust structure.

Council will firstly undertake further consultation with the landowners behind the structure, as well as funding and design investigations before seeking any resource consent.

v) Maintain walls around Wainui Stream and support with soft measures

The walls around Wainui Stream (Area 4) will continue to be maintained by Council. Council will also consider soft measures (e.g. dune restoration, sand push up, control of stream channel location) to extend their lifetime. Stream training walls will also be considered as indicated for the medium term.

vi) Maintain Hamanatua stream training wall and manage stream

Council will continue to maintain the wall south of Hamanatua Stream. Council may also need to manage the stream entrance from time to time to minimise stream erosion that could threaten neighbouring assets.

vii) Retain other hard protection structures but remove safety hazards

Council intends to leave the other hard protection structures along the beach in the short term but inspect them when exposed (e.g. after southerly storms) and remove any elements that pose a hazard to beach users (e.g. rusty railway iron).

viii) Relocate car parking in reserve if threatened

If car parks north of Hamanatua Stream are threatened by erosion Council will consider relocating them landward.

ix) Possible extension of the stormwater outlet

Consideration will be given to extending the stormwater outlet at southern end of Area 7 seaward if it poses a threat to assets including the state highway.

x) Ensure public walkways in Makorori Point are kept away from areas prone to erosion

xi) Consider revegetation of steeper coastal margin with native trees and shrubs

xii) Review erosion monitoring programme

Council will review the coastal erosion monitoring programme, giving consideration to the recommendations in the Tonkin and Taylor and Eco Nomos report (refer to their report for further detail):

- Bi annual surveys and photographs of profiles indicated in Figures A1 and A2
- Review of monitoring results at least every five years with discussion of water level changes within the survey period.
- Commissioning of new aerial photographs / LiDAR at least every ten years.

8 Funding Considerations

The Key Stakeholder Forum recommends that Council consider the matters listed below when making decisions about how to fund the actions in this strategy. At the time of adoption of the Strategy the Council has yet to decide on funding options but acknowledges these matters for further consideration including through the Ten Year Plan process.

i) A broad vision and goals underpin the Strategy

- The purpose of the WBMS (identification of the preferred management of coastal erosion) sits within a broad vision of integrated management of Wainui Beach that conserves and enhances the environment for future generations. Broad goals and principles were developed to guide the development of the strategy, which aim to protect the many values of Wainui Beach:
  - *Economic values – "surfonomics" (the value to the economy from surfing); used for events that bring tourists*
  - *Natural character and amenity values*
  - *Ecological – habitat for indigenous flora and fauna*
  - *Recreational – swimming; fishing; fitness; a key destination for surfing; etc.*
  - *Iconic values / identify – some consider Wainui an important icon for our District*

ii) Benefits of implementation of the Strategy

- It is considered that, without a coordinated and strategic approach to erosion through the Strategy, there is likely to be ad-hoc response to coastal erosion events. This is likely to have a negative impact on the values identified above.
- A coordinated and strategic approach to erosion management at Wainui Beach should help to reduce ongoing decision-making and litigation costs to Council, and therefore also the wider ratepayers of the Gisborne District.
- Dune restoration promoted in the Strategy will help to enhance the natural character and amenity values of Wainui Beach.
- The replacement of the structure north of the concrete groyne with a more robust structure should help to reduce maintenance costs and address safety issues relating to exposed and rusted railway irons.

iii) Contributors to the issues / exacerbators

- Development at Wainui Beach occurred under the security of publically managed and subsidised protection work schemes. Private investment was encouraged that is now at risk.
- Climate change is likely to cause beach retreat, especially in the medium to longer term. This erosion driver is beyond the control of the local community.
- Removal of large volumes of cobbles from Wainui Beach by the Gisborne Harbour Board may have contributed to erosion issues at the southern end of the beach.
- The Key Stakeholder Forum members also believe increased stormwater volumes as a result of inland subdivision contributes to erosion events to which the strategy responds.

iv) Affordability

- Wainui residents already pay high rates.
- While there is a perception that residents have a high income the equivalisative analysis done by BDO Spicers (2008) found about 15% of households in Wainui/Okitu could be considered "poor" and a further 24% are below the median income.

v) Consistency / equity

- Beachfront properties owners have already paid a large contribution to managing the issue over the years through the targeted rates.
- Erosion control protection works have been funded from broad funds (rather than targeted rates) in other areas.

9 Other Stakeholder Concerns

During the development of this strategy members of the Key Stakeholder Forum noted their concern about a number of matters not considered within the scope of the project. The Council, in adopting this strategy, notes these concerns (listed below) and suggests the following methods/processes for dealing with them.

Matter Raised	Approach
Volume of stormwater	Continued use of existing planning rules & Low Impact Urban design (L.I.U.D). Freshwater Plan.
Quality of stormwater	Freshwater Plan.
Wastewater leaching	Increased monitoring for onsite waste water systems.
Stormwater management	Request for Services lodged for assessment of stormwater outlets and other uncontrolled runoff onto the beach.
Protection of Wahi Tapu	Coastal Reserves Management Plan.
Use of council road reserve for building relocation	Not an immediate issue but could be given further consideration in the future.
Restoration of natural flora & fauna	Dune Enhancement Group, Womans' Native Tree Trust, Crimson Trust, Department of Conservation and Coastal Reserves Management Plan.
Dogs on Wainui Beach	Animal Control.
Vehicles on beach	Report to the Police. Implementation of the New Zealand Coastal Policy Statement - Policy Review.

APPENDICES

APPENDIX ONE

NOTES:

1. Aerial photo supplied by Gisborne District Council

SCALE 1: 10,000

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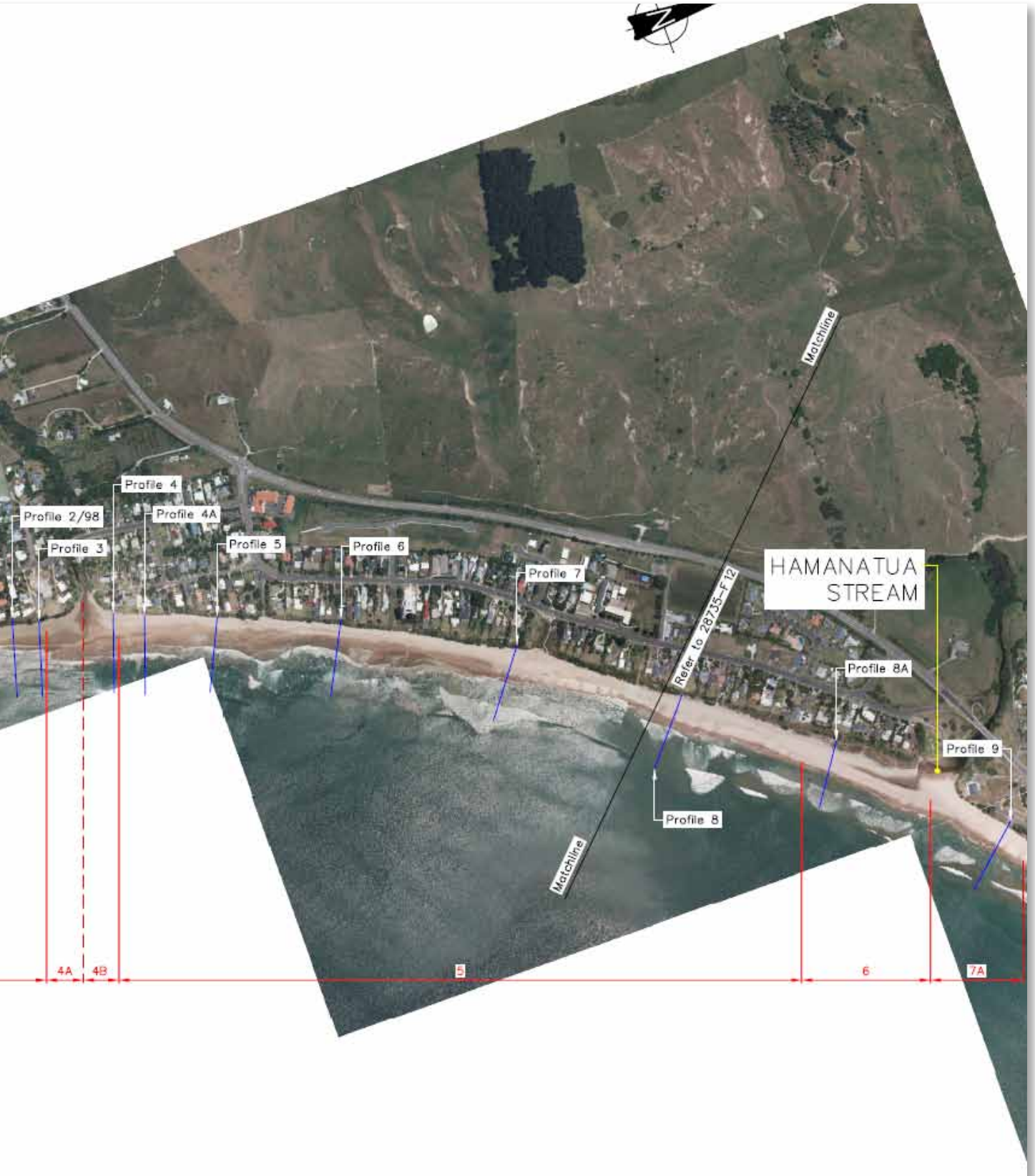

Tonkin & Taylor Environmental and Engineering Consultants 105 Carlton Gore Road, Newmarket, Auckland www.tonkin.co.nz	DRAWN	EAA	Feb. 14
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	APPROVED		
	CADFILE : \\28735-FA 1.dwg		
	SCALES (AT A3 SIZE) 1: 10000		
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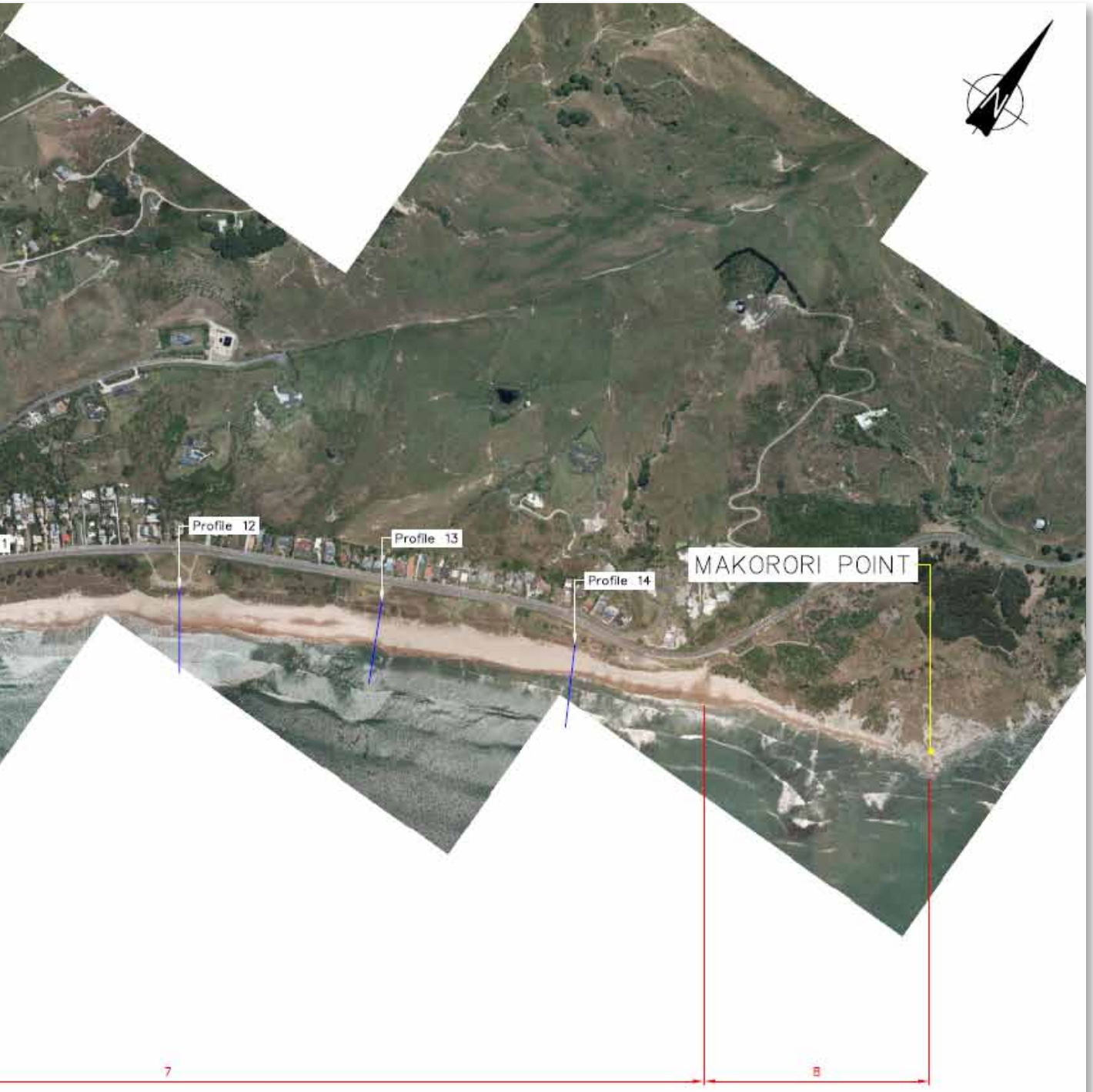
GISBORNE DISTRICT COUNCIL
WAINUI BEACH MANAGEMENT STRATEGY
Plan – Sheet 1

NOTES:

1. Aerial photo supplied by Gisborne District Council

SCALE 1: 10,000

100 200 300 400 500 (m)



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Environmental and Engineering Consultants
105 Carlton Gore Road, Newmarket, Auckland
www.tonkin.co.nz

DRAWN	EAA	Feb. 14	
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APPROVED			
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SCALES (AT A3 SIZE) 1: 10000			
PROJECT No. 28735	FIG. No. Figure A2		REV. C

GISBORNE DISTRICT COUNCIL
WAINUI BEACH MANAGEMENT STRATEGY
Plan – Sheet 2

APPENDIX TWO

Terms of Reference Key Stakeholder Forum

Overview

Gisborne District Council (GDC) is engaging with stakeholders to develop a Wainui Beach Management Strategy (WBMS). The planning process is being managed by a GDC WBMS Project Team. GDC's engagement with stakeholders is through a Key Stakeholder Forum (KSF) supported by a Working Group (WG). This document provides the Terms of Reference for the KSF.

Wainui Beach Management Strategy Purpose

Gisborne District Council seeks to develop a sustainable Wainui Beach Management Strategy that:

- Identifies the preferred management of coastal hazards affecting Wainui Beach
- Takes into consideration the wider economic, environmental, social, recreational and cultural context
- Has broad acceptance amongst the community
- Provides a framework for future development and decisions related to Wainui Beach

Key Stakeholder Forum Purpose

The Key Stakeholder Forum brings multiple stakeholder perspectives together to ensure the development of a sustainable Wainui Beach Management Strategy that takes into consideration the wider economic, environmental, social, recreational and cultural context and that has broad acceptance amongst the community.

Key Forum Functions

1. To ultimately recommend a Wainui Beach Management Strategy to GDC
2. To endorse the membership of a Working Group that will undertake the detailed planning work, represent and integrate perspectives, tackle and resolve issues, and make recommendations to the Key Stakeholder Forum.
3. To monitor and guide the Working Group, including:
    a) Agree the Working Group's work plan
    b) Review the Working Group's outputs at agreed key milestones
    c) Review the Working Group's reports and recommendations
    d) Provide feedback to the Working Group
4. To act as a conduit to stakeholder constituencies including:
    a) Communicate in advance the agenda for Key Stakeholder Forum meetings
    b) Keep informed of WBMP progress
    c) Seek feedback on key issues
    d) Consulting on proposed recommendations to GDC

Membership

1. Members will be self-selected
2. Brian Wilson, GDC Councillor will chair the Key Stakeholder Forum
3. Representation sought from all key stakeholder groups
4. Other Wainui Beach stakeholders who can commit to the following membership expectations

It is expected that members will:

- Be fair and transparent – Have a genuine commitment to fairness and transparency
- Be willing to think together – Have a willingness to think together to resolve issues
- Make an informed contribution - Have a genuine commitment to keep up to date with WBMS information in order to make an informed contribution
- Provide continuity - Be available for the full project term; able to commit to meetings (80%)

Meetings

Meetings will be approximately each 4 to 6 weeks at key WBMS milestones.

Decision Making

Key Stakeholder Forum decisions will be made by consensus; with the definition and process for achieving consensus to be agreed at the first Key Stakeholder Forum.

Term

The Key Stakeholder Forum is a fixed term forum. Its term is for the WBMP planning period and terminates when the GDC approves a new Wainui Beach Management Strategy.

Members

Jeff Allen
Sandy Bull
Simon Cave
Andy Cranston
De-Arne Sutherland
Phil Dreyfuss
Paul Ericson
Dein Ferris
Fleur Ferris
Larry Foster
Virginia Gunnes
Jennie Harrē Hindmarsh
Deidre Hart
Deryk Jenson
Allen Marx
Susan Marx
David & Anna McIntyre & Rickman
Michael Muir
Jamie Quirk
Nikki Searanke
Suzanne Bull
Mike Vita
Neil Weatherhead

Terms of Reference Working Group

Overview

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Gisborne District Council seeks to develop a sustainable Wainui Beach Management Strategy that:

- Identifies the preferred management of coastal hazards affecting Wainui Beach
- Takes into consideration the wider economic, environmental, social, recreational and cultural context
- Has broad acceptance amongst the community
- Provides a framework for future development and decisions related to Wainui Beach

Working Group Purpose

The Working Group's purpose is to integrate the perspectives of multiple stakeholders in the development of the Wainui Beach Management Strategy; work through the important and substantive issues; and to make recommendations to the Key Stakeholder Forum for a sustainable WBMS that takes into consideration the wider economic, environmental, social, recreational and cultural context and that has broad acceptance amongst the community. E.g. analysing tough problems, creating innovative options

Working Group Functions

1. To work within the guidance and oversight of the Key Stakeholder Forum
2. To agree a work plan with the Key Stakeholder Forum
3. To work through the important and substantive issues that need to be addressed in the WBMS e.g.analysing tough problems; generating innovative solutions
4. To seek confirmation from the Key Stakeholder Forum at key milestones
5. To develop options for consideration by the Key Stakeholder Forum and to make recommendations to the Key Stakeholder Forum on preferred options
6. To report monthly to the Key Stakeholder Forum on progress against the agreed work plan

Membership

1. GDC will appoint members (5 – 7)
2. Kevin Strongman, GDC's WBMS Project Manager will chair the Working Group
3. Members will be part of the Key Stakeholder Forum and endorsed by the Key Stakeholder Forum
4. Important perspectives to be covered by the members are: GDC; Beachfront ratepayers; Beachfront residents; Tuahine Crescent residents; Wainui residents (Non-beachfront); Ngati Oneone; Wainui/Okitu Residents & Ratepayers Association; Wainui Coast Care Group; Previous Wainui Beach Management Strategy Committee; Surfing community; Life stage

Key criteria for selection:

- Availability - Able to commit to regular meetings over the length of the project
- Accountability – Commitment to meet agreed between meeting tasks and timeframes
- Identified perspectives – Able to bring one or more key stakeholder perspectives
- Complementary mix of perspectives – That the mix of members covers all important perspectives
- Length of Wainui Beach involvement – Experience of the changes in Wainui Beach over time
- Genuine commitment to build mutual understanding – Bring an ongoing commitment to represent and listen to the perspectives of multiple stakeholders; integrate the perspectives of multiple stakeholders when addressing substantive issues and generating solution options.
- Commitment to consensus – A willingness to take a consensus Working Group view to the KSF

Meetings

Meetings will be for approximately for 2-4 hours every 1 – 3 weeks.

Decision Making

Working Group recommendations to the Key Stakeholder Forum will be made by consensus; with the definition and process for achieving consensus to be agreed at the first Working Group meeting.

Term

The Working Group is a fixed term group. Its term is for the WBMS planning period and terminates when the GDC approves a new Wainui Beach Management Strategy.

Members

Anne Muir
Chris Shaw
Dick Calcott
Ingrid Searanke
John Logan
Kevin Strongman
Peter Anderson
Ronnie Amann

APPENDIX THREE

References

BDO Spicers Gisborne Ltd. (2008) Affordability analysis: Proposed Wainui/Okitu & Makarori Communities, Water and Wastewater Upgrade. Report prepared for Gisborne District Council.

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Land Development and Exploration Ltd. (LDE) (2014). Wainui Beach Sand Depth Investigation Factual Report. Project Reference 11044. Report prepared for Gisborne District Council.

Tonkin & Taylor Ltd. and Eco Nomos Ltd. (2014). Wainui Beach Management Strategy. Report prepared for Gisborne District Council.

Legislation, Policy Statements and Plans

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Gisborne District Council Regional Policy Statement (operative 2002).

Gisborne District Combined Regional Land and District Plan ("District Plan") (Gisborne District Council, part operative 2006).

New Zealand Coastal Policy Statement 2010.

Proposed Regional Coastal Environment Plan for the Gisborne District (Gisborne District Council).

Wainui Beach Management Strategy 2003. (Gisborne District Council, 2003).

Refer also the list of references in the Background and Discussion Document (GDC 2013) for additional documents that were used in the development of this strategy.

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