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Committee Environment Committee
Author Paul Denton, Policy Advisor and Juliet Milne, Team Leader

Broad-scale survey of sandy beaches and river estuaries along the Wairarapa coast

1. Purpose

To report the results of a survey of the Wairarapa's coastal and estuarine habitats, incorporating broad-scale mapping of substrate and vegetation, risk assessment and monitoring recommendations.

2. Background

This is the third coastal habitat mapping survey and risk assessment undertaken in the Wellington region. Previous habitat mapping surveys were undertaken in 2004 for the Wellington Harbour and South Coast (see Report No. 04.320), and in 2005 for the sandy beaches and river estuaries on the Kapiti Coast, Plimmerton, Titahi Bay, and Makara Estuary (see Report No. 06.83).

This is the first time that a comprehensive ecological study has been undertaken for the entire Wairarapa coastline. Other studies have only concentrated on very small areas of one or more estuaries or dune formations.

The habitat surveys are designed to fill a gap in our ecological understanding of coastal and marine biodiversity. The results of the surveys are being used for consents assessments and policy development because habitat information can be used to indicate the organisms likely to be present in certain areas, and the sensitivity of different areas to pressures.

Information from the Wairarapa coastal survey – and the two previous coastal habitat surveys – is also being used to assist with the preparation of a coastal monitoring strategy for the entire Wellington region. The Environmental Monitoring and Investigations Department will be drafting this strategy over the next six months.

3. Survey methods

Wriggle Coastal Management Ltd were contracted to undertake a broad-scale survey of the types of substrate (e.g., firm sand, soft sand, mud, gravel) and vegetation (e.g., grasses, duneland, exotic weeds) present along the entire Wairarapa coastline from Owahanga Estuary (just north of Greater Wellington's regional boundary) to Baring Head on the Wainuiomata coast (217 km length). Data for the survey were collected during December 2006 when the whole of the Wairarapa coastline was visited over a two to three week period. Habitat cover was recorded onto laminated aerial photographs and subsequently digitised and entered into a GIS framework. Information was also gathered on the various uses and values of the coastal areas (e.g., swimming, shellfish collection, natural character) and the likely pressures present (e.g., erosion, nutrient enrichment, grazing, climate change). This information was later used to determine a "vulnerability rating" ('low', 'moderate' or 'high') for each estuary or beach, derived by assessing its existing condition (health) and its susceptibility to adverse effects (e.g., sedimentation, eutrophication, habitat loss).

The Wairarapa survey produced:

- Coastal habitat maps which are an Arcmap GIS data set that depicts current substrate and vegetation cover types using aerial photography and ground truthing techniques.
- An assessment of the vulnerability of the coastline habitats based on the sensitivity of the receiving environments, human uses, and the upstream catchment area risk factors associated with each section of the coast.
- Monitoring recommendations for the Wairarapa coastline.

4. Survey findings

The mapping and risk assessment study identified an exposed and rugged coastline backed by erosion-prone, soft sedimentary rock and primarily grassland catchments except for the southern section where some hard rock catchments appear and scrub and forest become the dominant vegetation cover. The soft rock catchments and absence of scrub or forest cover cause high sediment runoff to the estuaries and coast (north of Tora and in Palliser Bay). Erosion of cliffs, duneland and grassland are also evident along many sections of the coast.

4.1 Habitats identified

The study identified a wide range of coastal shoreline habitats including:

- Rocky shores (121 km of the 217 km long coastline): primarily soft sedimentary rock platform reefs and turbid water to the north and hard boulder and rockfield shores to the south. Each rock type has its own biological diversity.

- Beaches (107 km): primarily broad, flat, sandy beaches with white sand and wide surf zones to the north (bathed by cloudy waters) which progressively change towards the south to moderately steep beaches, coarser grained sands to very steep beaches (no surf zone) and clear waters. Biodiversity is greatest in the least harsh environments to the north.
- Dunes (104 km): tend to be very thin or absent, dominated by marram grass and grazed by stock. Only in Cape Palliser are there areas dominated by native duneland species. Biodiversity is greatest in these areas.
- Estuaries: The Wairarapa coast has 14 moderate sized estuaries, including 12 river mouth lagoon estuaries, one shallow coastal estuary (Lake Onoke) and one tidal river estuary (Whareama Estuary). There are also a further 60-70 very small estuaries, predominantly river mouth lagoon (hāpua) estuaries. Because of the exposure to high seas the estuaries tend to regularly block up, especially in the summer months. The lagoons tend to be small with saline water intrusion extending only a few hundred metres upstream or not at all. Tidal flats are rare or absent and biodiversity is generally low. In addition, such estuaries are extremely susceptible to water and sediment quality degradation during periods of mouth restriction. However in high flows the mouths unlock and are flushed clean.
- Hinterland (inland of beaches and estuaries): landward of the coastline the predominant land use is extensive grassland farming of sheep and cattle (75% cover) with areas of exotic forestry and scrub (17% cover). The catchment of Lake Onoke is the only one that differs from this pattern with more intensive farming including dairying.

4.2 Vulnerability assessment

The major issues in terms of the vulnerability of coastal habitats were identified as –

- Climate change: loss of habitat and biodiversity from sea level rise. This will lead to removal or inland migration of sea-cliffs, shingle beaches, sandy shores and salt marsh habitats due to enhanced erosion.
- Coastal erosion: soft rock areas north of Tora are particularly susceptible to loss of dunes, beaches and cliff habitat.
- Estuary water and sediment quality: threat to water quality from land use intensification (e.g., Lake Onoke).
- Invasion of marram grass: this species over-stabilises sand dunes and results in the reduction of sand released to the foreshore during storm events.

Despite these issues, the majority of the Wairarapa coastal habitats rated in the ‘low’ or ‘low to moderate’ classes for ecological vulnerability.

4.3 Monitoring recommendations

The contractor, Wriggle Coastal Management Ltd, recommended a long term coastal monitoring programme for the Wairarapa coast. The programme should:

- Monitor the major stressors leading to degradation of estuaries, including major land use change, every five years.
- Monitor the long-term condition of Lake Onoke. This lake receives significant inputs of sediment, nutrients and pathogens and is susceptible to ecological deterioration.
- Monitor the long-term condition (benthic fauna and sediment quality) in representative Wairarapa estuaries with the highest biodiversity (e.g., Whareama Estuary).
- Measure the presence of marram grass and other invasive weed species.
- Measure the reduction in duneland through sea level rise, erosion, grazing and property development.
- Establish one long-term monitoring site for dissipative beach types (most species rich) between Castlepoint and Whakataki River to assess any reduction in biodiversity through climate change.
- Establish one long-term monitoring site in both soft rock substrate (i.e., Flat Point) and hard rock substrate (i.e., Cape Palliser) to assess any reduction in biodiversity through climate change.

5. Next steps

Implementation of the above monitoring recommendations is currently being investigated, alongside other coastal monitoring priorities in the Wellington region (e.g., mapping of seagrass and eelgrass cover in Porirua Harbour). A synoptic survey and risk analysis of Lake Onoke to identify appropriate monitoring and management options is planned for 2007/2008.

6. Communication

Copies of Wriggle Coastal Management's technical report, *Wairarapa Coastal Habitats: Mapping, Risk Assessment and Monitoring*, will be distributed to all district councils in the Wairarapa, the Department of Conservation and local iwi. Copies are also available from Greater Wellington's library and website.

7. Recommendations

That the Committee:

1. ***Receives the report.***
2. ***Notes the contents.***

Report prepared by:

Paul Denton
Policy Advisor

Report prepared by:

Juliet Milne
Team Leader, Environmental
Science

Report approved by:

Murray McLea
Acting Manager,
Environmental Policy

Report approved by:

Nigel Corry
Divisional Manager,
Environment Management