NOMINATION NO. 312
ITEM NO. T9611

FLORA AND FAUNA GUARANTEE - SCIENTIFIC ADVISORY COMMITTEE

FINAL RECOMMENDATION ON A NOMINATION FOR LISTING

Introduction and spread of Spartina to Victorian estuarine environments.

(Potentially Threatening Process)

Date of receipt of the nomination: 21 January 1994 **File No.:** 94/0633
Date of preliminary recommendation: 16 May 1995
Date of final recommendation: 1 February 1996

Validity:

The nomination is for a valid item and the prescribed information was provided.
In the opinion of the SAC the process is adequately defined and described.

The nominated process is the deliberate or accidental introduction of *Spartina* (Rice or Cord grass) into Victorian estuarine environments. *Spartina* is an erect halophytic grass which colonises intertidal areas of lagoons and estuaries. It requires tidal inundation and forms a pioneer plant community between low and high tide mark. It occurs across a wide range of substrates and has the ability to colonise previously unvegetated mudflats as well as saltmarsh and mangrove communities. It appears that two species of *Spartina* currently occur in Victoria; the sterile *S. townsendii* and the fertile *S. anglica*. All *Spartina* species can reproduce vegetatively from rhizomal material. *S. anglica* is able to produce viable seed and can be distributed widely by water.

Spartina was introduced to Australia in the 1920 and 1930s because of its values for shoreline protection and land recolonisation and its possible use as pasture (Boston 1992). It was planted extensively throughout Australia, although it has only successfully established in Victoria, South Australia, New South Wales and Tasmania.

Spartina is well known for its ability to trap and bind large volumes of fine sediments (Thompson 1991). The species has the ability and potential to invade vast tracts of intertidal, saltmarsh and seagrass communities. Changes to habitat characteristics such as habitat structure and flow patterns have the potential to adversely affect flora and fauna which occupy these areas.

The range of flora or fauna affected or potentially affected was adequately stated in the nomination.

Significance of the threat which the potentially threatening process poses or has the potential to pose was adequately stated in the nomination.

Eligibility for listing as a potentially threatening process under the Flora and Fauna Guarantee

The nominated item satisfies at least one criterion of the set of criteria prepared and maintained under Section 11 of the *Flora and Fauna Guarantee Act* 1988, and stated in Schedule 1 of the Flora and Fauna Guarantee Regulations 1991.

Evidence that criteria are satisfied:

Criterion 5.1 *The potentially threatening process, in the absence of appropriate management, poses or has the potential to pose a significant threat to the survival of a range of flora or fauna.*

Evidence:

Spartina occurs in most embayments in Victoria, including Western Port Bay (Bass River, Moodies Creek, San Remo), Andersons Inlet, Shallow Inlet, Corner Inlet and the estuaries of Franklin, Agnes, Albert and Barwon Rivers. In 1981, the total area of *Spartina* in Victoria was estimated to be approximately 89 hectares (Boston 1981). It is believed that *Spartina* has spread substantially since this time, with a significant proportion of Andersons Inlet infested. There is some evidence that stands of *Spartina* have lower overall densities of benthic fauna (Boston 1981, Millard and Evans 1984, Gray *et al.* 1991). It is possible that some invertebrates cannot construct burrows because of the high interstitial water content of mud within *Spartina*, and high silt content and overlying water may decrease filtration (Millard and Evans 1984).

Spartina can encroach on wading bird feeding grounds, taking over either seagrass, algae or invertebrate-rich mudflats, making invertebrates less available. It is possible that flocking behaviour could be affected because of

restrictions to the birds' ability to land and move on the ground. The ability of *Spartina* to accumulate sediments has the potential to steepen the intertidal profile which may increase bird crowding and decrease feeding time and food intake. Infestations of *Spartina* may alter the suitability and thus availability of roosting sites for birds.
Spartina may invade natural seagrass beds, possibly causing direct blanketting or accelerating accretion of sediments to raise the beds to levels no longer suitable for seagrass (Boston 1981).

Sub-criterion 5.1.1 *The potentially threatening process, in the absence of appropriate management, poses or has the potential to pose a significant threat to the survival of two or more taxa.*

Evidence:

Studies in Britain have shown a connection between increases in *Spartina* and decreases in wader numbers in some estuaries (Davies and Moss 1984, Gray *et al.* 1991). Many intertidal wader species frequent estuaries in Victoria where *Spartina* occurs. A total of 17 species listed under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA) have been recorded in Andersons Inlet (ANCA 1992). The Eastern Curlew *Numenius madagascariensis* which occurs in Andersons Inlet and Western Port is considered "rare" in Victoria (CNR 1995, in press). The Hooded Plover *Charadrius rubicollis*, which is classified as "vulnerable" in Victoria and is listed under the *Flora and Fauna Guarantee Act* 1988 breeds in Shallow Inlet.

Sub-criterion 5.1.2 *The potentially threatening process, in the absence of appropriate management, poses or has the potential to pose a significant threat to the survival of a community.*

Evidence:

Several small patches of *Spartina* exist within the intertidal zone of the San Remo Marine Community, which is listed under the *Flora and Fauna Guarantee Act* 1988.

Background Information

- Carr *et al.* (1992) list *Spartina* as an environmental weed in Victoria, and note that it is a very serious threat to one or more vegetation formations in the state.
- CNR has been conducting laboratory and field trials to investigate chemical control of *Spartina*. Other possible methods of control include physical removal, covering infestations with black plastic and biological control. An Australasian conference "How Green is Your Mudflat?" dealing with the spread and control of *Spartina* in Australia was held in Victoria in 1995.

Advertisement for public comment

In accordance with the requirements of Section 14 of the *Flora and Fauna Guarantee Act* 1988, the preliminary recommendation was advertised for a period of at least 30 days.

Th preliminary recommendation was advertised in:

"The Age" - on 22 November 1995
"The Weekly Times" - on 22 November 1995
The Government Gazette - on 23 November 1995

Submissions closed 29 December 1995.

Further evidence provided:

No public comments were received by the Scientific Advisory Committee.
No evidence was provided to warrant a review of the Scientific Advisory Committee's preliminary recommendation that the potentially threatening process is eligible for listing.

Documentation

The published information and research data provided to the SAC have been assessed. To the best of their knowledge, the SAC believes that the data presented are not the subject of scientific dispute and the inferences drawn are reasonable and well supported.

Final Recommendation of the Scientific Advisory Committee

The Scientific Advisory Committee concludes that on the evidence available the nominated item is eligible for listing in accordance with Section 11 of the Act because primary criterion 5.1 is satisfied.
The SAC also concludes that sub-criteria 5.1.1 and 5.1.2 have been satisfied and that no evidence exists to suggest that primary criterion 5.1 cannot be satisfied as a consequence of sub-criteria 5.1.1. and 5.1.2 being satisfied.

The Scientific Advisory Committee recommends that the nominated item be supported for listing on Schedule 3 of the *Flora and Fauna Guarantee Act* 1988.

Selected references:

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Gray, A. J., Marshall, D. F. & Raybould, A. F. (1991) *A century of evolution in* Spartina anglica. **In**: Advances in Ecological Research 21 [Ed. Begon, M., Fitter, A. H. & Macfayden, A.] Academic Press, London.

Harrison, I., Rogers, J., Smith, G. & Woodfull, J. (1990) *Andersons Inlet - Resources, issues and options for management.* Graduate School of Environmental Science. Monash Unviversity, Melbourne.

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Millars, A. V. & Evans, P. R. (1984) *Colonisation of mudflats by* Spartina anglica*: Some effects on invertebrate and shorebird populations at Lindisfarne.* **In**: A report of a meeting held in Liverpool University on 10 November 1982. [Ed. Doody, P.].

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Prichard, G. (1992) *Control of* Spartina *with herbicides.* **In**: The sea has weeds too! Proceedings on a conference on the problem of *Spartina* held from 10 May to 12 May 1991, Inverloch, Victoria. [Ed. Frazer-Quick, G. & Phillips, A.].

Thompson, J. D. (1991) The biology of an invasive plant - What makes *Spartina anglica* so successful? *Bioscience* **41(6)**.

Vanderzee, M. (1992) *The biology of* Spartina. **In**: The sea has weeds too! Proceedings on a conference on the problem of *Spartina* held from 10 May to 12 May 1991, Inverloch, Victoria. [Ed. Frazer-Quick, G. & Phillips, A.].

Endorsement by the Convenor of the Scientific Advisory Committee **Date**

12 March 1996

Malcolm Calder

Dr. Malcolm Calder
Convenor