

The vegetation pattern across the mudflats of the Sandspit area, Manawatu Estuary, New Zealand

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Introduction

The vegetation of the Manawatu River mouth is an important site for wading and coastal birds. It also is one of the largest areas of pristine estuarine vegetation in New Zealand. The sandspit mudflats are one of the most natural of the vegetation types present, yet are readily accessible by all visitors to the estuary. This report assesses the vegetation gradient pattern across the mudflat between the sandspit and the town of Foxton Beach, an area which is strongly influenced by tides and deposition of mud.

Methods

A 40m long transect was run at an angle of 154 degrees magnetic from the bollards across the mudflat into the area normally covered at high tides (Fig 1). Every 2 metres along the transect a 50 x 50cm quadrat was placed, and local shoot frequency recorded for all species. This involved counting the presence of plant shoot material in each of the 25 subsquares of the grid. Changes in topography along the transect were plotted using a surveyor's level (Fig. 2). Data were graphed and species' distributions interpreted relative to the topography.

Figure 1: The Sandspit area, Foxton, and location of the transect line (in yellow).



Figure 2: The transect line. Note location of line (with 40m mark at base of bollard) in relation to other signs.



Results

The transect line changed in height by 18 cm being lower at the mudflat end (Fig 3). The topography was steeper in the vegetated portion. No plant species were found in the lower 13 m of the transect.

In the upper portion of the transect, a total of 13 species were recorded, 6 of them exotic species (i.e. not native to New Zealand). The most common species were *Selliera radicans* (sea primrose) and *Isolepis cernua* (slender club sedge). *Samolus repens* (half star) and *Sarcocornia quinqueflora* (glasswort) were frequent in the upper end of the transect, but occurred at higher elevations than the most common species. Along the vegetated portion of the transect was a mixture of less frequent species. All exotic species were found in low frequency and at the upper end of the transect.

Figure 3 - Overleaf: The transect line's topography and related changes in frequency of plant species.

Discussion

The mudflats by the bollards show a marked vegetation gradient on the mudflat side of the bollards, the other side being too disturbed by vehicles for reliable sampling. That gradient is strongly related to periodicity of high tides, with the lower portion of the transect covered by every high tide. Thus the area is not suitable for plant growth, with 100% cover of mud, though it is occupied by tunnelling mud crabs, *Helice crassa*.

The upper portions of the transect, closer to the bollards, show increasing presence of vegetation, with the most salt-tolerant species, sea primrose, occurring closest to the tidal zone and lowest on the transect. Less salt-tolerant species occur closer to the bollards, where they are covered only by spring tides. Such species cannot survive regular covering by tides.

The area has six exotic species (sharp rush, *Juncus acutus*; saltmarsh grass, *Puccinellia stricta*; batchelor's buttons, *Cotula coronopifolia*; sweet clover, *Melilotus officinalis*; and toad rush, *Juncus bufonius*). These are found only at the upper end of the transect, being only partly salt-tolerant. Although these species are not common, they are starting to interfere with the natural successional processes of the estuary, where the vegetation changes over time to be more like vegetation of areas not exposed to tides.

No plant species were present five years previously along the area of the transect line, and they have only appeared recently, presumably in response to the mudflat filling in with sediment from the river. Their nature and distribution will probably continue to change as the mudflats infill. The transect will be worth monitoring on a regular basis to track these changes.

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