Australian Government
Department of the Environment, Water, Heritage and the Arts

Key Threatening Process Nomination Form - For adding a threatening process under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

Section 1 - Name and Description

Conservation Theme

1. The conservation themes for the assessment period commencing 1 October 2010 (for which nominations close 25 March 2010) are **'heathlands and mallee woodlands', and 'terrestrial, estuarine and near–shore environments of Australia's coast'.**

*How does this nomination relate to the **conservation themes**?*

The nominated KTP is consistent with one of the conservation themes: invasion by *Lophopyrum ponticum* (Tall Wheat Grass) threatens ecological communities – in particular Upper Coastal Saltmarsh communities – and numerous species that constitute 'terrestrial, estuarine and near-shore environments of Australia's coast'.

Name

2. *Name of nominated threatening process. The name should accurately reflect the scope of the process based on the description and evidence provided in this form.*

Ecosystem degradation, habitat loss and species decline due to invasion in southern Australia by introduced Tall Wheat Grass (*Lophopyrum ponticum*).

Description

***3**. Description of the threatening process that distinguishes it from any other threatening process, by reference to:*
(i) its biological and non-biological components;
(ii) the processes by which those components interact (if known).

Description of Tall Wheat Grass (*Lophopyrum ponticum*): *L. ponticum* is a robust, densely tufted perennial grass growing to 2.2m high (Walsh & Entwisle 1994). Native to the Balkans, Black Sea, Asia Minor and southern Russia, *L. ponticum* is a halophyte that grows in saline meadows, marshes and on coasts in its native range. It was first introduced to Australia in 1935 for reclamation of saline soils. The most widely planted cultivar – 'Dundas' – was released in 1999 by the Victorian Government. During the past decade its use as a pasture grass for saline areas has been heavily promoted and subsidised in southern Australia under the National Action Plan for Salinity and Water Quality. This has resulted in a very high propagule pressure, particularly in Western Victoria (Booth et al. 2009).

Naturalisation & invasion: In a relatively short time, *L. ponticum* has become one of the most seriously invasive grass species in temperate Australia (Booth et al. 2009). Map 1 (page 12) documents known sites of naturalisation in Victoria. It has also naturalised in South Australia, NSW, Western Australia and Tasmania, although the extent has not been documented (Booth et al. 2009, Virtue & Melland 2003, Weiss & Iaconis 2001). The distribution and age structure of invading populations indicate that it is rapidly recruiting and expanding its range (G. Carr, pers. comm.). The Future Farm Industries CRC has recently assessed the weed risk of *L. ponticum* for Victoria as 'very high' and for other states (NSW, SA, WA) as 'high' (Byrne & Stone 2009). Climate modeling found its potential range in Victoria exceeded 10 million hectares (Weiss & Iaconis 2001). The total invasive range may be considerably larger because it has naturalised in locations far removed from its modeled climate envelope (comparing Map 1 with ibid). No climate modeling is available for other states. In South

Australia, one risk assessment found that 25% of native vegetation of the South-east region was at risk of invasion (Virtue & Melland 2003). Observations in South Australia indicate that *L. ponticum* is widespread and an extremely serious invader (G. Carr unpubl. data; Mark Bachmann, pers. comm.). This is particularly the case in the Coorong (a Ramsar wetland and a system under severe pressure), where *L. ponticum* is now widespread and abundant in many locations, and on Kangaroo Island, where it occupies diverse environments (saline and non-saline).

Amongst many invasive species threats in south-eastern Australia *L. ponticum* stands out as having an extremely wide ecological amplitude across temperate lowlands. It is tolerant of salinity, alkalinity, drought, frost and waterlogging, and is invading the following range of habitats:

- Coastal and non-coastal upper and mid-level saltmarshes
- Plains Grasslands on basalt-derived soils
- Coastal cliffs and coastal calcareous sands
- Salt Paperbark (*Melaleuca halmaturorum*) Swamp Scrub
- Grey Box (*Eucalyptus microcarpa*) Grassy Forest on stony clay loam
- River Red Gum (*E. camaldulensis*) Grassy Forest on clay loam and on deep siliceous sands (the latter with Porcupine Grass *Triodia scariosa*)
- Seasonal and permanent wetlands, brackish wetlands, estuaries and non-saline wetlands (including Brackish Sedgeland and Brackish Wetland)
- Mallee Chenopod Woodland on calcareous sandy loam, Kangaroo Island
- Riparian woodlands
- Exotic vegetation of road reserves in a very wide range of saline, brackish and non-saline environments

The extreme versatility and hardiness of Tall Wheat Grass, and its capacity to invade and dominate a range of very sensitive environments – saltmarshes, wetlands and grasslands – render it an invader of particular concern.

Threats to ecological communities: As a stress-tolerant halophyte and glycophyte, *L. ponticum* forms dense monospecific swards in naturally saline and non-saline areas. This is the reason it has been heavily promoted as a pasture grass – to extend productive uses onto saline areas (eg. see Borg & Fairbairn 2003). *L. ponticum* is currently the most serious invasive weed of upper and mid-level saltmarshes in both coastal and inland areas in southeastern Australia, and could result in almost complete elimination of these ecological communities in many areas (Victorian Saltmarsh Study Group 2009, Booth et al. 2009, Weiss & Iaconis 2001).

L. ponticum is also a serious threat for saline and subsaline wetlands, including numerous Ramsar-listed sites (Carr et al. 1992; Carr et al. in prep.). It also threatens estuaries, riparian environments and grasslands in southeastern Australia.

L. ponticum shifts the floristic composition of ecological communities by outcompeting and eliminating structurally subordinate native plant species and preventing recruitment of all species; it eliminates and degrades faunal habitats and alters ecosystem functions associated with fire and potentially also with hydrology and nutrient cycling.

With Government promotion of *L. ponticum,* propagule pressure has substantially increased during the past decade, and as many sites of naturalisation and invasion are only recent developments, this weed has the potential to invade a much larger area. The area vulnerable to invasion in Victoria alone probably exceeds the 10 million hectares modeled by Weiss & Iaconis (2001) as naturalised populations have been discovered outside the modeled climate envelope both latitudinally and altitudinally.

Threat to species: The flora of naturally saline areas has been little studied and includes several endemic species with small distributions that are highly vulnerable to weed invasion. *L. ponticum* is invading the habitat of numerous rare and threatened species, including 12 species listed under the EPBC Act (Booth et al. 2009). It forms tall, dense swards that shade out subordinate species and prevent the recruitment of all other species.

Fire: Because *L ponticum* grows tall and dense, forming closed stands, *L. ponticum* substantially increases fuel loads in many invaded areas, and may alter fire behaviour and long-term fire regimes. Some vegetation types not subject to natural burning, such as shrublands dominated by *Tecticornia,* are becoming vulnerable to fire as a consequence of invasion (ibid).

Note that other perennial exotic grass species promoted under salinity programs are also invading

natural areas in southern Australia. Other species of concern include *Festuca arundinacea, Phalaris aquatica*, and *Puccinellia ciliata* (Victorian Saltmarsh Study Group 2009, Booth et al. 2009). However, we regard *L. ponticum* as the most serious of these threats because of its very robust life form, exceedingly wide ecological amplitude and the evidence of its threats to date. There are likely to be releases of new cultivars of these species in future bred for greater drought or salinity tolerance that could exacerbate their threats.

The major focus on *L. ponticum* has been in Victoria, where its propagule pressure has been strongest due to its promotion as a pasture species and where the data on its impacts are most comprehensive. However, the same threatening process will operate in other parts of southern Australia over a longer timescale as naturalisations increasingly occur.

Section 2 - Impacts on Native Species and Ecological Communities

Non-EPBC Act Listed Species/Ecological Communities

***4**. Provide a summary of those species or ecological communities, other than those that are listed under the EPBC Act, that could become eligible for listing in any category, other than conservation dependent. Please include:*

a. For each species: the scientific name, common name (if appropriate), category it could become eligible for listing in;
b. For each ecological community: the complete title (published or otherwise generally accepted), category it could become eligible for listing in.

Species/Ecological Community	**Category**
Upper Coastal Saltmarsh communities (see description section 5)	Vulnerable-endangered
Lachnagrostis billardierei ssp. b*illardierei* (Coast Blown-grass)	Vulnerable
*Lawrencia spicata (*Salt Lawrencia)	Vulnerable
Limonium australe (Yellow sea-lavender)	Vulnerable
Melaleuca halmaturorum ssp. *Halmaturorum* (Salt Paperbark)	Vulnerable
Poa physoclina (Tussock-grass)	Critically endangered
Prasophyllum anticum (Pretty Hill Leek-orchid)	Endangered
Prasophyllum viretrum (Orford Leek-orchid)	Critically endangered
Teucrium albicaule (Scurfy Germander)	Vulnerable
Candalides neolkeri (Goldenrayed Blue Butterfly)	Vulnerable

***5.** Provide justification that the species or ecological communities detailed at question 3 could become eligible for listing in any category, other than conservation dependent. For each species/ecological community please include:*

a. data on the current status in relation to the criteria for listing;
b. specific information on how the threatening process threatens this species/community;
c. information on the extent to which the threat could change the status of the species/community in relation to the criteria for listing.

Upper Coastal Saltmarsh communities (see description below)	Victorian Saltmarsh Study Group (2009), Booth et al. (2009), Carr (unpubl.)	*L. ponticum* has the potential to eliminate upper saltmarsh communities in many areas, particularly Western Victoria, by becoming the dominant species.
Lachnagrostis billardierei ssp*. billardierei*	Victorian Saltmarsh Study Group (2009), Carr (unpubl.)	Based on IUCN criteria, this species is endangered in Victoria. *L. ponticum* is an imminent serious threat. Its upper saltmarsh habitat would be vulnerable to *L. ponticum* invasion in other parts of its range, but data is lacking.
Lawrencia spicata	Victorian Saltmarsh Study Group (2009), Crowfoot et al. (2006), Carr (unpubl.)	Based on IUCN criteria, this species is critically endangered in Victoria, with *L. ponticum* a major threat. Its upper saltmarsh habitat would be vulnerable to *L. ponticum* invasion in other parts of its range, but data is lacking.
Limonium australe	Victorian Saltmarsh Study Group (2009), Crowfoot et al. (2006)	Based on IUCN criteria, this species is critically endangered in Victoria, with *L. ponticum* a major threat. Its upper saltmarsh habitat would be vulnerable to *L. ponticum* invasion in other parts of its range, but data is lacking.
Melaleuca	Victorian Saltmarsh	Based on IUCN criteria, this species is critically

halmaturorum ssp. *halmaturorum*	Study Group (2009), Carr (unpubl.)	endangered in Victoria, with *L. ponticum* a major threat. Its upper saltmarsh habitat would be vulnerable to *L. ponticum* invasion in other parts of its range, but data is lacking.
Poa physoclina	Walsh (2008)	Based on IUCN criteria, this species is critically endangered. 5 known populations. Inhabits the margins of salt lakes or seasonal wetlands. Major threat is encroachment by *L. ponticum* and *Phalaris aquaticia*. Without management of *L. ponticum*, all populations are likely to go extinct.
Prasophyllum anticum	D. Pitts (pers. comm.)	1 known population. Without management of *L. ponticum* this population could go extinct.
Prasophyllum viretrum	D. Pitts (pers. comm.)	4 known populations. *L. ponticum* is a serious emerging threat.
Teucrium albicaule	Carr (unpubl.)	Based on IUCN criteria, this species is critically endangered in Victoria. Its saltmarsh habitat would be vulnerable to *L. ponticum* invasion in other parts of its range, but data is lacking.
Candalides neolkeri	N. Reiter (pers. comm.)	4 known populations. Its habitat is severely threatened by *L. ponticum*.

The Victorian Saltmarsh Survey (2009) has recommended that the current Ecological Vegetation Community (EVC) 9 'Coastal Saltmarsh Aggregate' be split into 7 different EVCs. Invasion by *L. ponticum* is a threat to upper saltmarsh communities (not lower saltmarshes), including the following components:

- Seasonally Inundated Sub-saline Herbland (*Wilsonia humilus* Herbland)
- Seasonally Inundated Sab-saline Herbland (*Wilsonia rotundifolia* Herbland)
- Seasonally Inundated Sub-saline Herbland (*Wilsonia backhousei* Herbland)
- Brackish Wetland
- Brackish Herbland
- Estuarine Scrub (Western Victoria)
- Brackish Lignum Swamp
- Brackish Sedgeland (*Baumea juncea*)
- Brackish Sedgeland (*Gahnia trifida*)
- Brackish Grassland
- Estuarine Flats Grassland (*Poa poiformis – Ficinia nodosa*)
- Estuarine Flats Grassland (*Austrostipa stipoides – F. nodosa – P. poiformis*)
- Coastal Saline Grassland (*Distichlis distichopylla* Grassland)
- Coastal Saline Grassland (*Sporobolus virginicus* Grassland)
- Coastal Dry Saltmarsh (*Sarcocornia blackiana* Herbland)
- Coastal Dry Saltmarsh (Annual Herbland)
- Coastal Dry Saltmarsh (*Frankenia pauciflora* Shrubland)
- Coastal Dry Saltmarsh (*Disphyma crassifolium* Herbland)
- Coastal Hypersaline Saltmarsh (*Tecticornia pergranulata* Shrubland)
- Coastal Hypersaline Saltmarsh (*Tecticornia halocnemoides* Shrubland)
- Coastal Hypersaline Saltmarsh (*Lawrencia squamata* Shrubland)
- Coastal Tussock Saltmarsh (*Gahnia flium* Sedgeland)
- Coastal Tussock Saltmarsh (*Austrostipa stipoides* Grassland)
- Saltmarsh-grass Swamp (*Puccinellia stricta* Grassland)

EPBC Act Listed Species/Ecological Communities

6. *Provide a summary of those listed threatened species or ecological communities that, due to the impacts of the threatening process, could become eligible for listing in another category representing a higher degree of endangerment. Please include:*

a. For each species: the scientific name, common name (if appropriate), category it could become eligible for listing in;
d. For each ecological community: the complete title (published or otherwise generally accepted), category it could become eligible for listing in.

Species/Ecological Community	**Category**
Poa sallacrustis (Salt-lake Tussock-grass) *Prasophyllum diversiflorum* (Gorae Leek-orchid) *Senecio psilocarpus* (Swamp Fireweed) *Trichanthodium baracchianum* (Dwarf Yellow-head)	Critically endangered Critically endangered Endangered Critically endangered

7. *Provide justification that the species or ecological communities detailed at question 6 could become eligible for listing in another category representing a higher degree of endangerment due to the impacts of the threatening process. Please include:*

a. data on the current status in relation to the criteria for listing (at least one criterion for the current listed category has been previously met);
b. specific information on how the threatening process significantly threatens this species/community;
e. information on the extent to which the threat could change the status of the species/community in relation to the criteria for listing. This does not have to be the same criterion under which the species/community was previously listed.

Poa sallacrustis	Carter & Walsh (2006b), McRobert & Carr (2008), DSE (2008).	9 populations covering 800m^2. Weed invasion is the major threat, with *L. ponticum* the most serious invader. Unless *L. ponticum* is controlled, all populations are likely to be lost.
Prasophyllum diversiflorum	Carr (unpubl.), D. Pitts (pers. comm.)	2 populations. *L. ponticum* has invaded near one population & is a very serious threat.
Senecio psilocarpus	Carr (unpubl.)	About 25 populations. *L. ponticum* is a serious potential threat.
Trichanthodium baracchianum	N. Reiger (pers. comm.)	8 wild populations, on the periphery of saline flats. *L. ponticum* has invaded some sites & will destroy all populations in time unless managed.

8. *Provide a summary of those species or ecological communities, listed as threatened under the EPBC Act, that are considered to be adversely affected by the threatening process. Please include:*

f. For species: the scientific name, common name (if appropriate) and category of listing under the EPBC Act;
g. For ecological communities: the complete title (exactly as listed) and category of listing under the EPBC Act.

Natural Temperate Grassland of the Victorian Volcanic Plain		Critically endangered
Grassy Eucalypt Woodland of the Victorian Volcanic Plain		Critically endangered
Carex tasmanica	Curly Sedge	Vulnerable
Cullen parvum	Small Scurf-pea	Endangered
Glycine latrobeana	Clover Glycine	Vulnerable
Lachnagrostis adamsonii	Adamson's Blown-grass	Endangered
Lepidium aschersonii	Spiny Peppercress	Vulnerable
Pimelea spinescens ssp. *spinescens*	Spiny Rice-flower	Critically endangered
Poa saltacrustis	Salt-lake Tussock-grass	Vulnerable
Prasophyllum diversiflorum	Gorae Leek-orchid	Endangered
Senecio psilocarpus	Swamp Fireweed	Vulnerable
Trichanthodium baracchianum	Dwarf Yellow-head	Vulnerable
Xerochrysum palustre	Swamp Everlasting	Vulnerable
Neophema chrysogaster	Orange-bellied Parrot	Endangered

9. *Provide justification that the species or ecological communities detailed at question 8 are affected adversely by the threatening process.*

Natural Temperate Grassland of the Victorian Volcanic Plain	*L. ponticum* is currently rare in this community but based on current evidence it will emerge as a significant threat.
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	*L. ponticum* is a very serious threat.
Carex tasmanica	Weed invasion is the "greatest threat" (Carter 2010). *L. ponticum* is identified as a "serious problem" in the recovery plan.
Glycine latrobeana	L. ponticum is a very serious invader of its grassy woodland habitat (G. Carr, unpubl.).
Lachnagrostis adamsonii	According to the draft recovery plan, continuing invasion by *L. ponticum* "is likely to lead to the extinction of *L. adamsonii* at a large number of sites" (Murphy 2010).
Lepidium aschersonii	*L. ponticum* invasion is an immanent threat (G. Carr, unpubl.)
Pimelea spinescens ssp. *spinescens*	According to the recovery plan, long-term viability is doubtful without intensive site management. *L. ponticum* is one of the major threats and populations will be lost unless it is controlled (Carter & Walsh 2006).
Poa sallacrustis	Weed invasion is the major threat and *L. ponticum* is one of the two major weed threats (Carter & Walsh 2006, McRobert & Carr 2008).
Prasophyllum diversiflorum	Weed invasion is the major threat and *L. ponticum* is one of two of the most serious invaders (G. Carr, unpubl., D. Pitt, pers. comm.)
Senecio psilocarpus	Weed invasion is the major threat and L. ponticum is one of the most invaders (G. Carr, unpubl.)
Trichanthodium baracchianum	*L. ponticum* is already in the vicinity of most populations and will destroy all without management (N. Reiger, pers. comm.).
Xerochrysum palustre	Weed invasion is the most serious threat and *L. ponticum* is one of the most serious invaders (N. Walsh, pers. comm.).
Neophema chrysogaster	*L. ponticum* is invading feeding grounds and continued invasion could result in loss of a large proportion of its upper saltmarsh habitat (Victorian Coastal Saltmarsh Survey 2009; G. Carr unpubl.).

Section 3 – Threat Abatement Plan

Threat Abatement

10. *Give an overview of how threats posed by this process are being abated by current (or proposed) activities. Identify who is undertaking these activities and how successful the activities have been to date.*

We know of little activity currently underway or proposed to abate threats. To date there has been very limited recognition within governments and government management agencies of the invasiveness of *L. ponticum* (in part due to its promotion for salinity control) and threats due to invasion. No comprehensive surveys have been conducted to identify invasions or their impacts. The information gained to date has come from systematic and opportunistic surveys by botanists in some of the areas where invasion is occurring. Much more comprehensive data are required to comprehensively understand the threat of this grass.

L. ponticum continues to be sold and promoted as a pasture grass in southern states. The promotion has been tempered to some small extent in recent times in acknowledgement that *L. ponticum* is invasive. The Future Farming Industries CRC determined in December 2009 it would no longer promote the planting of L. ponticum in Victoria on the basis of an assessment that the species constitutes a 'very high' weed risk in that state. However, they will continue to promote it in other southern states despite an assessment that it is a 'high' risk in other states. The Victorian Government continues to promote it in Victoria, with the only concession to weed risk being a recommendation that it be grazed to prevent seeding and that it not be planted near certain sensitive environments. However, it is exceedingly unlikely that these recommendations will substantially reduce the rate of naturalisations. In December 2009, the Victorian Government said it would review the weed status of *L. ponticum*.

However, we have not been informed of any outcome as yet.

Parks Victoria is planning to implement control of *L. ponticum* at several locations to protect threatened species. But there is no comprehensive control plan.

We have no information about control activity in other states. With limited recognition of the invasiveness of *L. ponticum*, there is likely to be control only in sites being managed for other reasons.

11. *Would the development of a threat abatement plan be a feasible, effective and efficient way to abate the process? What other measures could be undertaken?*

We consider a threat abatement plan is necessary to engender coordinated action on this invader. It will be necessary as the basis for promoting comprehensive data collection and management across the states where *L. ponticum* is invading. It is also necessary to address conflicts associated with use of *L. ponticum* as a pasture in saline areas. Recommendations are provided in Booth et al. (2009).

12. *Should the threatening process be recommended for listing under the EPBC Act, what elements could a threat abatement plan include?*

Requirements for data – comprehensive surveys of invasion and impacts of invasion
Actions needed to prevent further introductions and management of existing invasions to protect species and ecological communities under threat.

13*. Is there other information that relates to threat abatement that you would like to provide?*

Section 3 – References and Reviewers

Notes:

- The opinion of appropriate scientific experts may be cited (with their approval) in support of a nomination. If this is done the names of the experts, their qualifications and full contact details must also be provided in the reference list below.
- Please provide copies of key documentation/references used in the nomination.

15. *Reference list*

Booth C, Carr G, Low T. 2009. Weedy pasture plants for salinity control: sowing the seeds of destruction. Invasive Species Council.

Borg D, Borg D, Fairbairn L. 2003. Dundas tall wheat grass, our number one saline agronomy species for the high rainfall zone (550 mm+). Salinity under the sun - investing in prevention and rehabilitation of salinity in Australia. Hamilton, Victoria. Department of Primary Industries.

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Carter O. 2010. National recovery plan for the Curly Sedge Carex tasmanica. Victoria: Department of Sustainability and Environment.

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Muir A. 2003. *Flora and Fauna Guarantee Action Statement 31*. *Small Psoralea, Cullen parvum*. Department of Sustainability and Environment, Victoria.

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Virtue JG, Melland RL. 2003. The environmental weed risk of revegetation and forestry plants. Adelaide: Animal and Plant Control Commission; Department of Water, Land and Biodiversity Conservation; and CRC for Australian Weed Management.

Walsh NG. 2008. A new species of *Poa* (Poaceae) from the Victorian Basalt Plain. *Muelleria* 26: 17-20.

Walsh NG, Entwisle TJ. 1994. Flora of Victoria, Volume 2. Melbourne: Inkata Press.

Weiss J, Iaconis L. 2001. Tall wheat grass, *Lophopyrum ponticum.*An assessment of weed potential for Parks, Flora and Fauna Division. Frankston: Victorian Department of Natural Resources and Environment.

Unpublished data

Geoff Carr, Botanist, Ecology Australia, Victoria

Personal communications

Mark Bachmann, Department of Environment & Heritage, South Australia

David Pitts, Department of Sustainability and Environment, Portland, Victoria

Nushka Reiger, Department of Sustainability and Environment, Horsham, Victoria

Neville Walsh, National Herbarium of Victoria

Map 1 Records of Tall Wheat Grass (*Lophopyrum ponticum*) naturalisation in Victoria (Booth et al. 2009)