

9. STORM UPDATE

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The purpose of this report is to update the Board on the impacts of the series of storms, from August 2001 to February 2002, on the Christchurch coastal environment.

THE WINTER OF 2001

The five year period prior to August 2001, saw significant amounts of sand coming ashore on the Christchurch beaches and the consequent build up of sand in considerable volumes on our dunes and in our sand trapping systems, installed along the coast from Waimairi beach to South Brighton beach. The winter period from August 2001 through to October 2001 however saw three periods of storm waves combined with enhanced tides which removed large amounts of sand from these beaches. The sand trapping fences which had effectively trapped significant amounts of sand for the past four to five years were eventually undermined in a number of areas by the onslaught, as sand was removed due to storm demand.

The tactical use of sand binder plantings and cloth sand fencing has proved very successful in capturing and storing sand on the beach front to build up beach profiles, develop small foredunes in front of the main dune system and prevent sand movement to the rear of the dune. They protected both existing vegetation on the front slope of the dune and stopped sand movement through low areas such as beach access tracks, at Surf Clubs and the car parks at central New Brighton. The light weight sand fencing design was never intended to withstand wave action and were always considered by staff as an occasionally expendable tool employed to gain the benefits of total sand management in between the 'relatively' rare storm events. No significant detrimental impacts were caused by the storms to any previously recontoured dunes profiles. Large scarp faces were however cut into the more exposed, and unbuffered, dune frontslopes north of Spencer Park.

The repeated onslaught of high tides and off-shore storm generated waves during the winter of 2001 had the potential to impact with major damage on the Christchurch coastal dune system. While large volumes of sand were removed and beach levels lowered dramatically, discussion with ECAN coastal scientists supports my assertion that significant damage to the main dune system was clearly reduced by the sand trapping/storm buffering project implemented over the past few years by the Coast Care programme.

THE SUMMER OF 2001/2002

Over the past summer the Christchurch coast reclaimed some of its sand volumes with general sand levels being raised again. The New Brighton main beach frontage was left for several months without sand control after winter. Photographic records showed a unacceptably large movement of sand over walls, into the car parks and onto the roadsides beyond. In the process this sand movement smothered stable dune vegetation behind the location of the previous sand fences. The result was the necessity to use heavy machinery to remove the excess sand from in front of the car parks. Sand fencing was reinstalled at New Brighton in front of the north and south car parks and a small buffer dune reformed. The significant effect of the fences was to stop large amounts of sand blowing into the car parks and beyond, which had started reoccurring immediately after the fences were removed.

Discussions with the North New Brighton Residents' Association and some members of the Coastal Image Group prior to summer resulted in a trial arrangement not to reinstate sand fencing and accumulate sand as a buffer at North Brighton beach. The desire was to artificially maintain a flat sand beach space back to the seawall by mechanical clearance in the Surf Club/Hall area.

Waitangi Day 2002 may have been calmer in the North this year but the strong southerlies generated by a slow moving deep depression to the east of the South Island resulted in an unexpectedly stormy period for the Wellington and East Coast of the South Island. Pegasus Bay experienced 48 hours of large storm force waves at the same time as having a period of higher tides, which were enhanced further by the low air pressure. This resulted in considerable sand loss and the continued erosion of sand from the toe of dunes in the New Brighton and North Brighton areas. The Christchurch beaches and dunes, between South Brighton and Bottle Lake again have a cut along their frontage of over a metre in height as they suffered the loss in excess of all the sand build up which had occurred in the six months since the major storms of last winter.

A large volume of drift wood and logs also accompanied the storm event and covered the beaches at New Brighton and North Brighton. Some fast work was required by Coastal Ranger staff to clean up the beaches prior to the Tip Top Big Beach Dig to be held at North Brighton three days later, which attracted thousands of participants. New Brighton beach had sections of sand trapping fencing undermined but all materials were recovered and removed by staff within 36 hours. At North Brighton the seawall foundations were exposed and sand and drift wood deposited around the surf club buildings and out on the road side car parks.

My assertion that the damage was greater at North Brighton than at New Brighton, and of its continued greater vulnerability due to a lack of any storm buffer through responsible sand management, will no doubt be debated but it won't stop me suggesting it!

SAND FENCING

Staff will be immediately reinstating sand trapping measures at central New Brighton to ensure that sand does not leave the beach and cause problems around car parks, buildings and facilities. Our intention is to ensure that the build-up of sand, which is blown inshore by the north-easterly winds, stays on the beach as a storm buffer but also does not get into the public facilities and amenities which the community is seeking to promote as a high value visitor destination. Sand control, at all times and particularly after storm events, remains a key element of enhancing and maintaining New Brighton's image. If we are to maintain tidy car parks and control sand movement then sand fencing and sand stabilisation planting will have to be an on-going feature of the New Brighton beach foreshore. No replacement of sand fencing at other sites will be considered until after the vulnerable winter period is passed.

Discussions with the North Beach community which resulted in an agreement not to replace the sand fence across the main North Beach beach frontage, from the hall to the surf club, has developed into a trial of various sand trapping techniques at North Brighton. Staff and the community will be jointly monitoring the sand movement over the next few years to assess the effectiveness of the options methods.

One of the arguments against the use of sand fencing was the supposed cost of construction. I would suggest that no matter what we do there will be costs and there is not an option to do nothing! The issue is what do we achieve from those costs and how long do the benefits last. This summer, without installing sand fencing, costs were still incurred at North Brighton when machines and labourers were used to remove the wind blown sand build-up against the seawall, to prevent sand smothering the gardens behind it. The costs of this option will be monitored and reported on in the future. The choice to maintain a low flat beach has also necessarily excluded any ability to build up a sand buffer in front of the area to protect it from future storm impacts and possibly far greater costs.

The cost of sand trapping fences, as compared to regular mechanical sand removal, has been the debated. Presently Coast Care has sufficient numbers of second hand posts available at no cost. Virtually all the posts were recovered from the previous fences and therefore there is no purchase cost to consider. Today's fencing costs then include windcloth, wire, hardware and installation at approximately \$4.50 per metre, or \$1,800 for 400 metres. This includes contract post driving and 'work scheme' or 'P.D.' labour costs to construct the fence. It does not include park ranger supervision time as this would occur what ever method of sand control was chosen. Some mechanical management of the sand build-up around sand fences where there is a height restriction in place, such as at North Brighton and New Brighton, is also required. This can be as much as \$3-4000 per year. Mechanical sand management by heavy machinery now runs at a cost of \$80 to \$100 per hour with transportation costs extra.

The straight costs of sand fencing, as opposed to mechanical sand removal, can not be simply compared as they do not both achieve the same results. Prior to the Coast Care programme changing the sand management regime at New Brighton and North Brighton a loader was required to clear sand away from the seawalls on a fortnightly basis. It is estimated that at today's costs and in a dry and windy year, unlike this year, that it would cost at least \$1000 per month, or \$6000 per year to maintain those 400 metres as flat sand beaches.

Sand fencing on the other hand has a one-off cost but the effects of which last for several years (hopefully!). It provides twenty four hour sand trapping so that the sand always stays on the beach where it is wanted and doesn't allow it to impact on high value amenity areas behind. It enables a storm buffer to be developed which can ultimately be planted out with sand binders and stabilised into a new foredune or occasionally removed by machinery in a managed way. With sand fencing in place in front of the New Brighton car parks over the past few years there was virtually no sand getting blown onto them and they hardly ever required cleaning, and then only by shovel and barrow.

An awareness of the real costs and risks being undertaken is essential in any management choice. Excess sand removal may provide an increased area of open flat recreational sand but immediately the machine departs then the sand starts to blow back inland and smoother any obstruction in its path. This means that car parks, walls, gardens, lawns and dune vegetation will quickly begin to be covered again. This results in subsequent and unquantified extra maintenance and landscape replacement costs off the beach as well as on it. Also fundamentally and most crucial is the fact that mechanical sand removal cannot produce or sustain a stable dune buffer and basically prevents practical storm buffering being developed. Total reliance is being placed on an old stone wall, which has failed in the past.

The basic fact of not having any form of storm buffering in front of North Brighton, when it has been done so simply and effectively with sand for the past few years means that the facilities and assets at North Brighton may possibly be at increased risk of inundation than they were with the minimal buffer protection previously in place over the past few years. This is obviously only a potential, and as yet unknown, future cost but it is clearly brought about by an increased risk which some in the community are willing for us all to undertake.

Chairperson's

Recommendation: That the information be received.