Report

Hastings Coastal Environment Strategy Technical Paper #4 – Erosion & Hazards

Prepared for
Hastings District Council

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Prepared for

HASTINGS DISTRICT COUNCIL

By

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1. INTRODUCTION

The core purpose of the Hastings Coastal Environment Strategy (HCES) is to establish a comprehensive strategy that "will enable the community to develop an integrated regime to protect, manage and develop the coastal environment". The strategy has a planning horizon of 20 years, hence the recommendations and outcomes of the strategy are intended to go beyond the ambit of the Resource Management Act to encapsulate wider Council functions and responsibilities and to extend beyond the strict 10 year life of the District Plan.

A key issue for sustainable and integrated management relates to recognition of, avoidance, planning and where appropriate remediation of natural hazards including coastal erosion, inundation, land instability and tsunami.

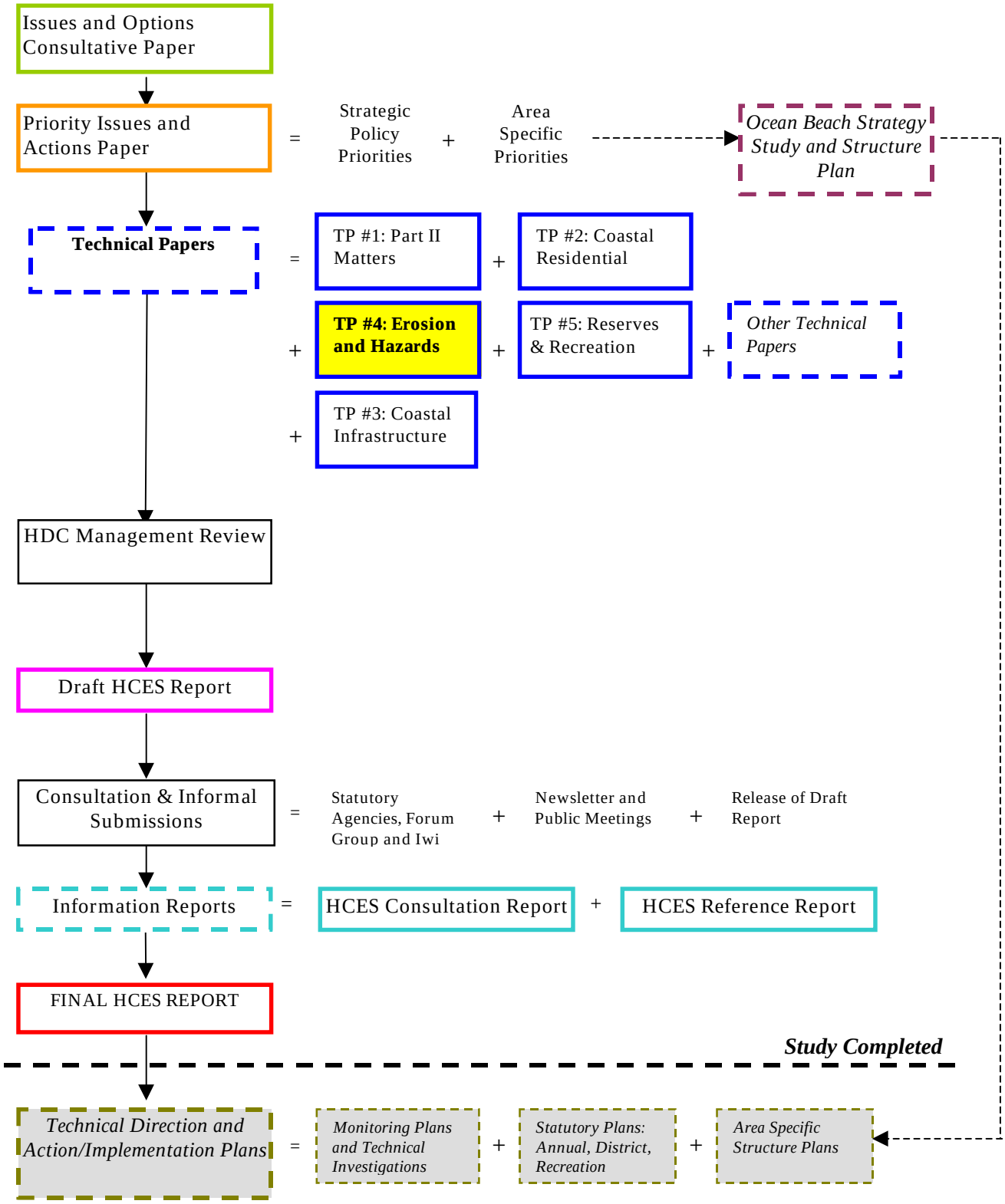
The Hastings coastal environment is dynamic and subject to diverse natural processes. In natural areas and well managed rural areas these processes generally present few problems. However a history of poor siting of existing settlements and developments and ad hoc approaches to intervention, has lead to the creation and sometimes exacerbation of hazards to both people and property. Pastoral farming practices and vegetation clearance has also lead to slipping and subsidence on rural land along the coast which in addition to increasing the severity of instability hazards, also generates significant adverse environmental effects particularly in terms of water quality impacts (sedimentation) and landscape impact.

The purpose of this short technical paper is to summarize relevant existing information and work pertaining to natural hazards in the Hastings coastal environment and to establish a set of general parameters and locality specific objectives for hazard avoidance and management. Preparation of this paper relies on interpretation of existing information. No further field research has been undertaken as part of the HCES project and significant gaps in the understanding of coastal processes mean that a precautionary approach to planning and development remains a prime consideration[1].

The paper identifies statutory requirements relevant to hazard avoidance, planning and mitigation and highlights a number of priority issues established for the various management areas along the Hastings coast line. A series of strategic objectives and policies are proposed for guiding public and private planning and practice and suggestions are then offered on how these strategic directions are best translated into hazard management strategies for specific coastal communities. Areas requiring further work subsequent to release of the HCES are also identified. Consistent with the integrated approach to the HCES, the paper is one of a series aimed at addressing key technical issues. (refer Figure 1.1).

[1] *For example survey information for rates of erosion is only available for 15% of the Hawke's Bay coast.*

Figure 1.1 HCES Study - Process Schematic



2. LEGISLATION FRAMEWORK

2.1. RESOURCE MANAGEMENT ACT

Technical Paper 1 provides an overview of the Purpose and Principles of the RMA, in particular Part II matters of relevance to the Hastings Coastal Environment. These core principles are not repeated here.

Other relevant provisions of the RMA are summarised below:

Part IV of the RMA outlines the functions, powers and duties of central and local government.

Section 30 states that it is a function of regional councils to develop objectives, policies and methods for controlling the use of land, water and areas of the CMA for the purpose of avoiding or mitigating natural hazards. Section 31 states that it is a function of territorial authorities to establish and implement objectives, policies and methods to achieve integrated management in relation to the effects of land use and development and to control any actual or potential effects of use, development or protection of land for the purpose of avoidance or mitigation of natural hazards[2].

Section 35 obligates every local authority to gather certain information, monitor and keep records including "records of natural hazards to the extent that the local authority considers appropriate for the effective discharge of its functions".

Part V of the RMA outlines the requirements for policy statements and plans. Under sections 62 (RPS), 65 (RCP), 75 and 76 (DP) regional and territorial government can prepare plans, policies, methods and rules in relation to managing the effects of natural hazards, and the effects of land use on natural hazards.

Under Part VI (Section 106) the Act states that a consent authority shall not grant a subdivision consent if it considers that either –

"(a) Any land in respect of which a consent is sought, or any structure on that land , is or is likely to be subject to material damage by erosion, [falling debris,] subsidence, slippage, or inundation from any source; or

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[2] *Jurisdiction in respect of natural hazards has been clarified through case law. In Canterbury RC v Banks Peninsula DC (1995) NZRMA 10, noted [1995] BRM Gazette 5 (PT) (see CN441); the Court agreed that the RMA did not require regional council's to control the occurrence of a natural hazard, rather the effect is to be avoided or mitigated. The control of the use of land for natural hazard avoidance or mitigation is within the powers of both regional and territorial government. It is consistent with a regional council's functions to achieve integrated management for it to investigate flood plain hazards and institute appropriate controls on a regional basis rather than through individual TA's. The Court observed that there will be occasions where such matters need a regional approach and others where this is not necessary or where interim or additional steps need to be taken by a TA.*

(b) Any subsequent use that is likely to be made of the land is likely to accelerate, worsen, or result in material damage to that land, other land, or structure, by erosion [falling debris,] subsidence, slippage, or inundation from any source-"

The consent authority may grant consent if it is satisfied that sufficient provision has been made or will be made to avoid, remedy or remedy the hazard.

Section 106(2) indicates that consent can be granted if the hazard will be avoided, remedied or mitigated by one or a combination of rules in the district plan, conditions of a resource consent or other matters including works[3]. Under Part X Subdivision and Reclamations, Section 220 provides for a condition of subdivision consent to be imposed to protect land against hazards.

Section 330 (Part XII) of the Act provides for emergency works to take preventative or remedial action to avoid or mitigate any sudden event causing or likely to cause loss of life, injury or serious damage to property. Case law indicates that the test of "suddenness" is important to determine whether the provisions of Section 330 can be relied upon for intervention without prior resource consent. For example damage by storms did not fulfill the test because these are not unexpected[4]. Likewise where a Council has failed to act for several years to address an issue, it could not then rely on the emergency powers under the Act[5]. The statute requires that there must be both immediacy and urgency.

Lastly, the Fourth Schedule of the Act outlines the matters to be included and considered in AEE prepared to accompany resource consents. The schedule includes a requirement to consider "any risk to the neighbourhood, the wider community, or the environment through natural hazards…."

2.2. POLICY STATEMENTS AND REGIONAL PLANS

Specific policy direction of relevance to natural hazards planning is contained in the New Zealand Coastal Policy Statement (NZCPS), Without repeating all provisions of the NZCPS in detail, key policies are summarized below:

- *NZCPS Policy 3.3 - Adoption of a precautionary approach to activities with unknown, but potentially significant adverse effects is warranted given the relative lack of understanding about coastal processes.*

- *NZCPS Policy 3.4 – Recognition of hazards and provision for avoiding or mitigating their effects including:*
  - *identification of hazard areas in plans*
  - *recognition of the potential for sea level rise and consequential erosion or inundation.*
  - *identification and protection of natural defence systems including beaches, sand dunes, mangroves, wetlands and barrier islands.*
  - *recognition of the potential for natural systems to retreat and migrate inland as a result of dynamic coastal processes.*

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3 Case law which gives guidance to the implementation on section 106 includes Bosworth v Rodney CC, Planning Tribunal 24/2/83, Chilwell.J, HC Wellington A350/81, M4/82; Fisher v Manukau CC A48/83 (PT) and Maruia Soc Inc v Whakatane DC 8/3/91 Doogue HC Rotorua.

4 See Gisborne DC v Falkner A82/94

5 See Waiheke Island Country Club Ltd v Auckland CC EnvC W5/98.

- *ensure new development is located and designed so that the need for hazard protection works is avoided.*
- *ensure that coastal protection works are the best practicable option to protection of existing uses and development before selecting this option. Abandonment or relocation of existing structures should also be considered.*
- *ensure that the location and design of protection works avoids, remedies or mitigates adverse effects.*

The Proposed Hawke's Bay Regional Resource Management Plan (PHBRRMP) and Hawke's Bay Regional Coastal Plan (HBRCP) reinforce the provisions of the NZCPS. Section 4.1 of the PHBRCP includes specific policy (4.1.5 and 4.1.6) with regard to coastal erosion and tsunami hazard. The key elements of this policy direction are as follows:

- *That HBRC when undertaking its coastal management role including assessing coastal permit applications will have regard to existing information on erosion rates[6] and tsunami hazard scenarios[7].*

- *That HBRC will encourage TLA's to recognise and avoid, or where avoidance is not practical, mitigate the erosion and tsunami coastal hazards identified, and to take these into account when assessing development and subdivision proposals.*

The PHBRRMP indicates that the HBRC will use a range of non-regulatory methods including liaison with TLA's, and works and services to address hazard. The plan proposes that hazard avoidance and mitigation be focused as a first priority on areas of high population density.

Chapter 7 (section 7.4.2) of the PHBRRMP provides further information on how the Plan is to be implemented. It is noted that the HBRC believe that TLA's should be responsible for rule formulation in relation to hazards with the HBRC role being "key information provider" of up to date and accurate information on hazard assessment.

2.3. DISTRICT PLAN POLICY

The Transitional District Plan (former Hawke's Bay County District Scheme) identifies three Conservation Areas (1 through 3) which control land use and development on steep erosion prone land, within the main river courses and within the coastal margins .

Policies for Conservation Area 1 focus on conserving steep land to reduce erosion, stream sedimentation and exacerbation of down-stream flood hazard. Despite the steepness of large areas along the coastal fringe, there are no Conservation 1 areas along the coast, these being confined to mountainous inland country at catchment headwaters.

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[6] *Schedule IV of the HBRCP contains information on historical erosion rates and the on-going monitoring programme.*

[7] *The Plan identifies three faults that could cause tsunami that have been modelled for Hawke's Bay These are the Hawkes Bay source (wave height prediction 1.5m), the Waimarama source (wave height 2m) and the Hikurangi Trough source (wave height up to 3m). Details of warning times are also given. The Plan also notes that the current predicted sea level rise due to Climate Change is 0.65m by 2100.*

Policies for Conservation Area 2 provide for river control works and control land uses within the flood channels. Conservation 2 areas extend down to the coast to merge with the Conservation 3 zone which extends along the coastal margin to identify areas at risk of erosion and inundation.

Conservation Area 3 is intended as a definition of the coastal hazard area. The width of the area varies depending upon geological structure of the coast, topographic features and recorded storm events. The width is based on the calculated rate of erosion for a 100-year period plus an additional safety factor of 50m.

The Conservation 3 area introduces controls on building design and location and also promotes sensitive treatment of the delicate foredune area. In this regard it is interesting to note that "Vehicle-based recreation such as trail bike riding" is prohibited in the Conservation Area 3[8].

The Proposed Hastings District Plan 1997 (PHPD) contains a number of relevant sections which are summarized below.

In Section 2.4 (Urban Development and Strategic Urban Directions) policy UDP6 states:

"Provide for the implementation of programmes to reduce the susceptibility of existing residential areas to natural hazards (notably flooding) in order to maintain and expand their residential capacity".

Section 2.7 of the PHPD outlines the coastal environment strategy for the district. Much of the policy direction in this section is founded on an interim, precautionary approach pending the outcome of the HCES project. Policy CEP5 seeks to establish appropriate provisions to address the effects caused by natural coastal processes.

Section 8 of the PHDP addresses the residential zones. The Plan notes that coastal settlements including Clive, Haumoana and Te Awanga have flooding problems whilst potential flood hazard is identified as a constraint at Waipatiki. Coastal erosion is identified as a hazard at Haumoana, Te Awanga and Waimarama.

Section 12.3 of the Plan introduces provisions for the "Natural Hazards Resource Management Unit". Hazards identified include flooding, seismic activities, coastal hazard land instability, climatic conditions, volcanic fallout and fire. The Plan notes that it does not seek to address those issues which are more appropriately addressed through other mechanisms such as the Building Act. The Plan promotes an integrated approach with HBRC to management.

Relevant objectives and policies of Section 12.3 are as follows:

"NHO1 "To identify and minimise the effects of natural hazards on the community and natural and physical resources.

NH02 To ensure that future resource management decisions address the possible effects of natural hazards.

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[8] Vehicle based recreation is very common along the Hastings coast and in some areas there is clear evidence of adverse effects. However there are no records indicating that HDC or their predecessor has ever used this rule to control the activity.

NHP1 Control land use activities in identified natural hazard areas where communities and resources are at risk.

NHP2 Develop a database that identifies areas at risk from natural hazards and the level of risk in the Hastings District.

NHP3 Ensure that activities intended for human habitation in an identified hazard RMU avoid, remedy or mitigate natural hazards.

NHP4 Allow public bodies exercising their statutory powers to carry out natural hazard mitigation works.

NHP5 Require that land use activities do not exaggerate or create additional effects on the community and the environment from the effects of a natural hazard.

NHP7 Provide and build upon an information database to encourage more informed decision making in terms of natural hazards."

In response to these policies the PHDP identifies a series of hazard RMU's where additional land use and development controls apply. Those of particular relevance to the HCES (and their implications) are as follows:

Haumoana Inundation RMU – minimum ground levels for a habitable building site shall be RL 11.5m and minimum floor levels 0.5m above ground level. On site waste water systems shall be designed to ensure that their contents do not mix with flood waters in the 1 in 50 year flood event.

Flooding RMU (applies to Clive and Te Awanga) - minimum ground levels for a habitable building site shall be RL 11.5m and minimum floor levels 0.5m above ground level. On site waste water systems shall be designed to ensure that their contents do not mix with flood waters in the 1 in 50 year flood event. Any filling or excavation shall not exceed 10m3

Coastal Hazards RMU – generally applies to the same coastal margin as per the Transitional Plan. No specific rules apply but the following general performance standard applies to all activities:

"(a) Any activity shall avoid or mitigate the effects of natural hazards.
(b) The location, design methods and materials of construction shall ensure that they avoid or mitigate the effects of natural hazards."

In our opinion, these general provisions are likely to be ultra vires as they offer no certainty for compliance and would be difficult to measure, interpret or enforce[9]. In comparison to the specific rules applying to the flooding and fire RMU's they offer little for hazard management or mitigation.

[9] *We understand that submissions to the PHDP seek to have these provisions replaced or withdrawn. In our opinion a set of specific measurable Coastal Hazard RMU rules are warranted. Suggestions in this regard are offered in section 5 of this technical paper.*

2.4. OTHER LEGISLATION

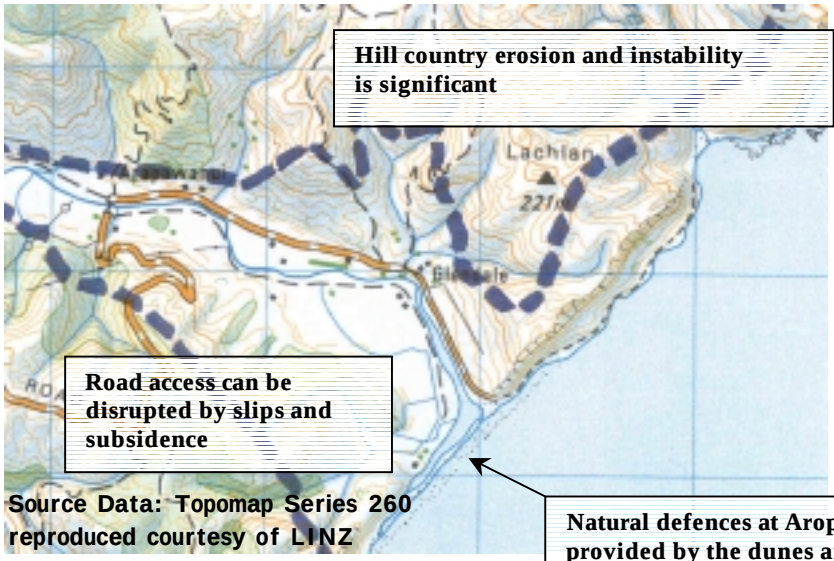
Other legislation with direct relevance to infrastructure provision includes the following:

- *Building Act 1991 - provides Council the primary responsibility for administering and granting building consents. The Act expressly provides for the refusal of consents on the grounds of hazards. In conjunction with the Building Act, Building Regulations 1992 set standards for construction including standards in hazard prone areas.*
- *Soil Conservation and Rivers Control Act 1941 – provides authority for soil management and river works associated with hazard management.*
- *Local Government Act 1974 – assessment and approval of subdivision applications (section 274 outlines those circumstances where subdivision shall not be permitted) including areas subject to erosion, subsidence, slippage, or inundation or to any land where subdivision is likely to accelerate, worsen or result in the above elsewhere.*
- *Civil Defence Act 1983 – provides for planning and other responsibilities by agents such as Council to national emergencies and civil defence.*

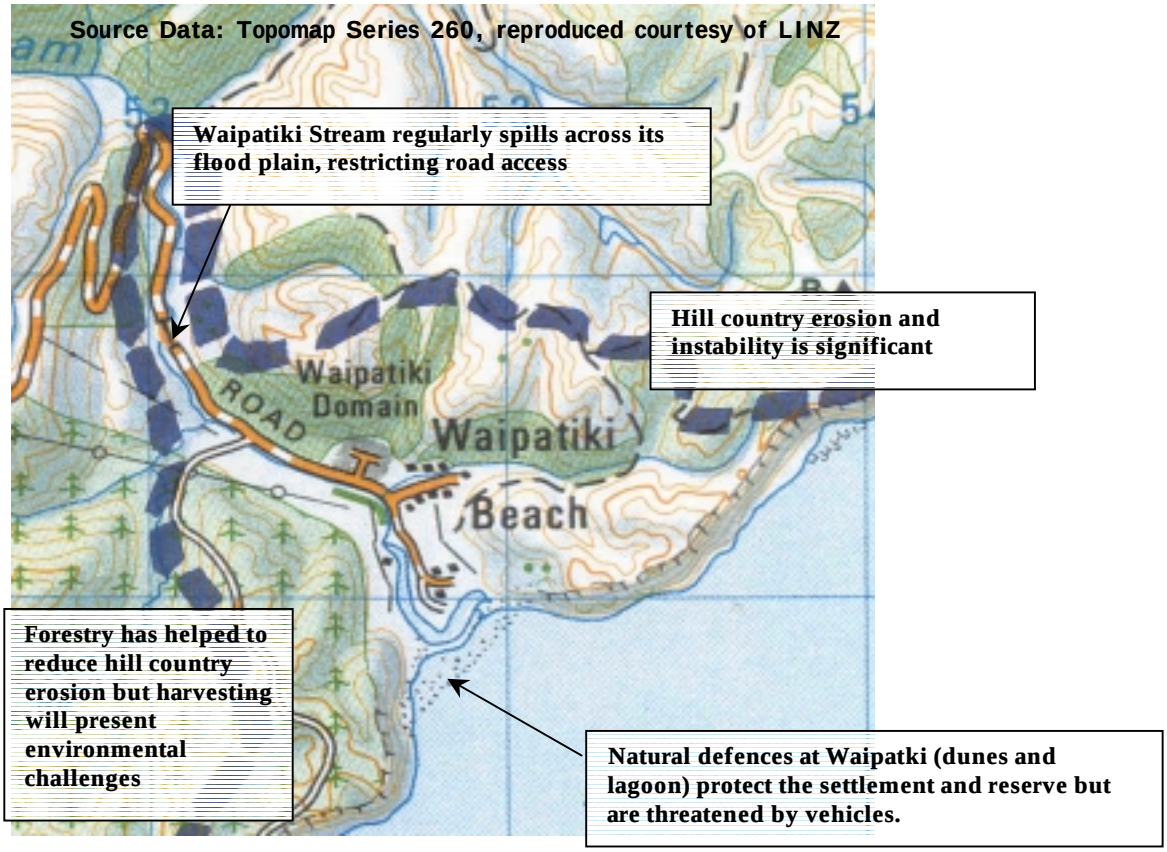
3. AREA SPECIFIC MANAGEMENT ISSUES

The following series of maps illustrate natural hazards impacting upon specific settlements and localities along the Hastings coastline.

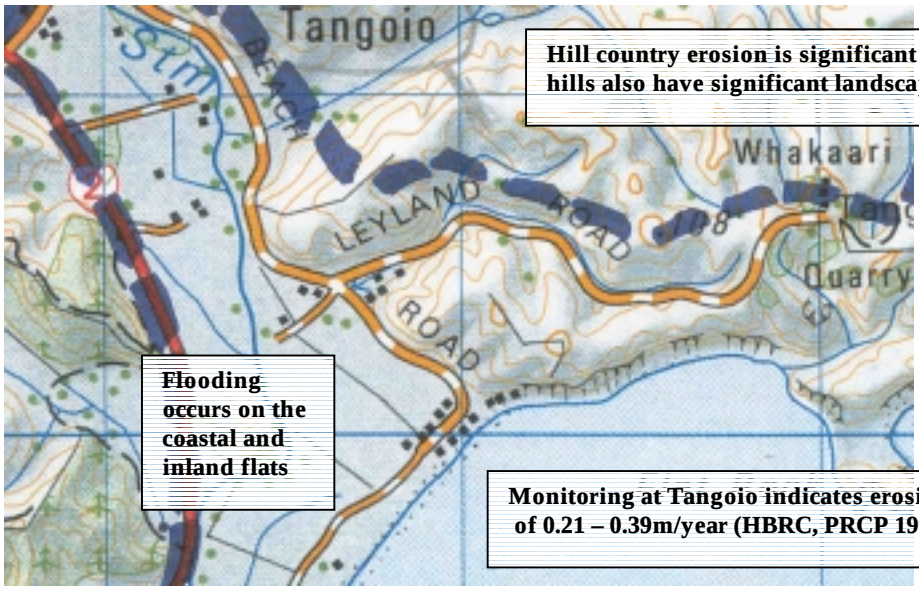
3.1. AROPAOANUI



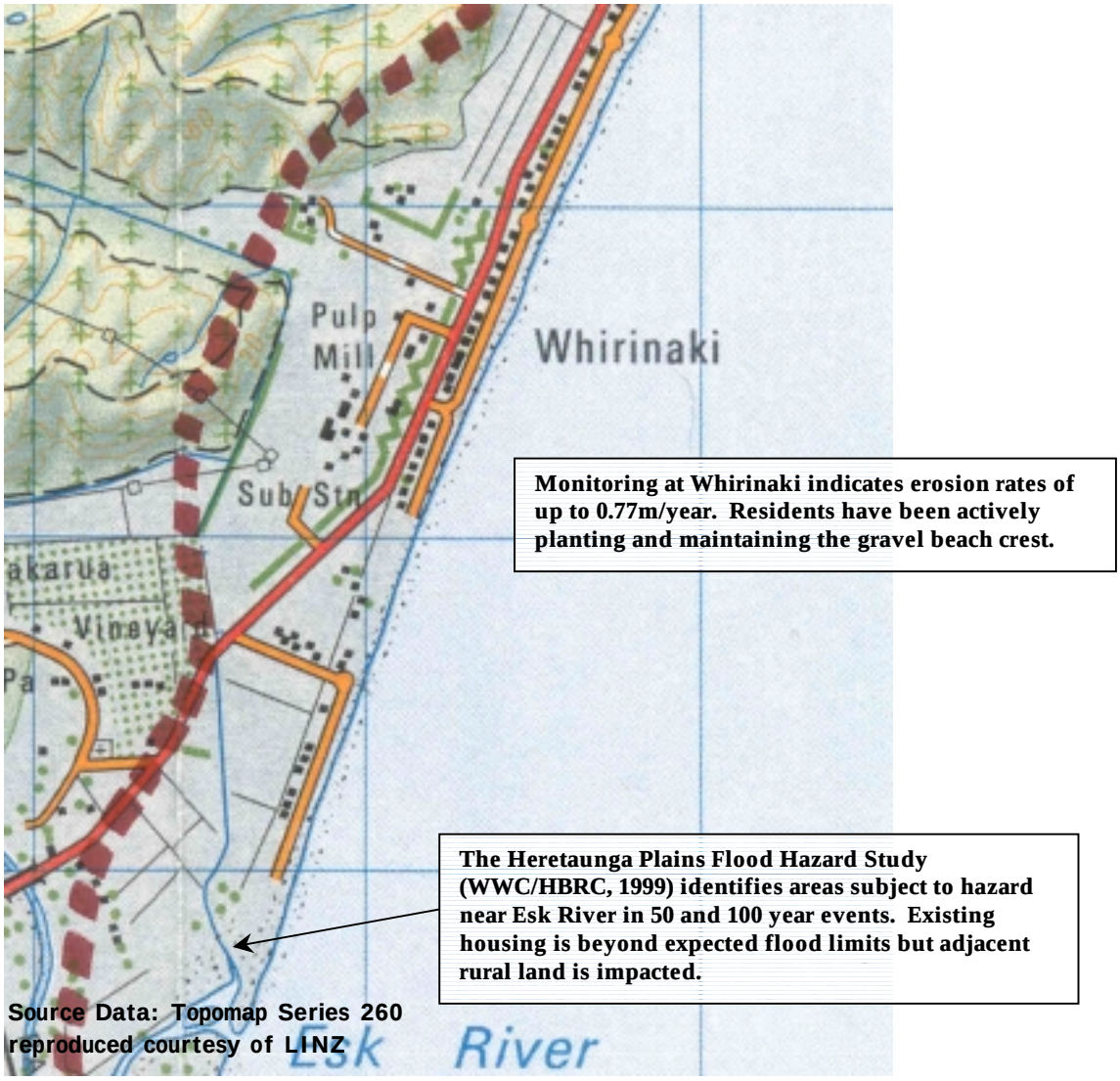
3.2. WAIPATIKI



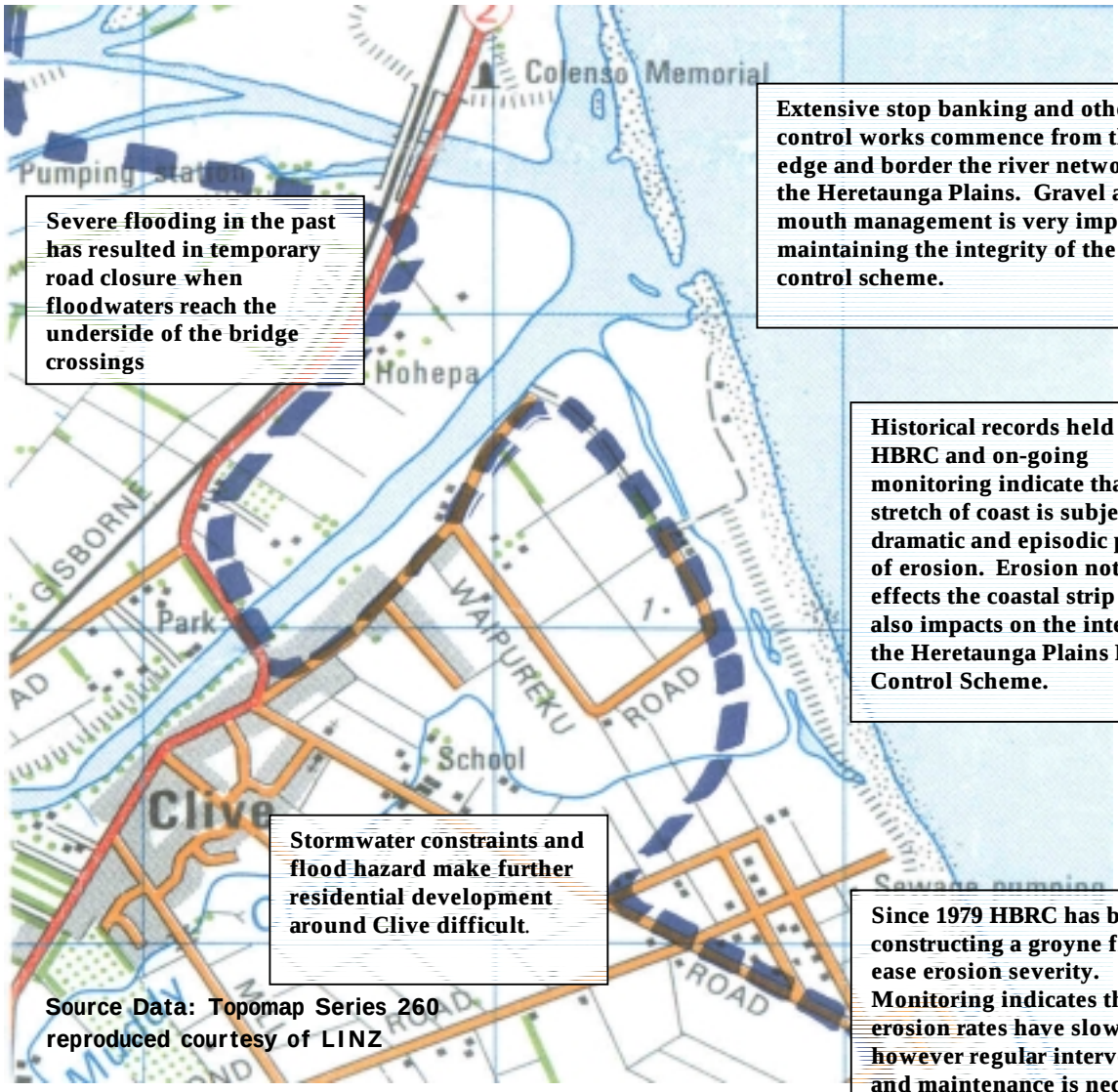
3.3. TANGOIO



3.4. WHIRINAKI



3.5. WAITANGI/NGARURORO AND CLIVE ENVIRONS



Severe flooding in the past has resulted in temporary road closure when floodwaters reach the underside of the bridge crossings

Extensive stop banking and other flood control works commence from the coastal edge and border the river network across the Heretaunga Plains. Gravel and river mouth management is very important for maintaining the integrity of the flood control scheme.

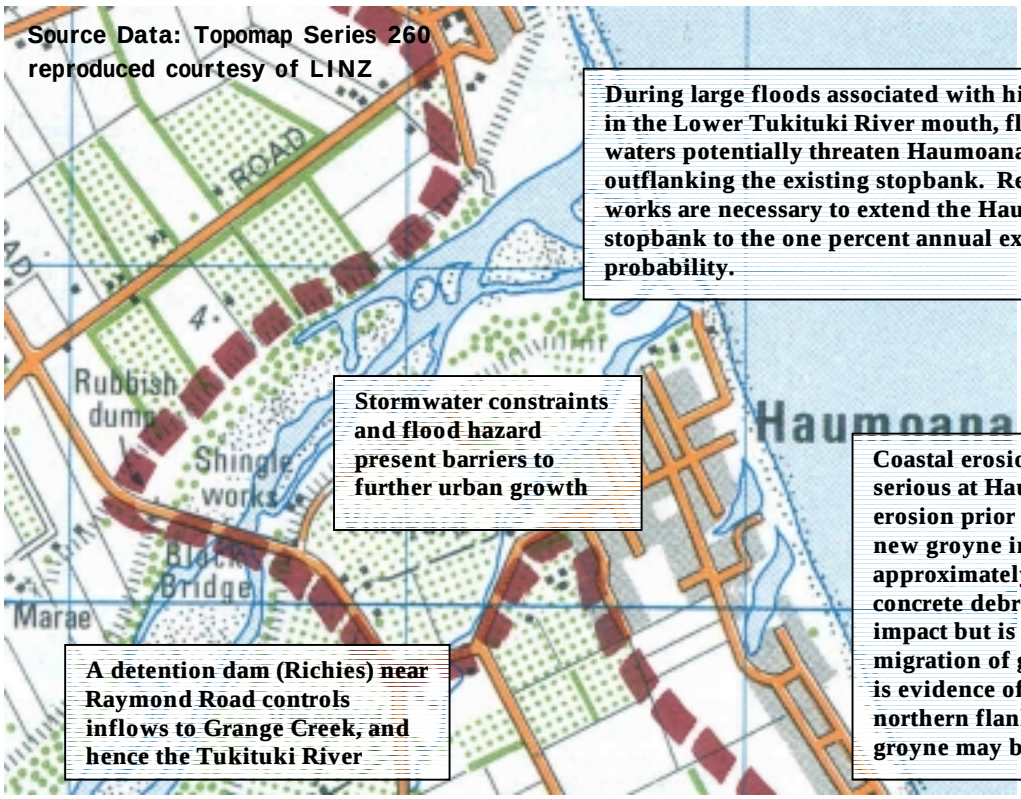
Historical records held by HBRC and on-going monitoring indicate that this stretch of coast is subject to dramatic and episodic periods of erosion. Erosion not only effects the coastal strip but also impacts on the integrity of the Heretaunga Plains Flood Control Scheme.

Stormwater constraints and flood hazard make further residential development around Clive difficult.

Since 1979 HBRC has been constructing a groyne field to ease erosion severity. Monitoring indicates that erosion rates have slowed however regular intervention and maintenance is necessary

Source Data: Topomap Series 260 reproduced courtesy of LINZ

3.6. HAUMOANA



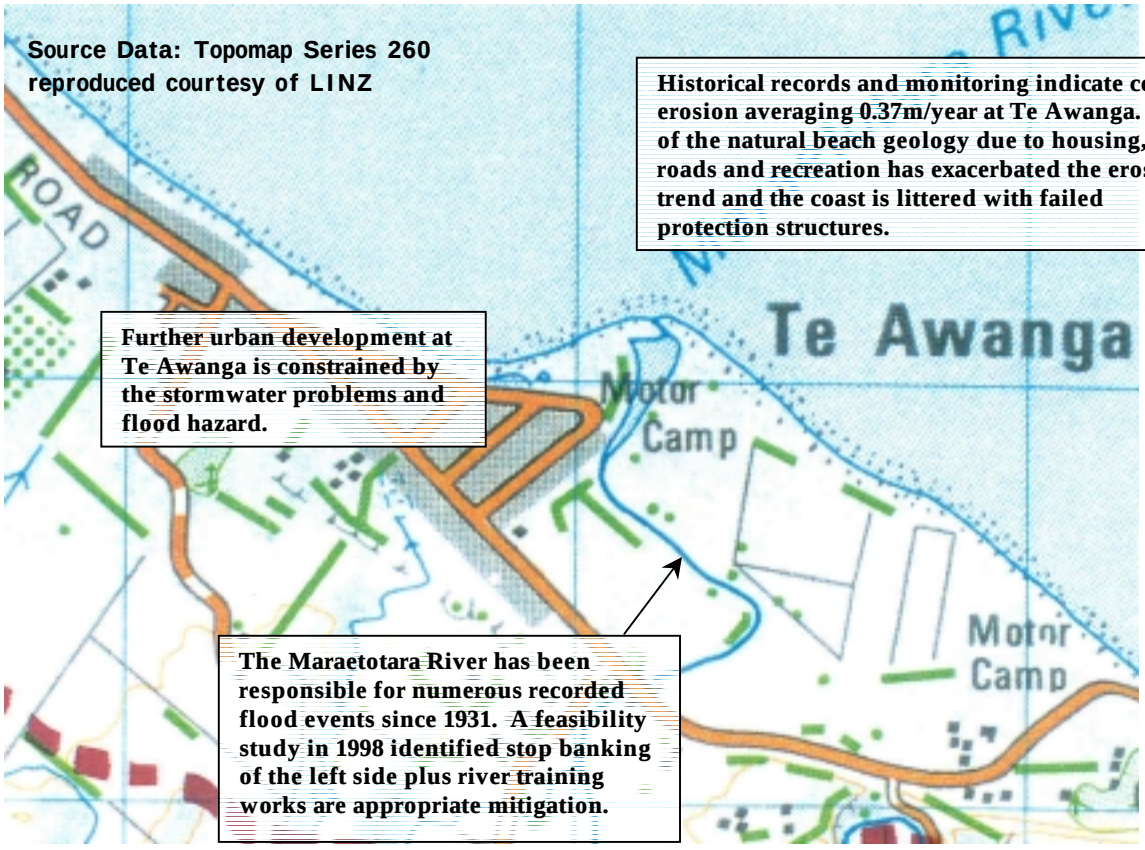
During large floods associated with high tides in the Lower Tukituki River mouth, flood waters potentially threaten Haumoana by outflanking the existing stopbank. Remedial works are necessary to extend the Haumoana stopbank to the one percent annual exceedance probability.

Stormwater constraints and flood hazard present barriers to further urban growth

Coastal erosion and inundation is serious at Haumoana. Rates of erosion prior to the installation of a new groyne in 1999 average approximately 0.4m/year. The concrete debri groyne has visual impact but is capturing northward migration of gravel. However, there is evidence of new scouring on its northern flank and at high tide the groyne may be overtopped.

A detention dam (Richies) near Raymond Road controls inflows to Grange Creek, and hence the Tukituki River

3.7. TE AWANGA

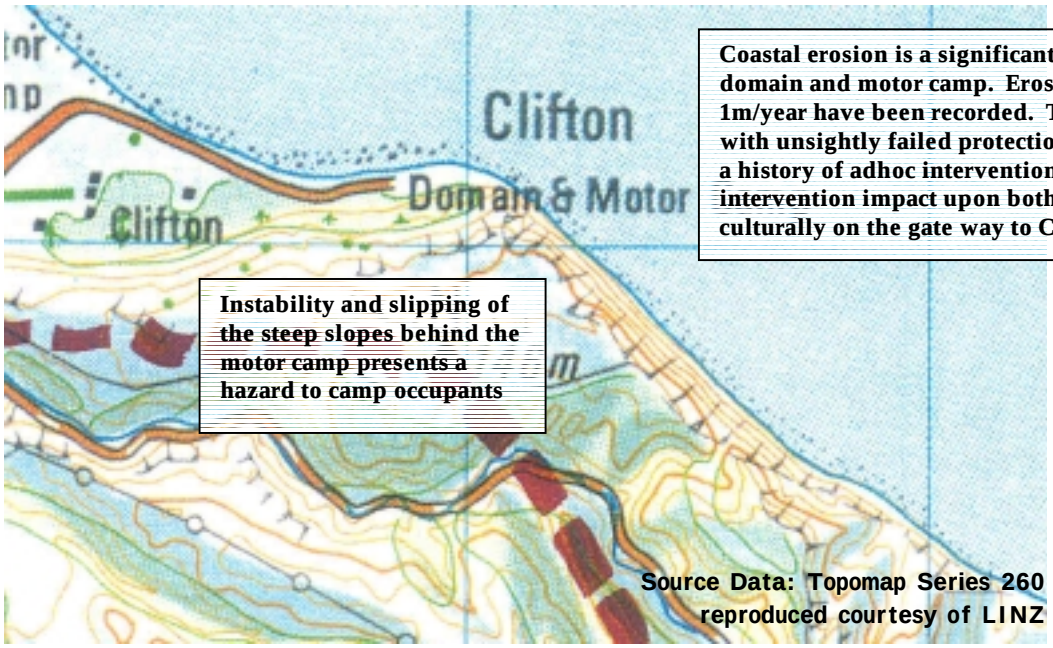


Historical records and monitoring indicate coastal erosion averaging 0.37m/year at Te Awanga. Loss of the natural beach geology due to housing, roads and recreation has exacerbated the erosive trend and the coast is littered with failed protection structures.

Further urban development at Te Awanga is constrained by the stormwater problems and flood hazard.

The Maraetotara River has been responsible for numerous recorded flood events since 1931. A feasibility study in 1998 identified stop banking of the left side plus river training works are appropriate mitigation.

3.8. CLIFTON

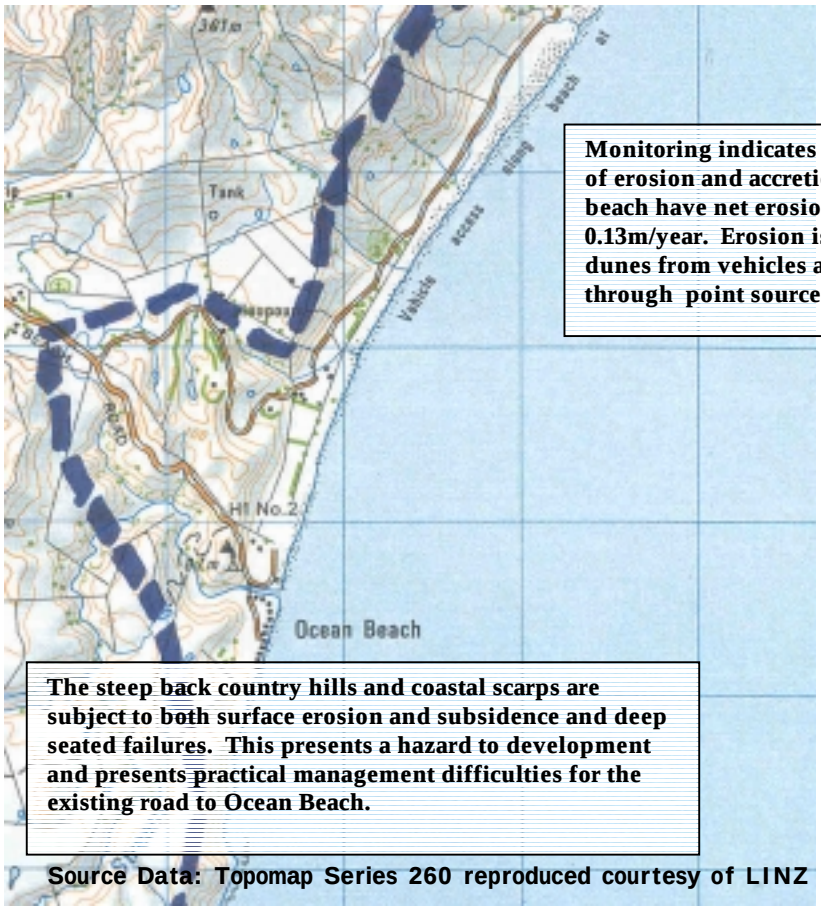


Coastal erosion is a significant problem for the domain and motor camp. Erosion rates of up to 1m/year have been recorded. The beach is littered with unsightly failed protection works and there is a history of adhoc intervention. Erosion and poor intervention impact upon both physically and culturally on the gate way to Cape Kidnappers.

Instability and slipping of the steep slopes behind the motor camp presents a hazard to camp occupants

Source Data: Topomap Series 260 reproduced courtesy of LINZ

3.9. OCEAN BEACH

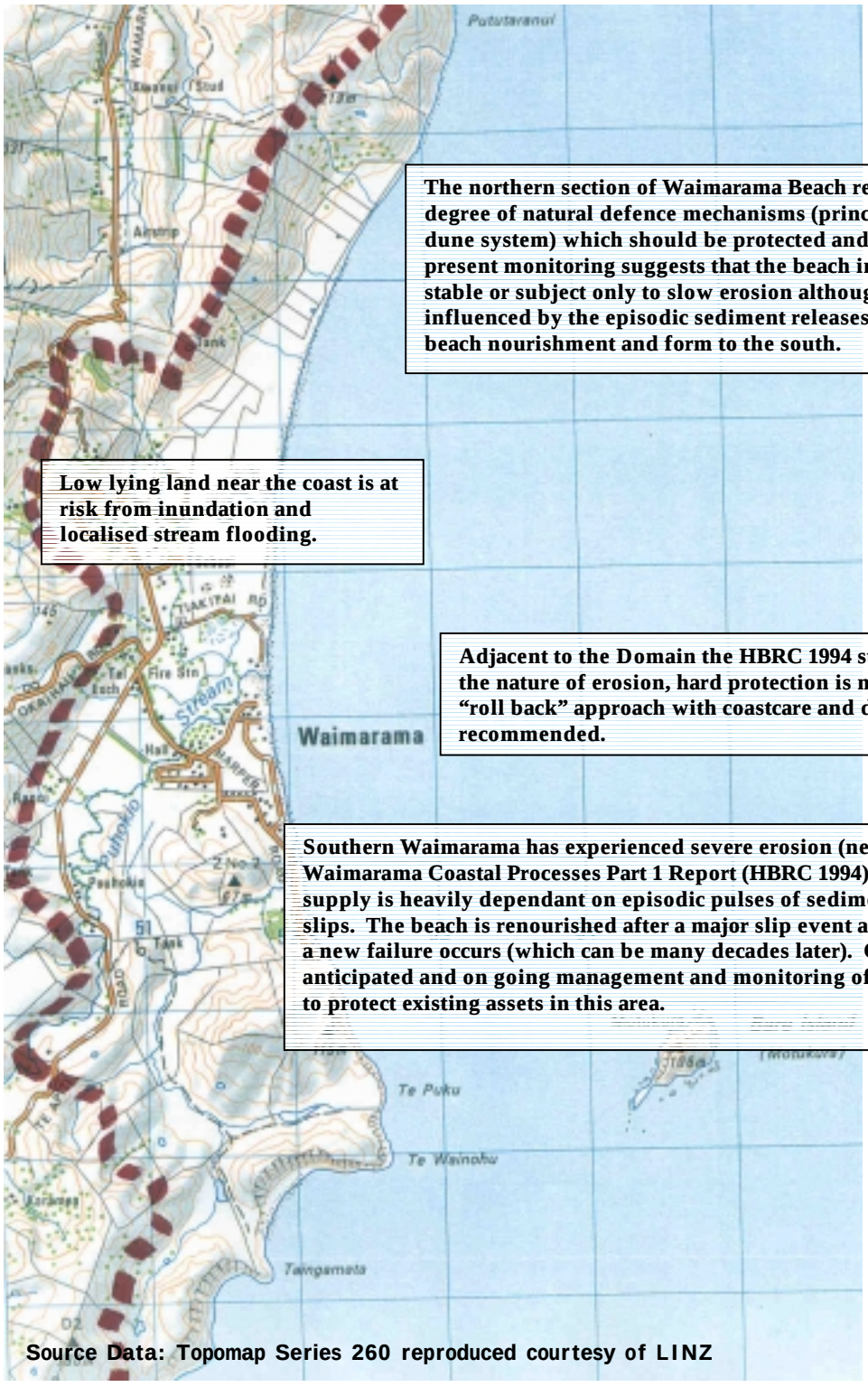


Monitoring indicates that Ocean Beach has episodes of erosion and accretion. Southern parts of the beach have net erosion rates of approximately 0.13m/year. Erosion is exacerbated by damage to dunes from vehicles and pedestrian traffic and through point source stormwater discharges.

The steep back country hills and coastal scarps are subject to both surface erosion and subsidence and deep seated failures. This presents a hazard to development and presents practical management difficulties for the existing road to Ocean Beach.

Source Data: Topomap Series 260 reproduced courtesy of LINZ

3.10. WAIMARAMA



The northern section of Waimarama Beach retains a reasonable degree of natural defence mechanisms (principally an adequate dune system) which should be protected and enhanced. At present monitoring suggests that the beach in this area is either stable or subject only to slow erosion although this area is still influenced by the episodic sediment releases which influence beach nourishment and form to the south.

Low lying land near the coast is at risk from inundation and localised stream flooding.

Adjacent to the Domain the HBRC 1994 study concludes that due to the nature of erosion, hard protection is not appropriate, rather a "roll back" approach with coastcare and dune enhancement is recommended.

Southern Waimarama has experienced severe erosion (net rates up to 0.85m/year).. The Waimarama Coastal Processes Part 1 Report (HBRC 1994) concludes that the beach sand supply is heavily dependant on episodic pulses of sediment generated by major coastal slips. The beach is renourished after a major slip event and then gradually erodes until a new failure occurs (which can be many decades later). Continued erosion must be anticipated and on going management and monitoring of the rip rap sea wall is essential to protect existing assets in this area.

3.11. SUMMARY OF LOCALITY SPECIFIC THREATS

The following is a summary of those threats which are considered to warrant a specific management response as part of the HCES.

Aropaoanui

- *flood hazard for low lying areas adjacent to the stream.*
- *erosion of hill country and sedimentation of streams due to land clearance and farming of marginal land.*

Waipatiki

- *flood hazard for low lying areas adjacent to the stream, including the access road and parts of the camping ground.*
- *damage to the natural dune system due to recreation and vehicles.*
- *erosion of hill country and sedimentation of streams due to land clearance and farming of marginal land.*

Whirinaki

- *coastal erosion.*
- *localised flood hazard close to the Esk River.*

Waitangi/Ngaruroro and Clive Environs

- *extensive flood hazard and the need to protect the integrity of both natural and man-made defences.*
- *coastal erosion and the associated impacts on the Heretaunga Plains Flood Control Scheme.*

Haumoana

- *flood hazard and the impacts of this hazard on future development potential.*
- *coastal erosion and inundation and the impacts of ad hoc intervention.*

(PAPS[10] identified these hazards as a high priority issue for the HCES)

Te Awanga

- *flood hazard from the Maraetotara River*
- *coastal erosion, loss of the natural defences and the impacts of ad hoc intervention*

(PAPS identified these hazards as a moderate priority issue for the HCES)

Clifton

- *coastal erosion and the impacts of ad hoc intervention*
- *instability and slipping of the steep slopes above the camping ground.*

(PAPS identified these hazards as a high priority issue for the HCES)

[10] *Priority Actions Paper, BCHF, December 1998*

Ocean Beach

- *potential for coastal erosion and the loss of and damage to natural defences, in particular the dune system.*
- *erosion and instability of the steep coastal slopes and back country and the impacts of such instability on the access road.*

(PAPS identified these hazards as a moderate to high priority issue for the HCES)

Waimarama

- *coastal erosion and inundation and the reliance on man-made protection in the south with natural defences threatened by landuses and recreation in the middle and northern sectors*
- *localised flood hazard near streams*

(PAPS identified erosion as a high priority issue for the HCES)

In addition to the above the following are hazards generic to the entire Hastings coast which must be considered in planning and management:

Tsunami due to local or distant sources, with the scale and intensity of impact dependant upon the severity of the seismic source, the distance from source and the local coastal and land ward topography of the area.

Land instability and erosion of steep hill country

General flooding of large sections of the Heretaunga Plains (as opposed to localised inundation) due to stopbank failure or overtopping in severe events.

Earthquake hazard and identification of areas prone to severe shaking or liquefaction.

4. STRATEGIC OBJECTIVES AND POLICIES

PAPS identified the following priority Strategic Issues associated with physical and coastal processes:

- *Erosion has the potential to impact on values and resources in the coastal environment, including land use and development, recreation values, tangata whenua values, and social and cultural values.*
- *Localised physical processes have the potential to adversely affect urban land use and residential activities in the coastal environment.*
- *Erosion mitigation needs to be regionally integrated; and*
- *The management of physical processes should firstly focus on the avoidance of risk.*

On the basis of the findings summarised in PAPS and consultation on this paper, the following strategic objective and policies for the management of coastal physical processes and hazards have been established[11]*:*

Objective - To ensure that all subdivision, use and development has regard to natural hazards and the need to maintain and enhance natural systems for protection.

Policies

1. **To avoid development in areas subject to natural hazards.**
2. **In areas where development has already taken place, to investigate measures to remedy or mitigate potential hazards, taking into account the value of the properties to be protected.**
3. **To ensure integration of coastal protection methods with natural and physical resources of the coastal environment.**
4. **To integrate monitoring programmes for the coastal environment.**

This strategic policy framework is used in section 5 to formulate a specific management strategy and desired outcomes for each of the locality specific threats identified in section 3 above.

[11] *Note that not all of these strategic policies will translate into District Plan provisions. Some lie beyond the ambit of RMA or have other legislative foundations. In addition they may be implemented by a variety of non-statutory methods.*

5. IMPLEMENTATION AND DESIRED MANAGEMENT OUTCOMES

On the basis of the above analysis and the available technical background information and monitoring records the following summarises the key management implementation strategies and outcomes sought for Erosion and Hazards in the Hastings coastal environment.

5.1. AREA SPECIFIC IMPLEMENTATION

Aropaoanui

- *Maintain and enhance the natural defence mechanisms of the beach, dunes and lagoon by introducing relatively informal measures (eg chain link gates at the end of the access road) to discourage vehicle access onto the dunes and beach.*

- *Encourage revegetation of steep hill country through land care schemes and assisting land owners with farm plans and by offering other incentives such as conservation lot subdivision.*

- *Avoid hazards by restricting the erection of buildings or structures within the sensitive dune area, the river flood plain or within a coastal hazard zone*[12]*.*

Waipatiki

- *Maintain and enhance the natural defence mechanisms of the beach, dunes and lagoon by introducing management measures (e.g. clearly defined car parks and beach access points and chain link gates at the end of the car park access road) to direct recreational visitors to appropriate access points and to prevent vehicle access onto the dunes and beach.*

- *Encourage revegetation of steep hill country through land care schemes and assisting land owners with farm plans and by offering other incentives such as conservation lot subdivision.*

- *Avoid hazards by restricting the erection of buildings or structures within the sensitive dune area, the river flood plain or within a Coastal Hazard Zone (CHZ).*

- *Upgrade the security and safety of Waipatiki road by developing a bridge over Waipatiki Stream above a reasonable flood level (say 5% AEP) and gradually upgrading the remainder of the road as funding permits.*

[12] *We recommend a CHZ be defined along the whole coast based on a predicted 100 year erosion rate plus 50m as a further contingency. Where adequate monitoring data is not available to confirm the required width, we recommend that a default width of 100m from MHWS be adopted as a precautionary measure. Any development proposal within the CHZ should not be permitted unless a site specific hazard evaluation is completed.*

Tangoio

- *Promote planned retreat of the existing bach settlement by restricting new dwellings along the coastal edge and establishing a baseline record of existing structures, then restrict anything more than maintenance or minor upgrading of existing baches so as not to prolong the reasonable building life of these baches.*

- *Discourage attempts at physical protection works and take enforcement and remediation action as necessary against any further illegal structures or works.*

Whirinaki

- *Avoid hazards by restricting the erection of new buildings or structures within a Coastal Hazard Zone (CHZ).*

- *Work with HBRC and local residents to promote a coast care approach to management of the natural defences including the gravel bank/dune system.*

- *Discourage attempts at physical protection works along the foreshore.*

- *Avoid future urban growth within flood hazard areas adjacent to the Esk River (refer Heretaunga Plains Flood Hazard Study 1999).*

Waitangi/Ngaruroro and Clive Environs

- *Work with HBRC and develop complementary District Plan policy and rules to maintain the integrity of the flood protection scheme.*

- *Monitor the effectiveness of the rules proposed in the PHDP for the Flooding RMU including minimum floor levels.*

- *Avoid hazards by restricting the erection of new buildings or structures within a Coastal Hazard Zone (CHZ).*

- *Lobby HBRC to ensure that coastal protection works (including the groyne field) are constructed and maintained in a manner consistent with the natural character, recreational and amenity values of the area and that their on-going effectiveness is carefully monitored.*

Haumoana

- *Work with HBRC and develop complementary District Plan policy and rules to maintain the integrity of the flood protection scheme.*

- *Promote schemes such as coast care groups to rehabilitate natural defence measures including the lagoons and coastal wetlands.*

- *Monitor the effectiveness of the rules proposed in the PHDP for the Haumoana Inundation RMU including minimum floor levels.*

- *Avoid hazards by restricting the erection of new buildings or structures within a Coastal Hazard Zone (CHZ).*

- *Promote planned retreat by preventing further coastal ribbon development and giving consideration to a "'Transferable Development Rights" policy from a donor area (the coastal edge) to a safer recipient area inland at Haumoana or elsewhere.*

- *Lobby HBRC to ensure that coastal protection works (including the groyne field) are constructed and maintained in a manner consistent with the natural character, recreational and amenity values of the area and that their on-going effectiveness is carefully monitored.*

Te Awanga

- *Promote schemes such as coast care groups to rehabilitate natural defence measures including the lagoons and coastal wetlands.*

- *Monitor the effectiveness of the rules proposed in the PHDP for the Flooding RMU including minimum floor levels.*

- *Avoid hazards by restricting the erection of new buildings or structures within a Coastal Hazard Zone (CHZ).*

- *Discourage attempts at physical protection works and take enforcement and remediation action as necessary against any further illegal structures or works.*

- *Lobby HBRC to prioritize the necessary flood mitigation works along the Maraetotara River.*

Clifton

- *Promote planned retreat by identifying safer areas suitable for staged relocation of the camping ground and roll back of the reserve and road access.*

- *Avoid hazards by restricting the erection of new buildings or structures within a Coastal Hazard Zone (CHZ).*

- *Discourage attempts at physical protection works which have had a significant adverse effect on natural character and the amenity of the gateway to Cape Kidnappers, and take enforcement and remediation action as necessary against any further illegal structures or works[13].*

Ocean Beach

- *Maintain and enhance the natural defence mechanisms of the beach and dunes by introducing management measures (eg clearly defined car parks and beach access points and chain link gates at the end of the car park access road) to direct recreational visitors to appropriate access points and to discourage vehicle access onto the dunes and beach.*

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[13] *This also applies to ad hoc intervention by public authorities who have used the coastal strip as somewhat of a dumping ground.*

- *Promote dune rehabilitation through retirement of areas and suitable planting (eg of Pingao).*

- *Encourage revegetation of steep hill country through land care schemes and assisting land owners with farm plans and by offering other incentives such as conservation lot subdivision.*

- *Avoid hazards by restricting the erection of new buildings or structures within a Coastal Hazard Zone (CHZ).*

- *Promote planned retreat of the existing bach settlement by restricting new dwellings along the coastal edge and identifying safer areas for relocation of baches or new development beyond the beach flats. .*

- *Discourage attempts at physical protection works and take enforcement and remediation action as necessary against any further illegal structures or works.*

Waimarama

- *Adopt the recommendations of the Waimarama Coastal Processes Study (HBRC, 1994) as a sound basis for erosion management. In particular the different approaches considered necessary for the four broad sections of beach (South, Domain, Domain to Puhokio Mouth and North of Puhokio).*

- *Maintain and enhance the natural defence mechanisms of the beach and dunes by introducing management measures (eg clearly defined car parks and beach access points and chain link gates at the end of the car park access roads) to direct recreational visitors to appropriate access points and to discourage vehicle access onto the dunes and beach.*

- *Promote dune rehabilitation through retirement of areas and suitable planting (eg of Pingao).*

- *Encourage revegetation of steep hill country through land care schemes and assisting land owners with farm plans and by offering other incentives such as conservation lot subdivision.*

- *Avoid hazards by restricting the erection of new buildings or structures within a Coastal Hazard Zone (CHZ).*

- *Promote planned retreat by preventing further coastal ribbon development and giving consideration to a "'Transferable Development Rights" policy from a donor area (the coastal edge) to a safer recipient area inland at Waimarama.*

- *Discourage attempts at ad hoc physical protection works and take enforcement and remediation action as necessary against any further illegal structures or works.*

- *Avoid further development in low lying areas close to streams*

5.2. OTHER GENERAL MEASURES

The following are additional implementation measures which are recommended for the entire coastal environment:

- *Adopt a pre-cautionary approach to development in the coast given the current lack of understanding of coastal processes and a lack of technical and monitoring data. If doubt exists regarding a potential hazard the onus must remain with a developer or proponent to demonstrate that a hazard is avoided, remedied or mitigated and that liability for damage is understood and accepted.*

- *In consultation with HBRC promote the adoption of a consistent and logical approach to assessing the various management options for coastal erosion hazard and determining if there is a justifiable need for physical intervention in the form of hard protection works. Through other coastal studies, BCHF has developed its own model for the steps involved and assessment of options associated with coastal hazard and a flow diagram highlighting the key steps in this suggested methodology is attached as Appendix 1 to this report. It is recommended that this be used as a basis for discussions with HBRC.*

- *Ensure stormwater from development and other point and non-point source discharges (eg septic tank field effluent) is carefully managed and does not contribute to localised erosion or damage to natural defences.*

- *Improve the understanding of coastal processes and trends by encouraging academic case studies in the Hawke's Bay and by maintaining and enhancing the existing beach monitoring programmes.*

- *Promote partnerships between public authorities and landowners and provide tangible assistance for land retirement, conservation management and coast care schemes.*

- *Investigate the best educational and promotional tools (including signage) for protecting dune systems and other natural defences from visitor interference and vehicle damage.*

6. SUMMARY: IMPLEMENTATION AND FUTURE WORK

The strategy parameters and suggested directions identified in this paper must be combined with findings from the PAPS and other technical papers to formulate an integrated strategy for coastal environmental management, land use planning, asset and infrastructural planning and investment and recreation planning. In addition to the implementation strategies identified in Section 5, the following general actions are also recommended:

- *that discussions and a working committee is established with the Hawke's Bay Regional Council to coordinate monitoring effort and coastal hazard mitigation studies and projects.*

- *that area specific Strategy and Structure Plans be prepared for the preferred growth areas at Waipatiki, Whirinaki, Te Awanga and Waimarama. A central premise for preparation of these plans should be that hazards in new residential areas should be avoided and natural defences protected. Physical intervention to remedy a hazard should not be necessary in new growth areas if siting and design is carefully considered at Structure Plan stage.*

APPENDIX 1

BCHF Suggested Coastal Erosion Hazard Assessment Methodology

BCHF Suggested Coastal Erosion Hazard Assessment Methodology

(note – for information only, section references refer to other studies, not this report)