

7. CHRISTCHURCH DUNES – MANAGEMENT AND THE JOINT CCC/CRC STUDY

BACKGROUND

In 1995 Christchurch City Council was granted consent for artificial adjustments and re-contouring of the dune profiles along the Christchurch coastline. This provides a basis for much of the work that 'CoastCare' is currently undertaking. Consent was granted subject to a number of conditions relating to dune shape and sand volumes, including a requirement that dunes shall not be lowered to a height of less than eight metres above Mean Sea Level (approximately 5m above the road level). This height and associated volume was calculated as that required to provide adequate protection against dune failure and run-up from extreme waves during storms. These estimates were based on the limited data that existed at the time. They were accepted by the independent Commissioner and acknowledged as being the best available; however it was recommended that consideration be given to further data collection and investigation. There was potential for a review of minimum dune height standards.

RECENT STUDY

Recently an investigation concerning the appropriate dune height, shape and, more importantly, sand volume required to provide adequate protection from large coastal storms was completed. While various existing sites were studied the issue of most concern related to dunes that needed to be re-contoured. This study was undertaken by independent consultants (National Institute of Water and Atmospheric Research and Tonkin and Taylor Ltd.) and overseen by Canterbury Regional Council and City Council CoastCare staff. This co-operative project was resourced by way of a cost share system, with approximately 60% of costs met by Christchurch City Council, with the remaining 40% covered by the Regional Council. Selection of consultants was subject to the C.R.C. tendering process.

This investigation, completed in June 1998, was separated into three distinct parts. The first (Part A) consisted of an examination and technical reviews of a number of methodologies frequently employed to model and explain erosion of sand dunes during storms. The objective of this part of the study was to find the best method for the type of beaches and sea conditions we have along the Christchurch coast. The system chosen is an American software package (SBEACH) that is used in many parts of the world. It is worth noting that SBEACH has just been used in a similar study along the Queensland coast. The second part (Part B) provides detailed information on potential storm wave heights and sea levels, including extreme tides, storm surge, and other effects that occur in Pegasus Bay. The final stage of the investigation (Part C) uses data formulated in the second part to run the computer model chosen as a consequence of the review undertaken in the first part of the study.

KEY STUDY CONCLUSIONS

- Due to higher energy storm waves arriving at North New Brighton from all wave approach directions, dune erosion and volume losses will be the greatest along this area for any size storm event.
- For re-contoured dunes to an 8m crest elevation, maximum wave run-ups are not predicted to reach the dune crest.
- Maximum run-up elevations are predicted to exceed a 6m dune crest at North New Brighton, during storm conditions that have a 1 in 50 chance of being equalled or exceeded in any given year. A 6m dune in New Brighton would be over-topped during storm conditions that have a 1 in 100 chance of being equalled or exceeded in any given year.

- For dunes re-contoured to a 6m crest elevation, the position of the resulting dune scarp face after a storm that has a 1 in 100 chance of occurring in any given year, is predicted to be located approximately 10m further landward than on a 8m dune.
- Of the current dune sites analysed in this study, wave overtopping was predicted to occur at: Taylors Mistake; the dunes adjacent to Effingham Street; and the vehicle access tracks at South Brighton Surf Club and Spencer Park, during storm conditions that have a 1 in 100 chance of being equalled or exceeded in any given year.
- At the seawalls by Hawke Street and Bowhill Street, overtopping could occur during storm conditions that have a 1 in 10 chance of occurring in any given year.
- Regardless of dune profile, all Christchurch City Council CoastCare plantings and works carried out below the 4m (MSL) contour are likely to need to be replaced on approximately a ten-yearly basis.

INFORMATION DISSEMINATION

Dr. Willem de Lange from the Coastal Marine Group, University of Waikato, peer reviewed each part of the study. These independent reviews support the approach the study took and its outcomes. The study results were summarised in a report and presentation to the C.R.C. Environmental Monitoring Committee and to the Burwood/Pegasus Community Board. Numerous individuals and concerned groups have been given copies of the reports and there has been various correspondence and meetings explaining the reports and the Regional Council's role in this issue.

CONCLUSION

The recent study represents significant progress in the knowledge base that is used for the sustainable management of the Christchurch coastline. The results are of particular relevance for the mitigation of coastal hazards. The Regional Council has the responsibility, in conjunction with Christchurch City Council, to avoid and mitigate natural hazards. Consideration of hazards is important in all coastal management decisions hence a precautionary approach has to be taken towards re-shaping the dunes. The current resource consent and the commendable efforts of CoastCare mean that public amenity and access to the coast is being enhanced in a structured way.

Wholesale lowering of natural sand dunes is inappropriate and contrary to the policy documents (N.Z. Coastal Policy Statement, Regional Policy Statement and Proposed Christchurch District Plan) and legislation (Resource Management Act 1991) under which both Councils operate.

The co-operation between Councils is very positive and promotes a more integrated approach towards coastal issues.

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Chairman's

Recommendation: For discussion.