Gaining New Ground: *Thinopyrum junceiforme,* A Model of Success Along the South Eastern Australian Coastline.

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Abstract

Thinopyrum junceiforme or Sea wheat-grass is a rhizomatous perennial grass native to Europe. In Australia, this invasive alien plant has colonised the coast in three south eastern states: Tasmania, Victoria, and South Australia. The very first specimen of *T. junceiforme* was collected from Victoria nearly 90 years ago, and was probably initially accidentally introduced via ballast. Sand stabilisation trials may have assisted in the spread of the plant locally, however, drift card and bottle studies indicate a number of potential pathways for the dispersal of the plant between the south eastern Australian states. *T. junceiforme* does not have the status of some introduced plants such as Marram grass, however, current awareness of the plant is greater than originally thought and it is predominantly perceived in a negative light due to its potential impacts on shorebirds, native vegetation and coastal geomorphology and beach-dune processes.

Thinopyrum junceiforme demonstrates the ability to disperse both by seed and by rhizome fragments. Its ability to delay germination while floating and the capacity of seeds to germinate well subsequent to prolonged immersion is interpreted as a significant advantage to *T. junceiforme's* survival and spread. The presence of multi-noded rhizome fragments and seasonal conditions may influence the regenerative capacity of rhizomes, but ultimately catastrophic erosional events may affect its ability to establish on some parts of the coast. Beach replenishment activities have replicated the fragmentation process that facilitates dispersal and overcomes bud dormancy under natural conditions.

Thinopyrum junceiforme has become established along much of the length of the Younghusband Peninsula. The rapidity of its colonisation at approximately 18.571 ha/yr far exceeds the rate of Marram grass colonisation (1.875 ha/yr) on Stewart Island, New Zealand. By virtue of its presence this alien coastal grass has altered the vegetation composition of the peninsula, and the native grass *Spinifex sericeus* is no longer the primary coloniser along this part of the coast. *T. junceiforme* has also modified the dune environment by colonising pre-existing dunes as well as forming new dunes seaward of the established foredunes on the barrier. Consequently, *T. junceiforme* has impacted on the ecology and the geomorphology of the Younghusband Peninsula and may be classed as one of only a small group of invasive species designated as 'transformer' species.

Declaration

I, Kristine Faye James, certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide.

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