

Northern and Yorke Natural Resource Management Board
Yorke NRM District Weed Action Plan
November 2018



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Introduction

Declared pest plants (weeds) described within this plan have a demonstrated ability to rapidly expand their distribution given favourable seasonal conditions impacting on agricultural, natural and social environs.

After stakeholder and community consultation and input, it is intended that this plan be used by the Yorke Natural Resource Management (NRM) District to guide prioritisation of declared plant management activities within the district.

This District Action Plan will be reviewed to prioritise weed species and activities regularly. This will be undertaken by district staff who will ensure the Northern and Yorke NRM Board (the Board) remains informed and therefore committed to the plan's ownership and implementation. Monitoring of the district's weed management actions and achievements will be facilitated through quarterly district reporting to the Board.

Purpose

The district plan identifies priority weed species for allocation of resources and outlines best practice weed management principles and management actions that the Board, its staff, landholders and community can implement within the Yorke District that aim to reduce the current and potential impacts of eleven priority weeds.

The management actions outlined for each of the eleven priority weeds are aligned with South Australian state policies for declared plants and the Northern & Yorke NRM Board regional declared plant policies. The plan also provides information on the distribution, possible threats and impacts and policy on each of the priority weeds and links to current best practice control methods and surveying/monitoring actions.

Some of the weed species detailed in this plan are at differing stages of the invasion curve. Managing current infestations and removing potential sources for new infestations will save considerable resources required to control large infestations of persistent weeds.

Prevention and Education of new weeds entering the district holds the highest priority

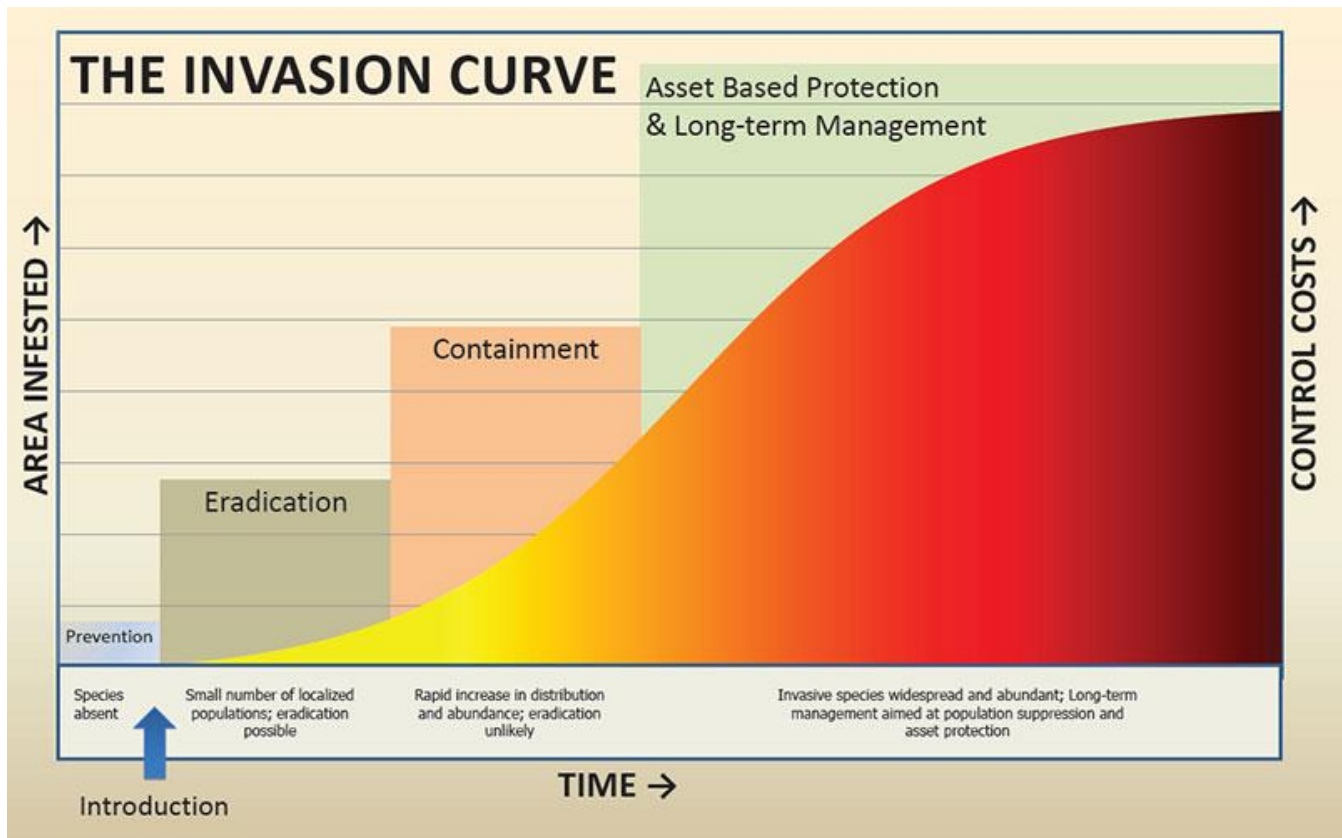


Figure 1. Generalised invasion curve showing actions appropriate to each stage of invasive species (<http://www.mda.state.mn.us>)

Alert species have the highest priority in the district and should be reviewed by the district staff annually, any situation or legislative changes actioned and communicated to the district's key stakeholders e.g. Yorke Peninsula Council, Copper Coast Council, Barunga West Council, Agricultural Bureaus, Agronomists, Government Departments (e.g. SA Water, DPTI), and Community.

This priority is because the economic practicality of managing weeds before they become established is much higher than if the weeds become widespread and abundant (Figure 1). The feasibility of control is most realistic when the plant populations are new, small in number and localised, and for these reasons the Board places prevention, communication and education of new weeds entering the Northern and Yorke Region and Yorke District at the highest priority.

Determining Priority Weeds

There are over 130 declared plants under the NRM Act in SA. Resources need to be allocated to priority plants determined by the level of threat they pose to agricultural, biodiversity and community values. The Board uses a risk management approach to determining the level of threat, priority and the allocation of limited resources to declared weed species in this region. This process involves working through the Biosecurity SA (PIRSA) weed risk assessment (PIRSA weed risk management guide, 2008).

Input from the Naturally Yorke Community Action Planning (CAP) workshops have helped to determine priority target weed species for specific locations on the Yorke Peninsula using this process of risk assessment. This plan aims to assist the community protect assets identified through the Naturally Yorke CAP process which aims to combine and focus weed management efforts of the community, experts and stakeholders.

The PIRSA weed risk assessment process establishes a management strategy for each weed for each land-use the process is applied to. It provides initial direction to the following management strategies for the eleven identified priority weed species in the Yorke District (Table 1).

Successful implementation of this plan is dependent on;

1. allocating resources to manage the identified priority weed species.
2. the Board and its staff remaining focussed on this key objective where resources and capacity are available.
3. resources not being allocated to management of species that are not prioritised through this process; in these cases limited or no action should be taken.
4. the above points being clearly communicated from the Board to staff, landholders and stakeholders in the region.

Opportunities may arise where management of declared weed species other than identified priority species may occur however, this would be through external funding opportunities e.g. Weeds of National Significance (WoNS), or as part of a partnership project objective.

Another factor which determines management actions is land tenure e.g. public land, roadsides and private lands. Actions will vary according to species, land-use and tenure. However, surveillance, education and extension, awareness programs and compliance are a significant portion of management actions available to NRM staff. These actions are described in the management actions for priority weeds in this plan.

Table 1. Eleven priority weeds included in the Yorke NRM District Plan and for each weed; the landscape they do or can infest, the management strategy and description of the management strategy.

Priority Weed	Landscape		Management strategy	Description of management strategy
	UYP	SYP		
African Boxthorn (<i>Lycium ferocissimum</i>)	✓	✓	manage weed	African boxthorn is common in the district and aim is to reduce the overall economic and/or social impacts of this weed through targeted management. See page 9 for more details
Boneseed (<i>Chrysanthemoides monilifera ssp monilifera</i>)	✓	✓	destroy infestations	Boneseed has a limited distribution within the district and the aim is to prevent spread through destroying all plants in the district. See page 11 for more details.
Bridal Veil (<i>Asparagus declinatus</i>)		✓	destroy infestations	Bridal veil has a limited distribution within the district and the aim is to prevent spread through destroying all plants in the district. See page 13 for more details.
Buffel Grass (<i>Cenchrus ciliaris</i> , <i>Cenchrus pennisetiformis</i>)	✓	✓	destroy infestations	Buffel grass has few records within the district and the aim is to prevent establishment and spread by destroying all plants in the district. See page 15 for more details.
Calomba Daisy (<i>Oncosiphon suffruticosum</i>)	✓	✓	contain spread	Calomba daisy is widespread in the northern Adelaide agricultural landscape and is slowly moving around the top of Gulf St Vincent along roadsides and through Clinton CP. The aim is to manage weed and prevent spread through education and containment management. See page 17 for more details
Caltrop (<i>Tribulus terrestris</i>)	✓	✓	manage weed	Caltrop has significant impact in towns in the district. It requires quick action and relationships with the local councils to aid quick action. The community will need reminding of their roles and responsibilities in controlling caltrop in townships. See page 19 for more details.
Creeping Knapweed (<i>Rhaponticum repens</i>)	✓	✓	destroy infestations	Creeping knapweed has no current records within the district. The aim to prevent spread through destroying any plants in the district swiftly. See page 21 for more details.
Horehound (<i>Marrubium vulgare</i>)		✓	manage weed	Horehound is widespread and persistent. The district aims to manage the weed to prevent further spread between properties. See page 23 for more details.
Khaki Weed (<i>Alternanthera pungens</i>)	✓	✓	Alert and Eradicate	Khaki weed has no current records within the district. The aim to prevent spread through destroying any plants in the district swiftly. See page 25 for more details.
Lincoln Weed (<i>Diplotaxis tenuifolia</i>)		✓	manage weed	Lincoln weed is a weed of community and agricultural concern. It is widespread in the SYP landscape and is slowly moving north along roadsides. The aim to manage weed and prevent spread through education and containment management. See page 27 for more details.
Silverleaf Nightshade (<i>Solanum elaeagnifolium</i>)	✓	✓	contain spread	Silverleaf nightshade is widespread in the Mid-North and UYP landscape and is slowly moving south into the district. The aim to manage weed and prevent spread through education and containment management is critical since control of established infestations is slow and expensive. See page 29 for more details.

The management strategy of each weed species is determined by assessing each weed species through the weed risk assessment. The assessment process evaluates the potential impacts and feasibility of control in different land uses. When weeds have a social, environmental and/or economic impact on more than one land use, then the priority of management action on those weeds increases.

It is through this localised assessment process that different weeds will be assigned different priorities in the three districts of the Northern and Yorke NRM Region.

Table 2. Management Strategy aims and actions

Strategy	Aims and actions of management strategies
Alert / Report	<p>Species that are not known to be present in the management area and which represent a significant threat if permitted to enter and establish.</p> <p>Aims to prevent the species arriving and establishing in the management area.</p> <ul style="list-style-type: none"> • Prevention of entry to management area • Ongoing surveillance for incursions of the species • Training & awareness activities for the community to enable early detection
Eradicate	<p>Aim to remove the weed species from the Yorke district (and N&Y NRM Region).</p> <ul style="list-style-type: none"> • Detailed surveillance and mapping to locate all infestations • Destruction of all infestations including seed banks • Prevention of entry to region and movement and sale within • Must not grow and all cultivated plants to be removed • Monitor progress towards eradication
Destroy Infestations	<p>Aim to significantly reduce the extent of the weed species in the Yorke District (and the N&Y NRM region).</p> <ul style="list-style-type: none"> • Detailed surveillance and mapping to locate all infestations • Destruction of all infestations, aiming for local eradication at feasible sites • Prevention of entry to region and movement and sale within • Must not grow • Monitor progress towards reduction
Contain Spread	<p>Aim to prevent the ongoing spread of the weed species in the Yorke District (and the N&Y NRM region).</p> <ul style="list-style-type: none"> • Surveillance and mapping to locate all infested properties • Control of all infestations, aiming for a significant reduction in weed density • Prevention of entry to region and movement and sale within • Must not allow it to spread from cultivated plants (if grown) • Monitor change in current distribution
Protect Sites	<p>Aim to prevent spread of the weed species to key sites/assets of high economic, environmental and/or social value.</p> <ul style="list-style-type: none"> • Weed may be of limited current distribution but only threatens limited industries/habitats (lower weed risk). Or the weed may be more widespread but is yet to invade/impact upon many key sub-regional industries/habitats (higher weed risk) • Surveillance and mapping to locate all infested sub-regions. • Identification of key sites/assets in the region. • Control of infestations in close proximity to key sites/assets, aiming for a significant reduction in weed density. • Limits on movement and sale of species within region. • Must not allow to spread from cultivated plants (if grown) in close proximity to key sites/assets. • Monitor change in current distribution within and in close proximity to key sites/assets.
Manage Weed	<p>Aim to reduce overall economic, environmental and/or social impacts of the weed species through targeted management.</p> <ul style="list-style-type: none"> • Research and develop integrated weed management (IWM) packages for the species, including herbicides and biological control where feasible. • Promote IWM packages to landholders. • Monitor decrease in weed impacts with improved management. • Identify key sites/assets in the region and ensure adequate resourcing to manage the weed species.
Manage Sites	<p>Aim to maintain overall economic, environmental and/or social value of key sites/assets through improved general weed management.</p> <ul style="list-style-type: none"> • Promote general IWM principles to landholders, including the range of control techniques, maintaining competitive vegetation/crops/pastures, hygiene and property management plans • Identify key sites/assets in the region and ensure adequate resourcing to manage these to maintain their values • Broaden focus beyond weeds to all threatening processes
Monitor	<p>Aim to detect any significant changes in the species' weed risk</p> <ul style="list-style-type: none"> • Monitor the spread of the species and review any perceived changes in density and location.
Limited/ No Action	<p>The weed species would only be targeted for coordinated control in the management area if its local presence makes it likely to spread to land uses where it ranks as a higher priority. Facilitate local action to undertake control measures if required for the benefit of other land uses at risk.</p>

How will we manage weeds

Property Management

The management of priority weeds on property is not always a simple process and often requires a planned and consistent approach to gain the cooperation of landholders and achieve the desired on-ground actions. District staff will inspect properties and communicate to landholders (public and private) through any available approaches such as face-to-face and written correspondence. Stakeholder groups will be engaged through broader awareness programs and the media dependent upon those detailed in the district actions for each of the priority weeds.

When addressing weed management on property staff are guided by the *Northern & Yorke NRM Board's Operational Process for Achieving Sustainable Natural Resource Management in its Region*. This document provides foundational information, potential information and incentives available to landholders, voluntary remediation options as well as a system of compliance. It is to be noted that higher level compliance activities should only be considered as an option once all reasonable and regular attempts to attain the landholder's voluntary cooperation have failed.

Staff will be guided by the Board's Operational Process for Achieving Sustainable Natural Resource Management for the policy settings and defined actions for individual plants as well as other specific Regional Pest Management Plans that may have been adopted by the Board. In situations where a plant is recently declared at state level, the State Policy for the plant will be applied. Sections of the *Natural Resources Management Act, 2004* which may apply to each priority plant are defined in the following table:

175(1)	Prohibiting entry to area
175(2)	Prohibiting movement on public roads
177(1)	Prohibiting sale of the plant
177(2)	Prohibiting sale of contaminated goods
180	Requiring notification of infestations
182(1)	Landowners to destroy the plant on their properties
182(2)	Landowners to control the plant on their properties
185	Recovery of control costs on adjoining road reserves

Roadsides Management

Road reserves are a recognised pathway for the introduction and movement of declared plants. It is a priority of the Yorke District to stop the introduction and minimise the establishment of new pests by managing road reserves through a systematic inspection and strategic control regime.

Limited resources determine that not all declared plants will be managed on road reserves to the same levels. A plant's level of management will be determined by the Weed Risk Assessment system and the potential threat that it poses to the adjoining land-use.

The following plants have been identified as those that will be included in the Yorke District road reserve management program:

- Buffel grass All Hundreds
- Silverleaf nightshade All Hundreds south of containment line - Copper Coast Highway
- Bridal veil All Hundreds

- Khaki weed All Hundreds - where detected
- Lincoln Weed All Hundreds north of the established containment line
- African boxthorn Focus will be given to this plant where it exists as a stand-alone plant (no off-target damage) and on road reserves in the hundreds and years as per the following:
 - 2018/19 – Hundreds of Warrenben
 - 2019/20 – Hundreds of Carrabee, Para Wurlie and Coonarie
 - 2020/21 – Hundreds of Moorowie, Melville and Dalrymple

The process for implementing control of declared plants on road reserves will be as outlined in the Northern & Yorke NRM Board’s Roadside Declared Plant Control Policy – see Appendix A. The physical control of infestations will be carried out by either landholders or the Board through the Roadside Control Program (Appendix A; section 4). The district will carry out control using the internal resources of staff and equipment or the engagement of contractors which will be dependent upon the specific task and availability. Timing of control activities will be as described in the Annual Work Plan.

Declared plants and weeds threaten the condition of assets in the Yorke District and weed management activities mitigate these threats. The Yorke District assets are:

- Agricultural Assets such as cropping and pastoral land and hobby farms
- Environmental Assets such as National and Conservation Parks, Native Vegetation Heritage Agreements, coastal habitats and threatened species habitat
- Tourist and Recreational areas such as camping areas, town reserves, parks and ovals, amenity of high visitation sites, and
- Aboriginal and European Heritage sites

Review Period

It is intended that this district plan be implemented over the next 5 years (2019 – 2023). The longer length of time on this plan sets a realistic time for weed management and allows substantial time for repeated follow up action.

In the third year of the plan it is suggested that the Yorke District, through its Naturally Yorke Community Action Planning (CAP) process, review progress and update management targets and actions accordingly.

Suggested time frame:

Year	Activity
2018	Draft plan reviewed by the Yorke District and feedback incorporated into the Plan Plan endorsed by the N&Y NRM Board
2019	Implementation
2020	Implementation
2021	Implementation Review progress and update the plan as required (and then every 5 years)
2022	Implementation
2023	Implementation

Annual Work Plan

District and staff work plans and priorities can be implemented on a yearly and seasonal basis.

Alert weed species have a higher priority in the district and should be reviewed by the district staff annually and changes actioned and communicated to the districts key stakeholders e.g. Barunga West Council, Copper Coast Council, Yorke Peninsula Council, Ag Bureaus, Agronomists, Departments (e.g. SA Water, DPTI), and Community.

The Annual Work Plan (Table 3) describes seasonal plant growth stages and optimal control periods. It also includes a seasonal schedule for two main weed management activities; 1. Inspect/Monitor and 2. Notify/Educate. Tasks under each activity include but are not limited to;

1. Inspect/Monitor
 - Monitor/collect data conduct roadside and property inspections (low level compliance)
 - Inspecting known control sites, and
2. Notify/Educate
 - Public Media Release (e.g. social media, newsletters, newspaper) about weed management responsibilities
 - Community Group meetings, field demonstrations and workshops
 - Landholder fact sheet mail out
 - Implementing control programs

Table 3. Yorke District Pest Plant Management – Annual Work Plan												
African Boxthorn	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination/Present												
Active Growth/Flowering						☀	☀	☀	☀	☀		
Fruiting/Seeding								🔴	🔴	🔴	🔴	🌪
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Boneseed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination/Present												
Active Growth/Flowering							☀	☀	☀			
Fruiting/Seeding									💧	💧	🌪	
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Bridal Veil	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination/Present												
Active Growth/Flowering							☀	☀	☀			
Fruiting/Seeding									💧	🔴	🌪	
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Buffel Grass	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination												
Active Growth/Flowering												🌪
Seeding	🌪	🌪										
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												

Calomba Daisy	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination/Present												
Active Growth/Flowering												
Seeding												
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Caltrop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination												
Active Growth/Flowering												
Fruiting/Seeding												
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Creeping Knapweed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination												
Active Growth/Flowering												
Fruiting/Seeding												
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Horehound	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination/Present												
Active Growth/Flowering												
Seeding												
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Khaki Weed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination/Present												
Active Growth/Flowering												
Fruiting/Seeding												
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Lincoln Weed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination												
Active Growth/Flowering												
Seeding												
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												
Silverleaf Nightshade	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Germination/Dormant												
Active Growth/Flowering												
Fruiting/Seeding												
Inspect or Monitor												
Notify and/or Educate												
Optimal Treatment												

African Boxthorn (<i>Lycium ferocissimum</i>)		
Common name(s):	African Boxthorn	
Plant description:	African boxthorn is a branched shrub to 5m high and 3m wide. Spines occur on the main stems and branchlets, branchlets terminate with a spine. Flowers visible predominately in summer (but may occur all year round), are pale lilac to white with purple markings at the base. Fruit is dull orange-red berry (1 cm diameter).	
Weed Risk Assessment Rating:	Native Vegetation	Manage Weed
	Non-arable Grazing	Manage sites
	Urban	Protect Sites
Threats and Impacts	The weed threat of African Boxthorn in the Yorke is existing, it is a declared plant with a historical legacy that persists in all environments.	
Invasiveness	African boxthorn is highly invasive and spread by various means. It colonises degraded or naturally disturbed landscapes, such as coastal vegetation where density of the native dominants had been reduced by grazing and other disturbances.	
Impacts	African boxthorn usually grows among other shrubs due to seed voiding by perching birds but can grow as a free standing multi-stemmed shrub in open paddocks. It reduces the value of pastoral land and replaces native species in vegetation communities, especially on coastal cliffs, back dunes and along creek lines. It is avoided by livestock, and although it is non-toxic the spines may cause physical injury to stock as well as limiting their access to water and pasture; the spiny thickets also provide harbour for rabbits and foxes. On the other hand, many small native birds adopt boxthorn as a protective habitat and food source.	
Persistence	Boxthorns are long-lived shrubs that regenerate after fire. They are also drought tolerant, losing leaves in periods of drought stress or even dying back and later reshooting from the base.	
Current Distribution		
State and N&Y NRM region	In South Australia, common in large areas of the arid lands, on islands off Yorke and Eyre Peninsula and amongst coastal dunes from western Eyre Peninsula to the South East.	
Yorke District	African Boxthorn is common at low densities throughout the UYP. However, there are significant dense infestations in the SYP.	
Potential distribution	African Boxthorn has the potential to re-infest properties that have been previously treated, easily infests coastal areas, invades remnant native vegetation and can increase in density where unmanaged.	
Policy		
N&Y NRM Policy:	Declarations under the NRM Act: 175(2), 177(1), 177(2), 182(2), 185	

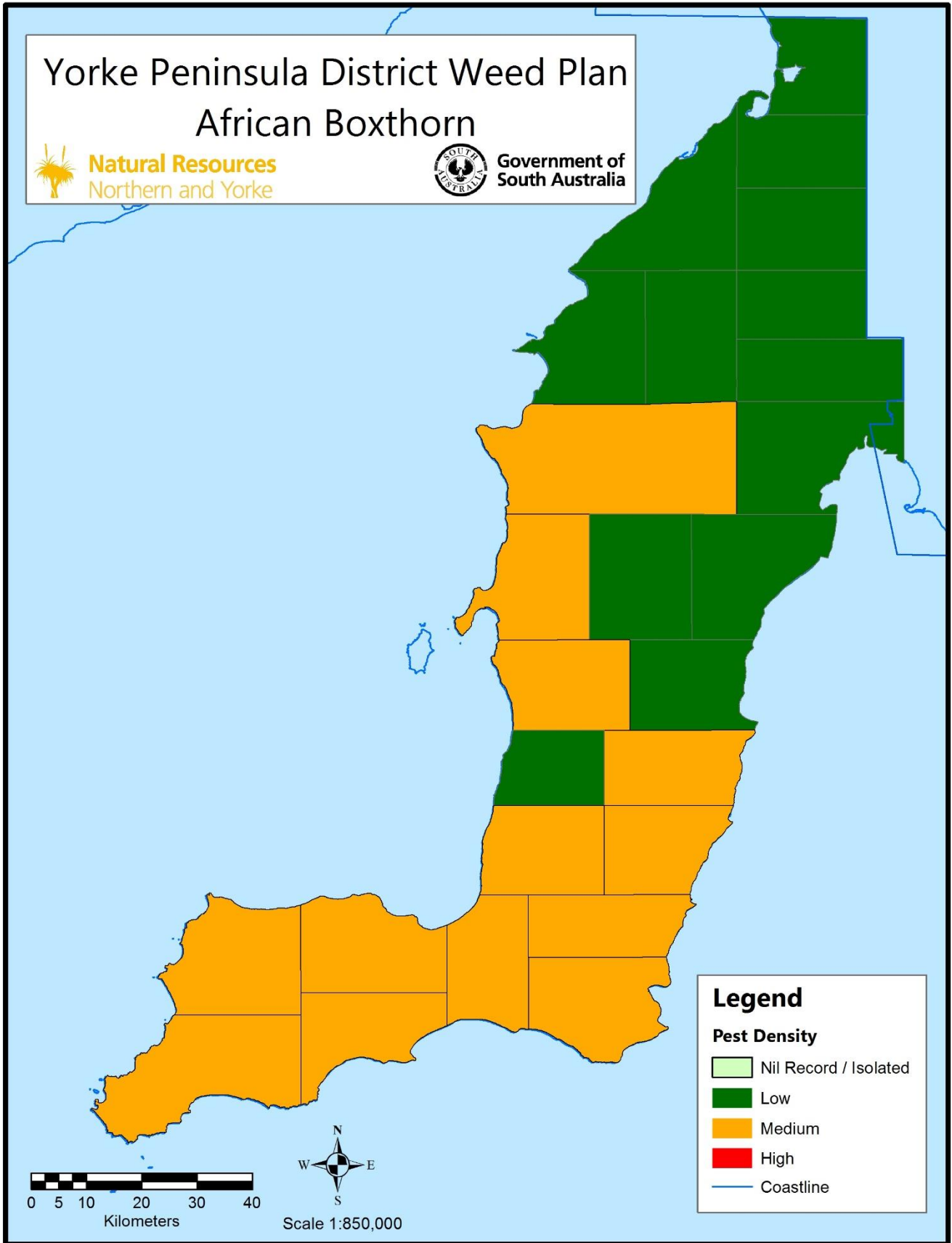
Yorke Peninsula District Action Plan
<p>Justification for Action:</p> <p>The Yorke District in line with N&Y Region Policy and management strategy is to Manage Weed and Priority Sites infested with African Boxthorn with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of African Boxthorn.</p> <ul style="list-style-type: none"> • Focus control efforts on stand-alone African Boxthorn • Identify key sites/assets in the district and apply adequate resourcing to manage African Boxthorn • Educate landholders on their responsibilities for control of African Boxthorn • NRM Notification Advices for non-compliance • Develop species specific 10-year management plan for rolling hundreds for Boxthorn control to be undertaken to protect CAP identified Environmental Assets and Tourist locations from reinfestation after Boxthorn control has been undertaken.

Yorke Peninsula District Weed Plan

African Boxthorn



Government of
South Australia



Boneseed (*Chrysanthemoides monilifera* ssp *monilifera*)

Common name(s):	Boneseed	
Plant description:	Boneseed is a shrub introduced from South Africa in 1858 as an ornamental garden plant, and in Australia was originally planted as a garden species and to stabilise sand dunes. A perennial erect shrub which grows up to 3m high, a shallow root system and is relatively short-lived (10-20 years). It has woody branched stems and oval shaped leaves with irregularly serrated edges. New growth is typically covered by white downy cotton-like material. The yellow flowers appear between July-October and have 5–8 petals and are up to 30 mm in diameter. The round fleshy green fruit turn black when mature and contain a single smooth round seed 6–7mm in diameter. The seed is bone coloured when dry, hence the name 'boneseed'.	
Weed Risk Assessment Rating:	Native Vegetation	Destroy Infestations

Threats and Impacts

Invasiveness	Boneseed is fast growing, has high seed production and efficient dispersal methods. The seed is produced in berries and may be dispersed by birds, wallabies and foxes up to a few kilometres. Seedlings germinate in autumn and quickly establish before the next dry season. Boneseed is able to invade native woodland and sclerophyll forest vegetation with no visible disturbance.	
Impacts	Boneseed establishes under the canopy of native vegetation where it reaches high densities in the shrub stratum under 2m tall. It displaces native species due to its dense growth. Boneseed invades undisturbed native vegetation, and is a common weed in some conservation parks. It reduces the integrity of native vegetation and excludes much of the native understorey vegetation.	
Persistence	Boneseed persists after control operations or fires from a large seed bank of dormant seed in the soil. Control programs have reduced the seed source of established plants in many areas, and where seedlings are continually removed some reduction in spread rate is likely to occur. A major problem in co-ordinated control has been a lack of recognition of the plant in the early stages of invasion.	

Current Distribution

State and N&Y NRM region	A project to eradicate the weed from Yorke and Eyre Peninsula began in 2007 stemming from noticeable infestations which occur in the Adelaide Mount Lofty Ranges (AMLR) region.	
Yorke District	Boneseed has infested several locations within Innes National Park and Corny Point, and there are isolated outlier patches throughout the Yorke District which are detailed in the Boneseed Management plan.	
Potential distribution	Without effective control programs, boneseed has the potential to become more abundant within its current range and to spread into new areas. Most of southern Australia, including Tasmania, is threatened by boneseed.	

Policy

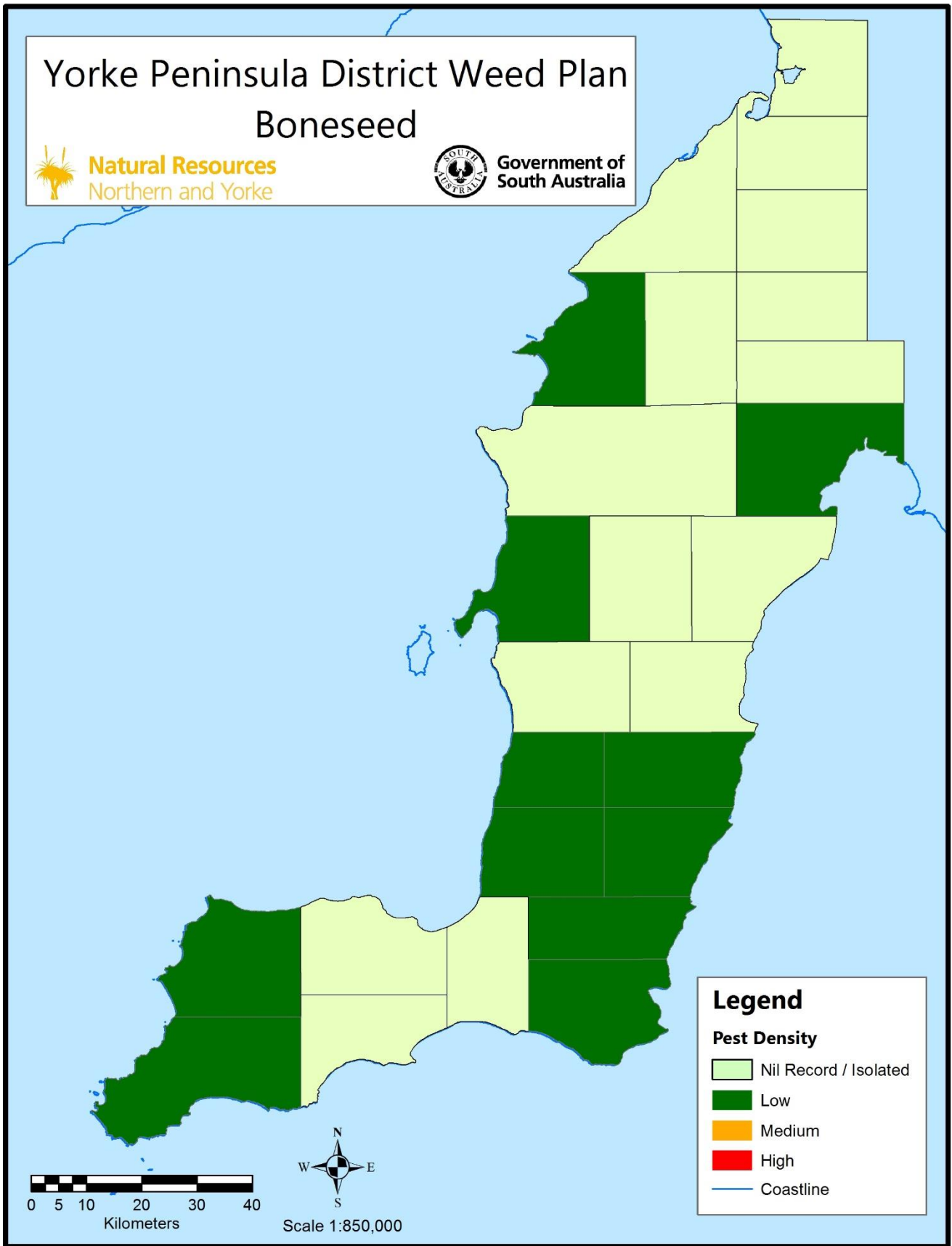
N&Y NRM Policy:	Declarations under the NRM Act: 175(1), 175(2), 177(1), 177(2), 182(2), 185
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Yorke Peninsula District Action Plan

Justification for Action:

The Yorke District in line with N&Y Region Policy and management strategy is to Manage Weed and Destroy in Priority sites infested with Boneseed, with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management with other declared pest plants.

- Focus control efforts on revisiting outlier patches of Boneseed and apply adequate resourcing to manage Boneseed at Innes National Park and Corny Point
- Educate landholders on their responsibilities for control of Boneseed



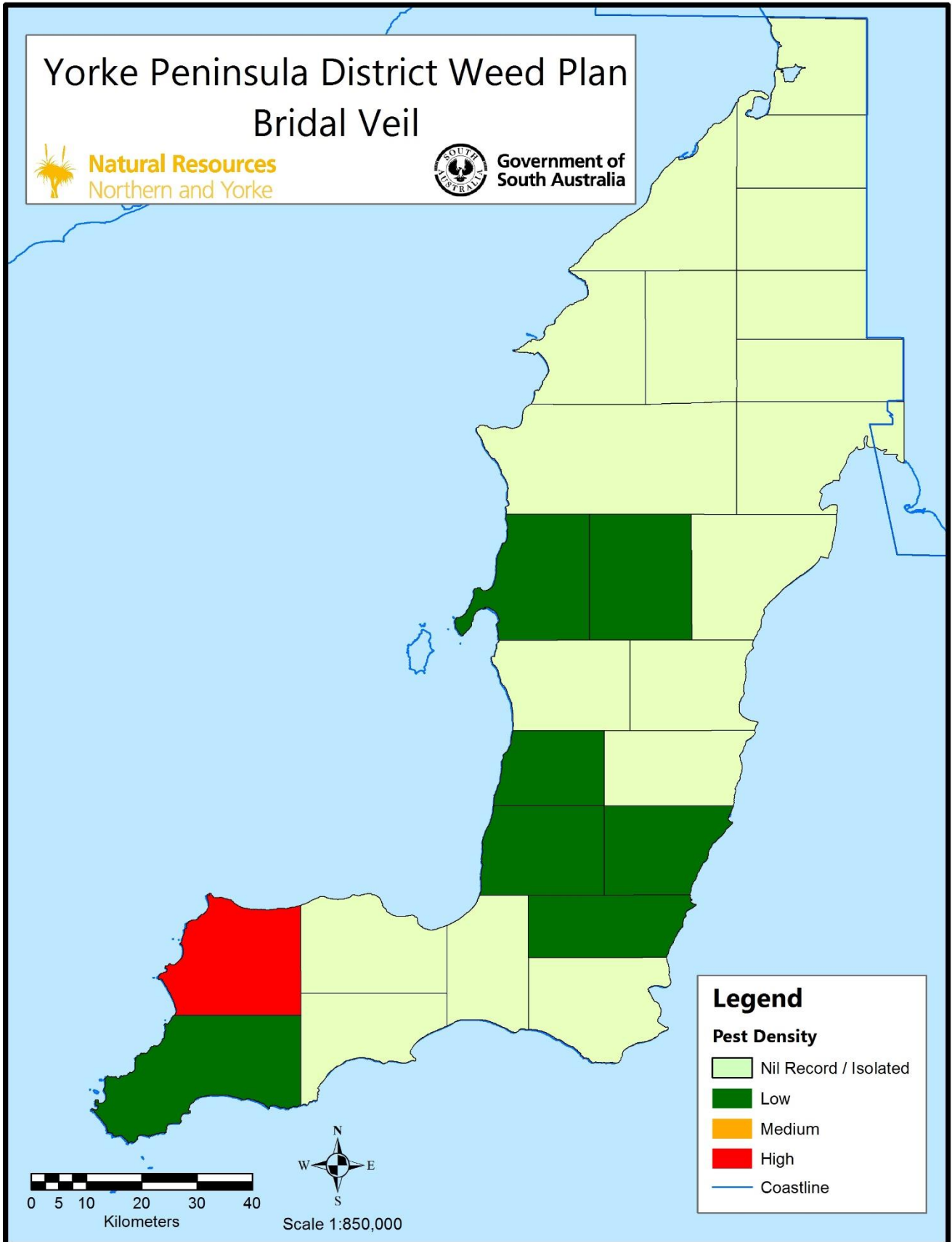
Bridal Veil (<i>Asparagus declinatus</i>)	
Common name(s):	Pale berry asparagus fern, Asparagus fern, South African (bridal) creeper
Plant description:	Introduced from South Africa in 1870 as a garden ornamental Bridal Veil is a scrambling or weakly climbing perennial with annually renewed, wiry stems arising from a tuberous rootstock. The top growth completely dies off over summer in most environments. The stems are slender and spineless. There are 3 'leaves' per axil that are linear, soft, 3-10 mm long and 0.25-0.5 mm wide. The flowers are visible in autumn and winter, bisexual and greenish white with petals 5-6 mm long. The berries are egg-shaped, translucent white to blue-grey when ripe and 10 mm long x 7 mm wide.
Weed Risk Assessment Rating:	Native vegetation Destroy Infestations
Threats and Impacts	
Invasiveness	Seed of bridal veil is produced in large berries, which are dispersed by birds such as starlings and currawongs. Seedlings establish readily even in undisturbed native vegetation.
Impacts	Bridal veil is a strong competitor whose dense canopy overshadows native plants and blocks sunlight during the winter growing season. It also competes for soil space and nutrients though the dense mat of tubers developed along its rhizomes.
Persistence	Bridal veil can maintain itself indefinitely in native vegetation, regenerating readily from tubers after fires and dry summers. It replaces the original ground layer and competes with shrub layers.
Current Distribution	
State and N&Y NRM region	Bridal veil is scattered throughout the Eyre Peninsula, Kangaroo Island, Northern & Yorke, AMLR regions.
Yorke District	Bridal Veil infests the Corny Point area and has small outlier populations in Maitland, Cunningham, South Kilkerran, Mt Rat, Minlaton, Stansbury and Innes National Park detailed in the Bridal Veil Management plan.
Potential distribution	Climate suitability modelling indicates bridal veil has not reached its potential distribution. Further spread is possible throughout most of the Eyre Peninsula, Kangaroo Island, AMLR and South-East regions, and the southern parts of the N&Y and SAMDB regions.
Policy	
N&Y NRM Policy:	Declarations under the NRM Act: 175(2), 177(1), 177(2), 182(2), 185

Yorke Peninsula District Action Plan
<p>Justification for Action: The Yorke District in line with N&Y Region Policy and management strategy is to Manage Weed and Priority sites infested with Bridal veil with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of other declared pest plants.</p> <ul style="list-style-type: none"> • Focus control efforts on revisiting outlier patches of Bridal Veil and apply adequate resourcing to manage Bridal Veil at Innes National Park and the Corny Point Area • Educate landholders on their responsibilities for control of Bridal Veil • NRM Notification Advices for non-compliance

Yorke Peninsula District Weed Plan Bridal Veil



Government of
South Australia



Buffel Grass (*Cenchrus ciliaris*, *Cenchrus pennisetiformis*)

Common name(s):	Mamu grass, Rhodesian foxtail, African foxtail, black buffel grass, foxtail buffalo grass, blue buffel grass, anjan grass	
Plant description:	Introduced from Africa and Asia for rangeland improvement, Buffel Grass is a perennial, erect, tussock forming, deep rooted grass 0.2 -1.5 m high. Buffel has a deep root system, some with rhizomes up to 50 cm in length. Stems grow from a centralised point to form a tuft. Leaves are rough textured due to small stiff hairs, with prominent midribs. Green when actively growing and straw coloured in dry times.	
Weed Risk Assessment Rating:	Native Vegetation	Contain spread
	Non-arable Grazing	Monitor

Threats and Impacts

Invasiveness	Buffel grass spreads through dispersal of its fluffy burrs by wind, water and animals, particularly along drainage lines, roads and other transport corridors. Its spread along roads can also be assisted by vehicle draughts and movement of soil by graders and other vehicles. Buffel grass may be slow to establish initially but it may then spread readily beyond the introduction sites under favourable seasonal conditions. Buffel grass invasion is facilitated by burning, producing positive feed-back between fire and the invasion of buffel grass. Higher fuel loads associated with large-scale buffel grass invasion can support fires of far greater intensity, frequency or spatial area than would have occurred previously.	
Impacts	Buffel grass has been identified as a transformer species in rangelands as it can change the character of vegetation over substantial areas. Although a useful fodder species for periods after rain on rangelands of northern Australia, in many habitats it reduces pasture productivity in the long term. Through competition with native species, it reduces diversity of native pastures including native grasses that are highly valued fodder after rain. Dry foliage can form a relatively continuous flammable ground layer that can carry extensive and intense fires.	
Persistence	The high seed production and moderate seed dormancy of buffel grass enables it to build up a large seed bank in the soil. Seeds may lie dormant in the ground for up to 8 months, while retaining their original viability. Beyond 12 months, germination rates drop to less than 12%, and remain at 10% for a further two years.	

Current Distribution

State and N&Y NRM region	Within South Australia it has been recorded in the Alinytjara Wilurara, South Australian Arid Lands, Eyre Peninsula, South Australian Murray-Darling Basin (SAMDB), AMLR, and South East NRM regions.	
Yorke District	There are only a few individual records for Yorke Peninsula. These mapped locations are monitored and revisited regularly.	
Potential distribution	Climatic modelling for South Australia predicts that no part of the State's land area is entirely unsuitable for establishment of buffel grass. The model presented in the South Australia Buffel Grass Strategic Plan shows that the degree of suitability for establishment is variable across the State: 30.5% is "moderately suitable", a further 42% is "highly suitable", and a further 27.5% is "very highly suitable". A relatively small proportion of the State (0.03% or 33,000 ha, confined to the South Australian Arid Lands and Alinytjara Wilurara NRM Boards) was predicted as "extremely suitable".	

Policy

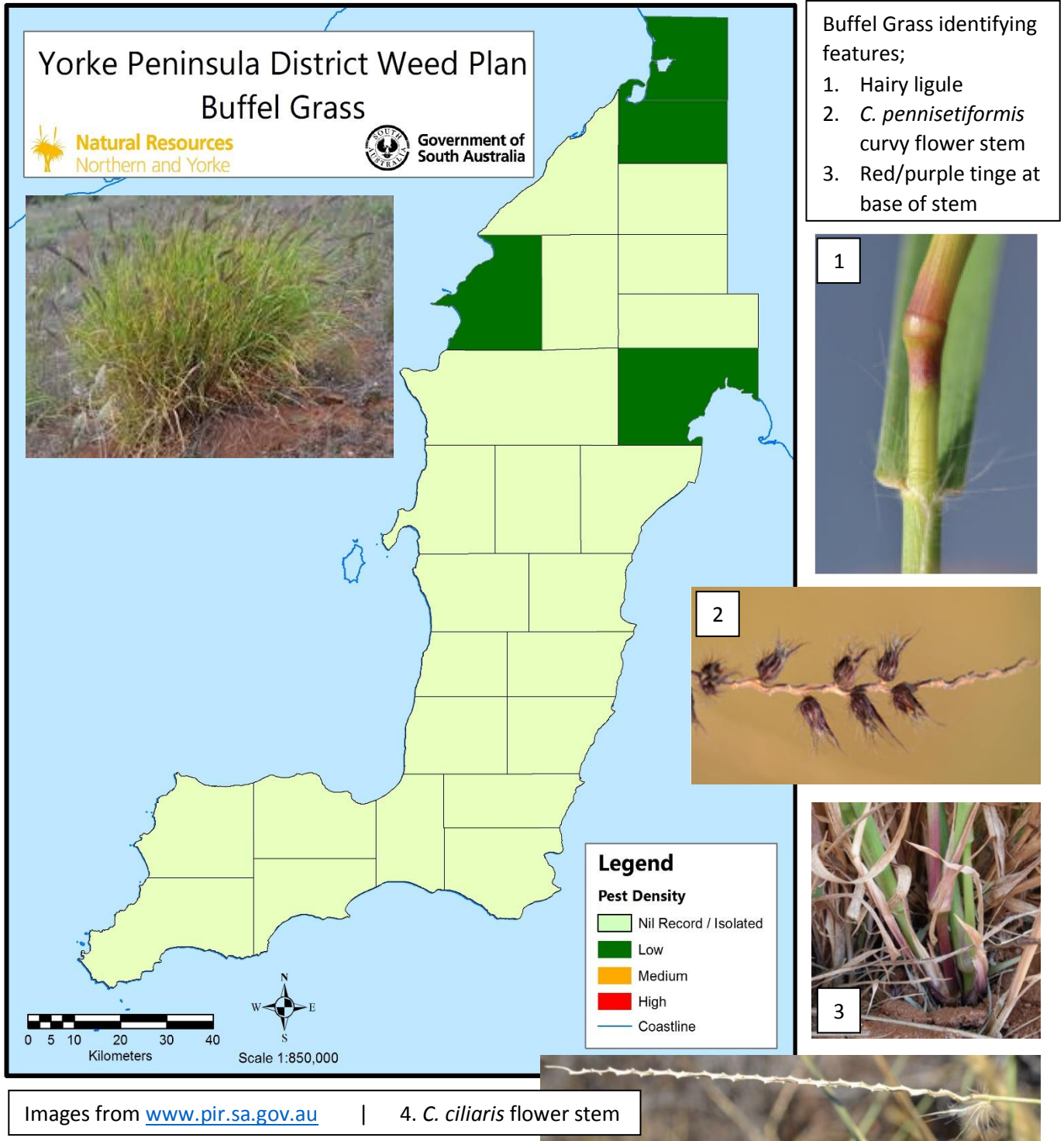
N&Y NRM Policy:	Declarations under the NRM Act: 175(1), 175(2), 177(1), 177(2), 182(2), 185
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Yorke Peninsula District Action Plan

Justification for Action:

The Yorke District in line with South Australia Buffel Grass Strategic Plan, N&Y Region Policy and management strategy is to Manage Weed and Priority sites infested with Buffel grass with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of African Boxthorn.

- Monitor and Control recorded sites of Buffel Grass along transport corridors and apply adequate resourcing to manage outbreaks
- Educate landholders on their responsibilities for control of Buffel Grass
- NRM Notification Advices for non-compliance



Calomba Daisy (*Oncosiphon suffruticosum*)

Common name(s):	Calomba Daisy	
Plant description:	Calomba daisy was accidentally introduced in 1922 from South Africa in drought fodder. It is an erect strongly chamomile-scented annual herb to 60cm high. Seedlings are tiny and require gaps in pasture or bare ground to establish, over-winter plant forms as rosettes, then flower stems develop to about 60cm tall in August. Flowers appear in October through to November and are minute, mustard yellow, and arranged at the end of the stems in broad flat groups of ball-shaped heads. Each flower forms a seed about 2mm long, ribbed and minutely crowned with white scales to 1mm. Leaves are grey-green in colour, 2-4cm long and divided into thin lobes, which give a feather like appearance. The plants die in early summer leaving dry woody stems carrying the seeds. The seeds of Calomba daisy are partially adapted for dispersal by wind but tend to remain in the flower head until it breaks up. The daisy has a slender taproot with fibrous branching laterals.	
Weed Risk Assessment Rating:	Non-arable Grazing	Monitor

Threats and Impacts

Invasiveness	Calomba daisy has high seed production, but as the seed has no adaptations for dispersal, its spread is slow and depends on opportunistic movement by wind, water, hay or vehicles. It requires bare ground to establish and is a poor competitor, only dominating pastures if competition from grasses or perennial vegetation is reduced, especially by heavy grazing.
Impacts	Calomba daisy is primarily a weed of perennial pastures. It is unpalatable to stock and also reduces the growth of pasture species by allelopathic chemicals that it releases into the soil. If eaten by stock, the foliage will taint meat and milk products with its strong camomile scent. Calomba daisy is not usually a problem in cropping rotations, as it is easily controlled by knockdown and pre-emergent herbicides. However, a late germination of Calomba daisy may reduce the yield of a stressed or uncompetitive crop. Alternatively, short crops such as field peas may be overtopped by a late germination of Calomba daisy resulting in yield reduction.
Persistence	Calomba daisy is a winter annual species well adapted to semi-arid areas. It produces many thousands of small seeds, normally in late spring. The seeds remain dormant over summer, with most germinating in the following autumn, but a small percentage of the seed will remain dormant for three years or longer.

Current Distribution

State and N&Y NRM region	Calomba daisy is most abundant in the Northern Adelaide Plains, especially the Hundreds of Dublin, Balaklava and Inkerman. It is scattered on northern Yorke Peninsula and the Mid-North, with a few infestations in the SAMDB NRM Region.
Yorke District	Calomba daisy slowly making its way around the top of Gulf St Vincent through Clinton Conservation Park, Clinton and Price. It may also be heading north and west around and through the Hummocks
Potential distribution	The areas where it may establish are sandy mallee soils and pastoral areas. It is most common on red or red/brown (gravelly) clay loams, or granite and limestone soils. Calomba daisy can also be found in seasonally inundated areas and clay pans. It has potential to spread as seed in hay, grain, pasture seed or cut flowers to other areas of the State. Calomba daisy is most commonly found in semi-arid sub-tropical regions. The major areas of risk are the lower rainfall cereal growing areas of Eyre Peninsula and the Murray Mallee.

Policy

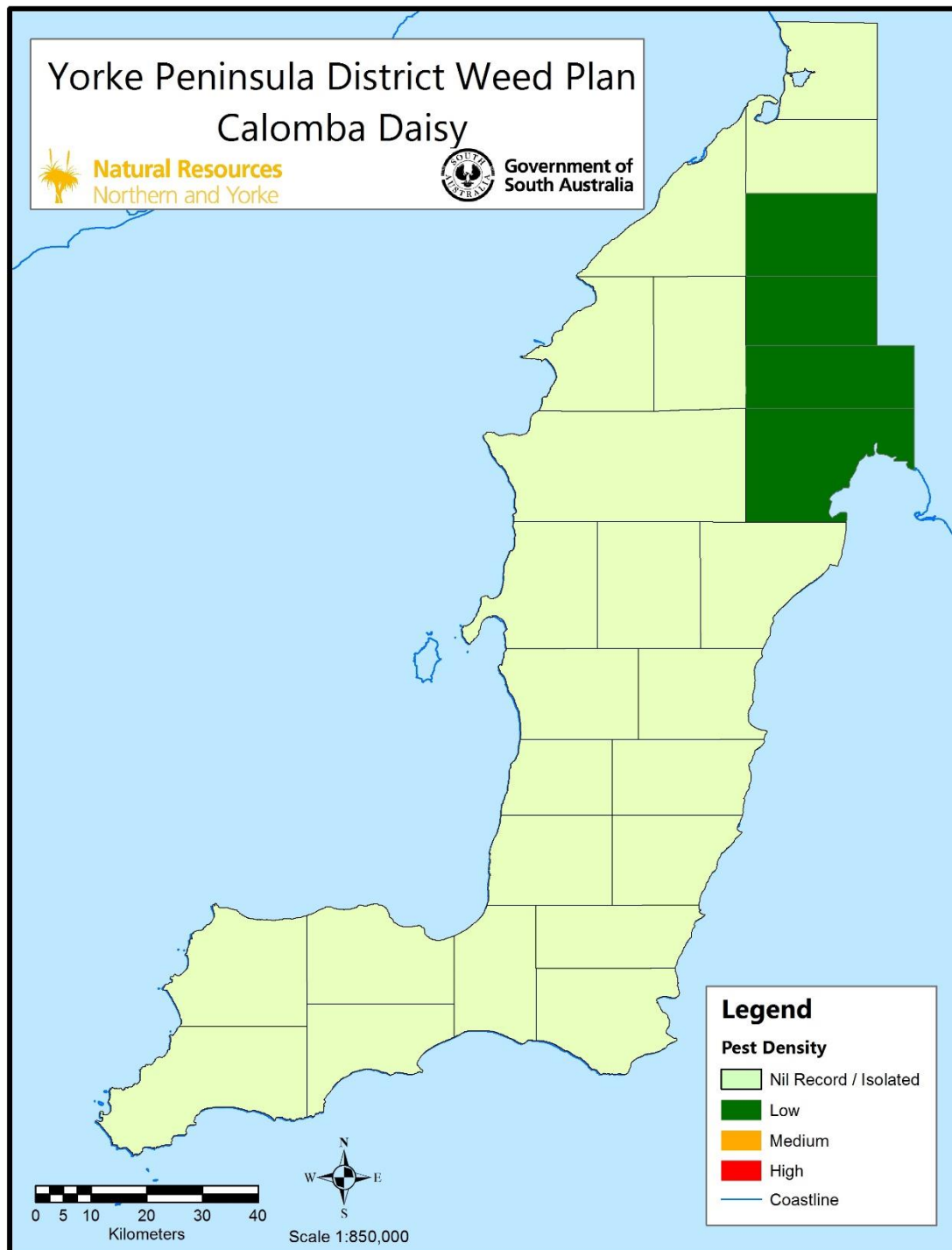
N&Y NRM Policy:	Declarations under the NRM Act: 175(2), 177(1), 177(2), 182(2), 185
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Yorke Peninsula District Action Plan

Justification for Action:

The Yorke District in line with N&Y Region Policy and management strategy is to Manage Weed and Priority sites infested with Calomba daisy with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of Calomba daisy.

- Establish a containment line as area of control between heavily infested areas and non-infested areas – containment line proposed as Clinton Conservation Park
- Educate landholders on their responsibilities for control of Calomba daisy
- NRM Notification Advices for non-compliance
- Control outlier Calomba daisy infestations



Caltrop (*Tribulus terrestris*)

Common name(s):	Puncture vine, gokshura, bai ji li, calthrop, yellow vine, goats head, bulls head, devil's thorn, devil's eyelashes, burra gokharu, Malta cross and Mexican sandburr	
Plant description:	Caltrop is a flat, sprawling, summer-growing, annual herb. The trailing stems of caltrop lie prostrate on the ground, radiating from a central taproot. The stems are reddish brown, wiry and covered with fine hairs. Caltrop has small divided leaves, arranged in pairs on opposite sides of the stem. The leaves are darker on the upper surface than on the lower. Each leaflet is about 5–12 mm long and 3–5 mm wide. Fine hairs, particularly on the underside, give a silvery appearance to the leaves. Flowers are produced from spring to autumn. Flowers are small, less than 1 cm in diameter, yellow and have five petals. The fruit of Caltrop is a woody burr with sharp rigid spines to about 6mm long. The burr splits into five wedge-shaped segments when ripe with each segment containing two unequal pairs of spines. Each fruit segment contains up to four seeds.	
Weed Risk Assessment Rating:	Urban	Manage sites
	Crop-Pasture Rotation	Manage weed
	Non-arable Grazing	Manage weed

Threats and Impacts

Invasiveness	Each caltrop plant can produce up to 4000 seeds, which disperse by attaching to livestock, produce, clothing or vehicles, and by soil movement (e.g. road grading, spoil dumping). Some seed readily germinates following rainfall events of at least 5mm in late spring and summer. The weed can flower within 21 days of emergence, and fruits can contain viable seed only 10 days after pollination. This short window of time to viable seed production, combined with the volume of seed produced and staggered germinations following summer rainfall presents many challenges for effective control.
Impacts	Caltrop is a major burry weed of urban areas, where it thrives on footpaths, sports fields and amenity areas due to lack of competition from other plants in summer. The burrs cause injury to feet even through footwear and puncture bicycle tyres, making caltrop a seasonal concern for local government. In dryland cropping areas caltrop grows on fallows and headlands after summer rain and especially on sandy soils. It can block seeding machinery, and like other summer fallow weeds it depletes soil moisture and nutrients. Caltrop occasionally impacts on livestock through burr-injury or poisoning, although this is increasingly uncommon. It is potentially toxic to sheep and goats, mainly by causing photosensitisation, also by accumulating nitrites under some conditions and containing harmala alkaloids although at much lower levels than African rue. However, livestock poisonings are very rare.
Persistence	The high seed production per caltrop plant enables it to maintain a population at very low densities, and also makes control difficult. Most of the seed has innate dormancy, with only one seed from a burr emerging at a time, and remains viable for 5 years or longer.

Current Distribution

State and N&Y NRM region	It is present in all NRM regions but there a number of areas have been identified by regional weed risk assessments as having potential for further expansion of caltrop distribution.
Yorke District	Infestations are present in urban townships within the Yorke Peninsula region
Potential distribution	Distribution of caltrop is limited by availability of water in summer; it has no winter growing period as it requires relatively high temperatures and is not frost tolerant. Areas with sandy soils and receiving frequent summer rainfall events greater than 5 mm are at higher risk of experiencing greater impacts from caltrop infestations.

Policy

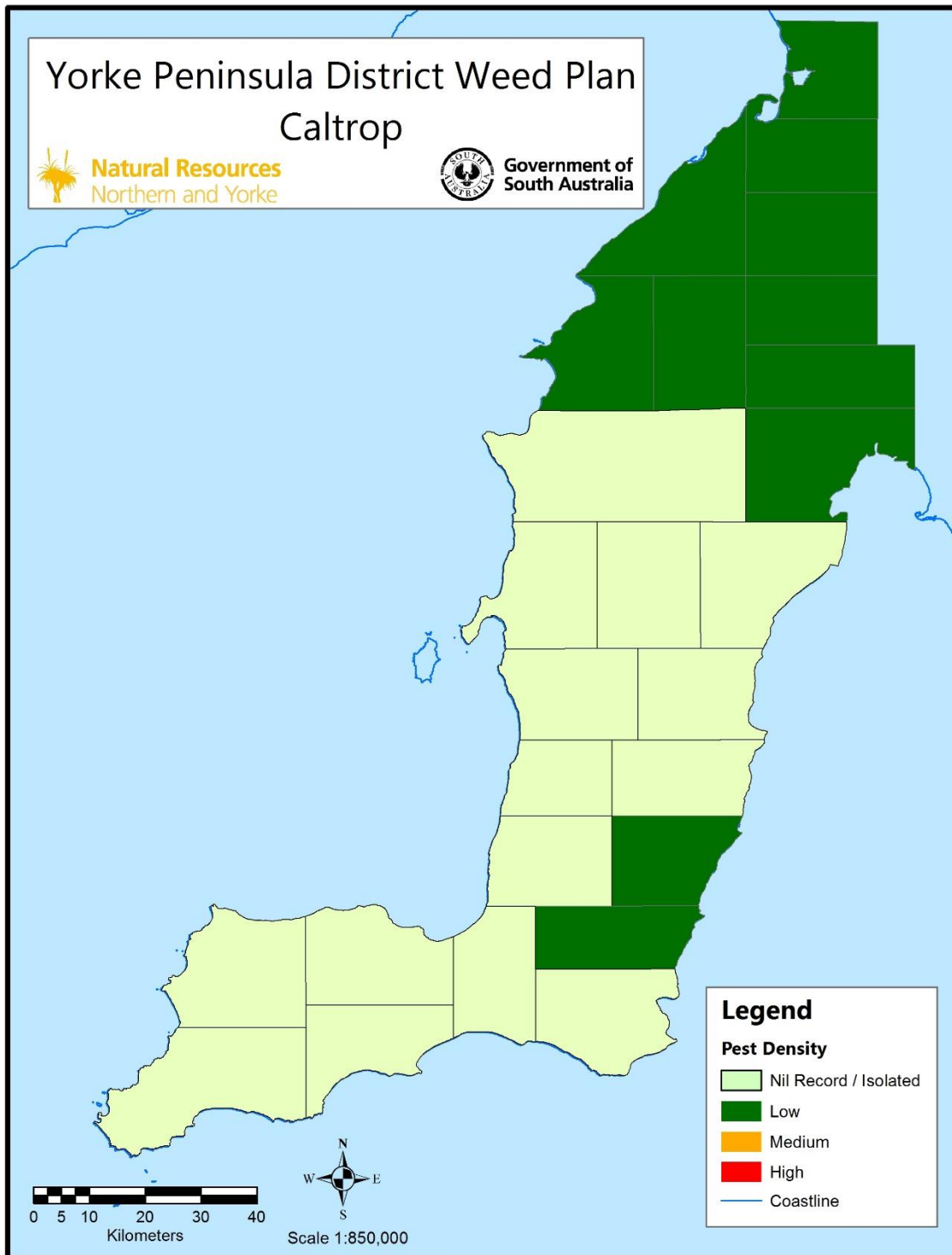
N&Y NRM Policy:	Declarations under the NRM Act: 175(2), 177(1), 177(2), 182(2), 185
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Yorke Peninsula District Action Plan

Justification for Action:

The Yorke District in line with N&Y Region Policy and management strategy is to Manage Weed and Priority sites infested with Caltrop with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of Caltrop.

- Support and collaborate with District Councils and their staff to instigate control programs in townships
- Educate landholders on their responsibilities for control of caltrop
- NRM Notification Advices for non-compliance.



Creeping Knapweed (<i>Rhaponticum repens</i>)		
Common name(s):	Hardhead thistle, hardheads and Russian knapweed	
Plant description:	<p>From Turkestan, introduced by contaminant of lucerne seed in 1929, Creeping knapweeds are erect perennial herbs growing to a height of 30 to 90 cm (mostly 45 cm). Plants leave a bitter tasting substance on hands when handled. Stems are erect from the centre of the rosette, stiff, branched and with a slightly woolly covering of soft grey hairs. They are dark-brown to black underground and at the base of the plant, while silvery-grey to dull grey-green above ground. Leaves are greyish or silvery-green with short hairs. The rosette leaves grow up to 15 cm long, 2-5 cm wide and are lance-shaped and toothed with stalks present.</p> <p>They have irregular-shaped lobes and are sparsely covered with glandular hairs. Stalks are covered in a fine down. Stem leaves alternate along the stem and are 5-7 cm long. Lower stem leaves have no stalks and are slightly dissected. Upper stem leaves are progressively smaller and not divided or lobed. Plants usually flower in their second year of growth in late spring and summer, flowers are in heads up to 2.5 cm in diameter when open. Heads are in solitary clusters on the ends of short, leafy branches. Florets are purple, pink or occasionally white and tubular. They are surrounded by broad, thin, spineless white or pale-yellowish bracts, with a thin papery tip. Seeds are whitish or ivory and sometimes mottled. They grow 3-4 mm long and 2-3 mm wide and are wedge-shaped and often slightly curved. Seeds have a pappus of numerous, stiff, barbed, white hairs which are loosely attached. Seed heads remain tightly closed and most seed is retained within the head. Seed can remain viable for a number of years under dry conditions.</p>	
Weed Risk Assessment Rating:	Crop-Pasture Rotation	Destroy Infestations
Threats and Impacts		
Invasiveness	<p>Creeping knapweed spreads by root and rhizome extension, forming slowly widening round patches around an initial point infestation. Fragments of this root system very readily produce new plants and may be spread within paddocks by cultivation and between properties by movement of vehicles and machinery. Creeping knapweed is an obligate out-crosser dependent on bees for pollination. It may also spread as seed, which normally falls within about a metre of the parent plant. The fruiting heads, containing several seeds, remains closed and are dispersed as a unit by water, contaminated seed and machinery, and animals (both internally and externally). Seed dispersal is of minor importance compared to vegetative spread, as seedlings of creeping knapweed are rarely found; possibly seed viability is low, or the conditions for successful seedling establishment are a rarely fulfilled.</p>	
Impacts	<p>Creeping knapweed is a strong competitor with crops for water and nutrients due to its root system. It is grazed in pastures, but is known to be toxic to livestock including sheep in some circumstances. Due to its deeper and more efficient root system, it has this long start over the crop and remains very competitive in the following cropping season; in dry years a heavy infestation can kill the cereal crop by water stress. It also suppresses the growth of other plants by allelochemicals.</p>	
Persistence	<p>As a deep-rooted perennial, creeping knapweed will persist indefinitely in crop/pasture paddocks unless it is systematically controlled. It tolerates moderate flooding and drought. The seeds are known to survive in soil for at least 5 years.</p>	
Current Distribution		
State and N&Y NRM region	<p>Creeping knapweed is scattered in the Eyre Peninsula, Kangaroo Island, N&Y, SAMDB and AMLR NRM regions but is absent from most land in these regions.</p>	
Yorke District	<p>Several reports of infestations in the Yorke region have been documented, and these sites are being monitored.</p>	
Potential distribution	<p>Creeping knapweed grows in areas receiving between 300-600mm annual rainfall, on a range of soil types from deep sands to mallee clay loams. Its potential range includes most of the</p>	

broad acre farming and horticulture zones of South Australia. However, it requires disturbance, e.g. by cultivation, erosion or earth movement, to establish. Its growth rate declines under shading and it does not compete well under a heavy canopy, and is weakened by dense shade.

Policy

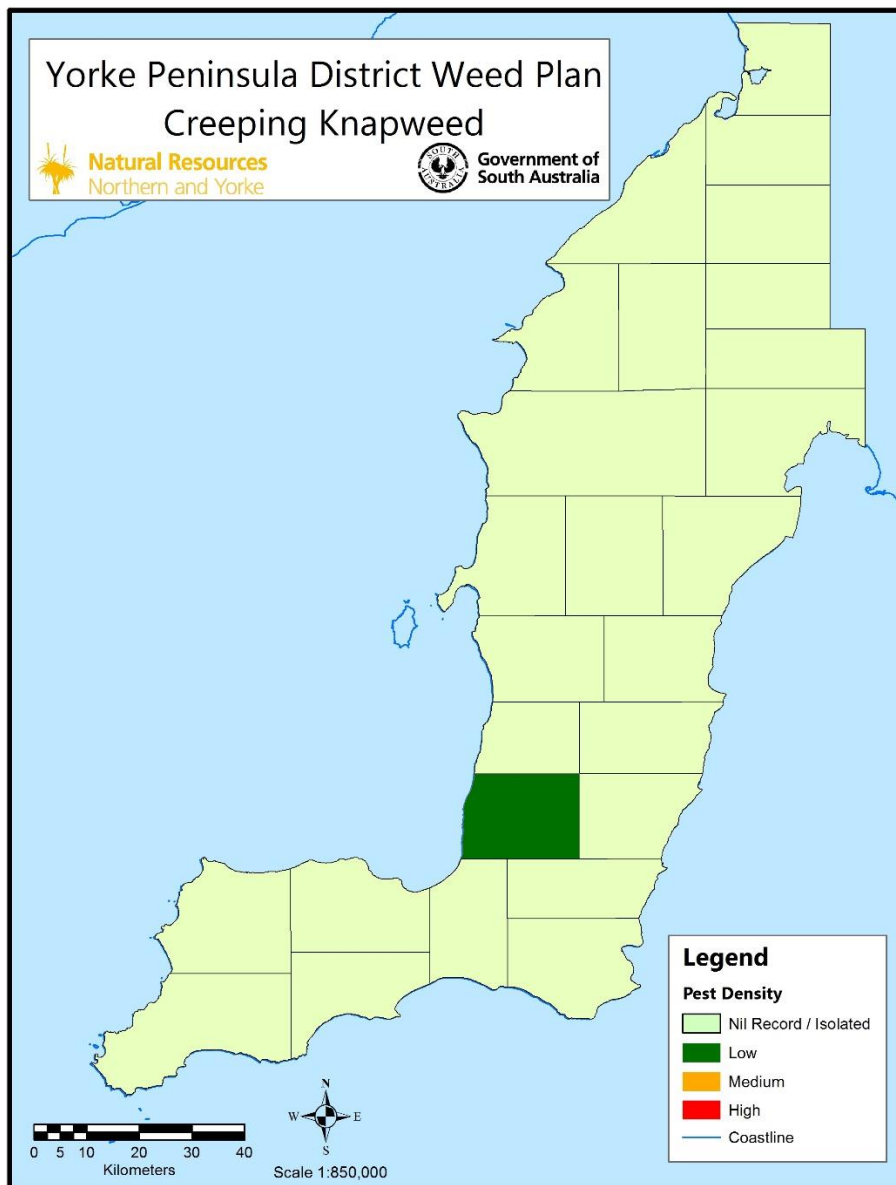
N&Y NRM Policy: Declarations under the NRM Act: 175(2), 177(1), 177(2), 180, 182(2), 185

Yorke Peninsula District Action Plan

Justification for Action:

The Yorke District in line with N&Y Region Policy and management strategy is to Destroy infestations with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of Creeping knapweed.

- Apply adequate resourcing to control Creeping knapweed
- Educate landholders on their responsibilities for control of Creeping knapweed
- NRM Notification Advices for non-compliance



Above: Creeping Knapweed flower www.agric.wa.gov.au

Alert species for the Yorke District, in the past it has shown up in a caravan park in Minlaton

Below: Creeping Knapweed rosette www.agric.wa.gov.au



Horehound (*Marrubium vulgare*)

Common name(s):	common horehound, hoarhound, houndsbane, malrove, marrubio, ou xia zhi cao and white horehound.	
Plant description:	Horehound was introduced as a medicinal plant by the first settlers and retains an established medicinal use in cough syrup and cough drops, as well as a much wider range of reputed medicinal properties. It is native to the Mediterranean region, temperate Eurasia, and the Middle East and was naturalised in Australia by 1848. Horehound is a spreading, bushy, aromatic perennial weed growing to 80cm with a similar shape and form to lavender. The stems are square and covered with white, cottony hairs. Horehound has velvety, near-circular green-grey leaves in opposite pairs. They are deeply veined and wrinkled with toothed edges and are covered with white, cottony hairs, especially on the lower leaf surface. Small white flowers are produced during summer and autumn in dense whorls in the leaf axils along the upper part of the shoot. Up to 4 seeds per burr, 1-2mm long	
Weed Risk Assessment Rating:	Urban	Manage sites
	Native Vegetation	Manage sites
	Non-arable Grazing	Manage weed

Threats and Impacts

Invasiveness	In Australia, horehound grows into larger plants with higher seed production than in its native range, producing up to 10,000 seeds annually per square metre. Its small burrs are well adapted to attach to wool, fur, clothing and similar materials. Sheep, rabbits, kangaroos and emus can easily spread the burrs, which also adhere to vehicles. Water is also an effective dispersing agent, as may be seen along water supply channels in many areas. Horses are known to eat and pass the seeds in a viable condition in faeces. Horehound is an opportunistic germinator, with most seeds germinating in response to autumn rainfall, but some delayed germination occurs throughout winter and spring whenever sufficient water is available. Horehound will grow on very poor soils and is often a pioneer species colonising eroded areas. Infestations may begin on road verges, channel banks, sheep camps and rabbit warrens, from which they encroach into pastures, disturbed native vegetation and occasionally crops.
Impacts	Horehound is unpalatable to stock and is regarded as fodder only in the pastoral zone. It forms dense populations under high grazing pressure in marginal pastures. The burrs contaminate wool, reducing the value of fleeces, and are a nuisance as they catch in clothing and socks. The meat of animals that are forced to eat horehound is tainted by its strong flavour.
Persistence	Horehound infestations form a bank of 5,000-15,000 viable seeds per square metre, with individual seeds surviving in the soil for 7-10 years. Although the plants are short-lived perennials that die off during dry years in areas with less than 350 mm annual rainfall, they regenerate densely from seed when wet conditions return. Seedling regeneration also occurs after herbicide treatment. Fire will kill all mature plants and reduce the seed bank by up to 80%. In unimproved permanent pasture, the seed bank may be reduced by autumn control burning in several successive years and reduction in grazing pressure.

Current Distribution

State and N&Y NRM region	Horehound has spread to its limits in SA, being widespread in all settled and pastoral areas with at least 200 mm annual rainfall.
Yorke District	Widespread
Potential distribution	Horehound is adapted to a Mediterranean climate similar to conditions across the southern half of SA where annual rainfall exceeds 200 mm. It grows on neutral to alkaline soils, is resistant to levels of frost found in SA, and can survive summer droughts.

Policy

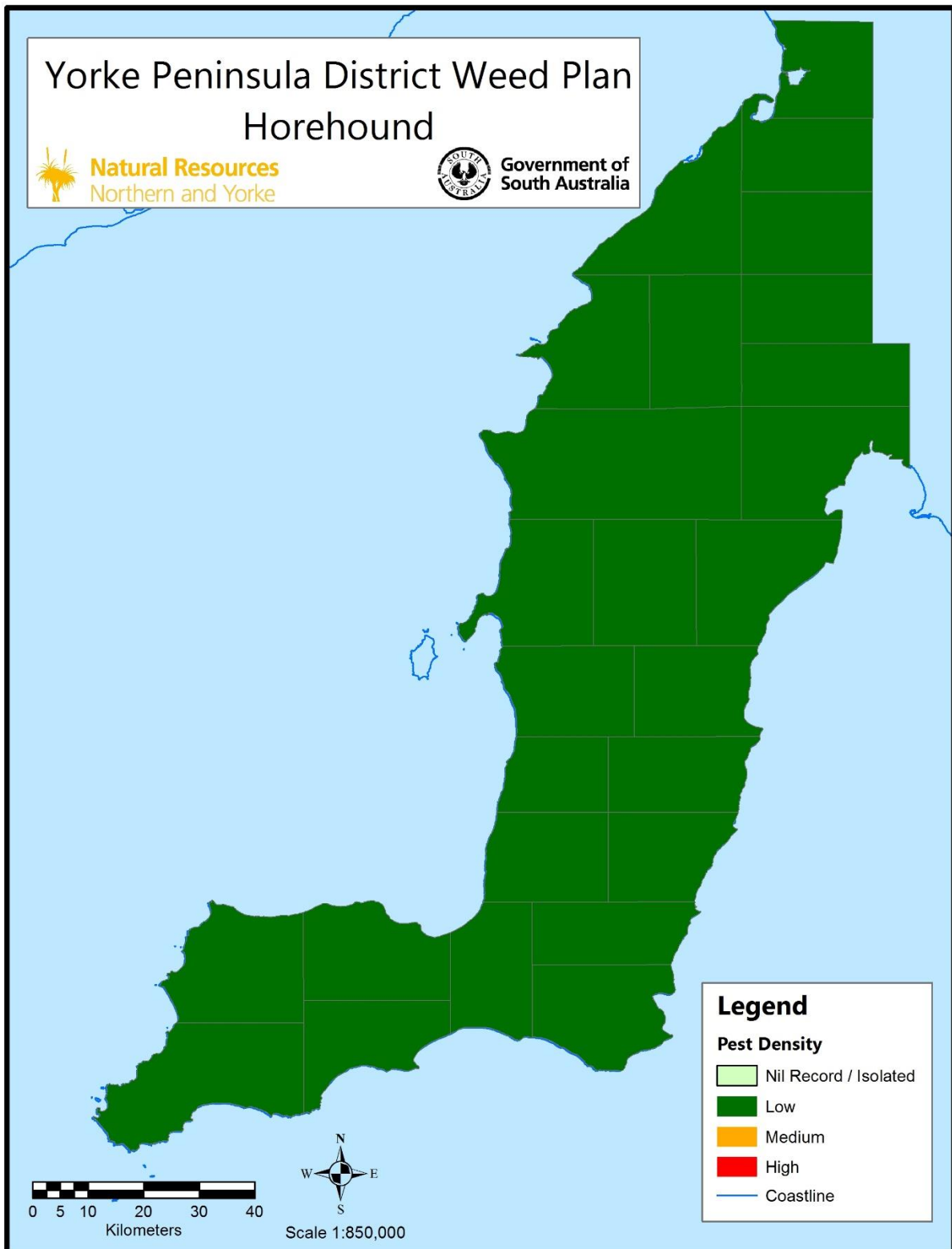
N&Y NRM Policy:	Declarations under the NRM Act: 175(2), 177(1), 177(2), 182(2), 185
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Yorke Peninsula District Action Plan

Justification for Action:

The Yorke District in line with N&Y Region Policy and management strategy is to Manage Weed and Priority sites infested with Horehound with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of Horehound.

- Educate landholders on their responsibilities for control of Horehound
- NRM Notification Advices for non-compliance



Khaki weed (<i>Alternanthera pungens</i>)		
Common name(s):	Khaki weed	
Plant description:	Khaki weed is a prostrate summer-growing perennial with spiny burrs.	
Weed Risk Assessment Rating:	Urban	Destroy Infestations

Threats and Impacts

Invasiveness	Khaki weed has high seed production. Seed is carried in prickly burrs are easily moved and transported. This weed colonises bare or disturbed areas and occasionally establishes in unsown dryland pastures. Infestations also increase in size through the long prostrate stems rooting at the nodes.
Impacts	The major problems currently caused by khaki weed are due to its spiny burrs. It establishes in parks, lawns and ovals especially if these are watered in summer, reducing their amenity value. The burrs cause mechanical damage to the feet and mouths of stock; they are recorded as vegetable fault in wool and have been associated with dermatitis in humans. However, the land use at greatest risk is irrigated pasture.
Persistence	Khaki weed is a difficult plant to control as it is deep-rooted, the tap root also allowing it to survive periods of drought. It also forms a soil seedbank under infestations, with seed surviving for more than 5 years.

Current Distribution

State and N&Y NRM region	Increasing number of infestation in the Lower Mid-North and Southern Flinders Upper North Districts associated with vehicle and people movements.
Yorke District	Not recorded
Potential distribution	Khaki weed is native to tropical and subtropical regions of Central and South America. In Australia it is recorded as a weed in similar climates and mainly on light soils in areas. Although growth is proportional to summer rainfall, experience shows khaki weed can establish anywhere across the agricultural zone of SA and in the Adelaide area.

Policy

N&Y NRM Policy:	Declarations under the NRM Act: 175(1), 175(2), 177(1), 177(2), 180, 182(1), 185
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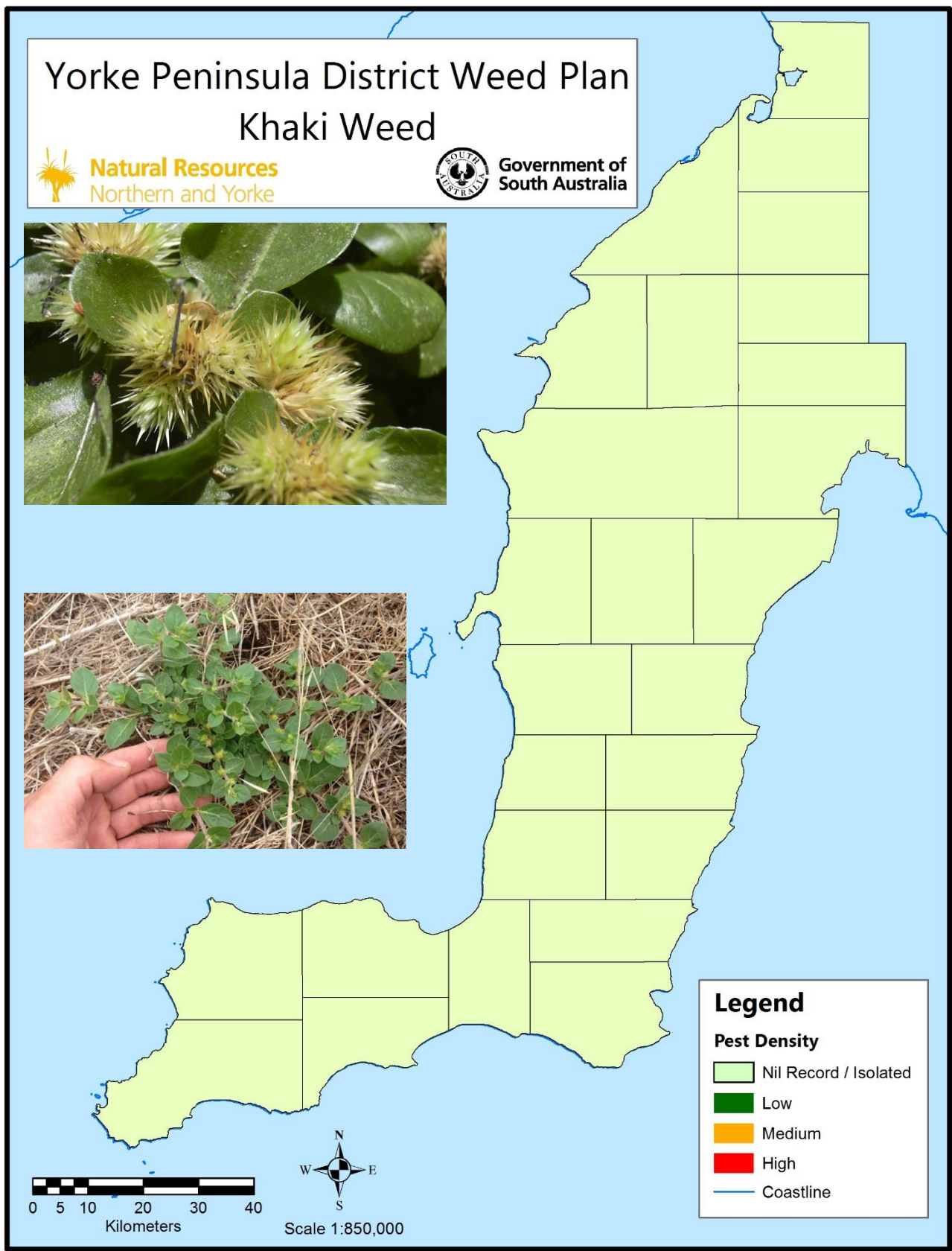
Yorke Peninsula District Action Plan

Justification for Action:

The Yorke Peninsula is currently free of recorded infestations for Khaki weed. However this is unlikely to continue as the number and size of infestations within districts that border it grow annually. Given the large number of tourists and visitors that come to the area in the summer months it is critical that Khaki weed be prevented from becoming established. As most infestations are linked to public amenities, road maintenance activities and traveller rest areas the focus of inspections and education will centre upon these linkages.

- Promote awareness of alert weeds including khaki weed.
 - Minimum of one media release per year.
 - Ensure that council staff are familiar with the plant.
- Landowners to report infestations.
 - District staff to record data and notify NRM Biosecurity of new infestations.
- Regularly inspect public areas for infestations throughout the summer growing period:
 - Caravan parks, camping grounds and parking bays
 - Parks and gardens
 - Ovals and School Ovals
 - Roadhouses
- Landholders to destroy infestations growing on land they occupy.
- Staff to ensure all infestations on public or private land are destroyed.

- Known infestation sites to be monitored.
- Urban properties to be surveyed that are in proximity to recorded infestation.
- Infestations on road reserves to be destroyed:
 - Road reserves to be inspected for new infestations.
 - Known sites to be inspected and treated as required.
- Infestations size and densities to be mapped.



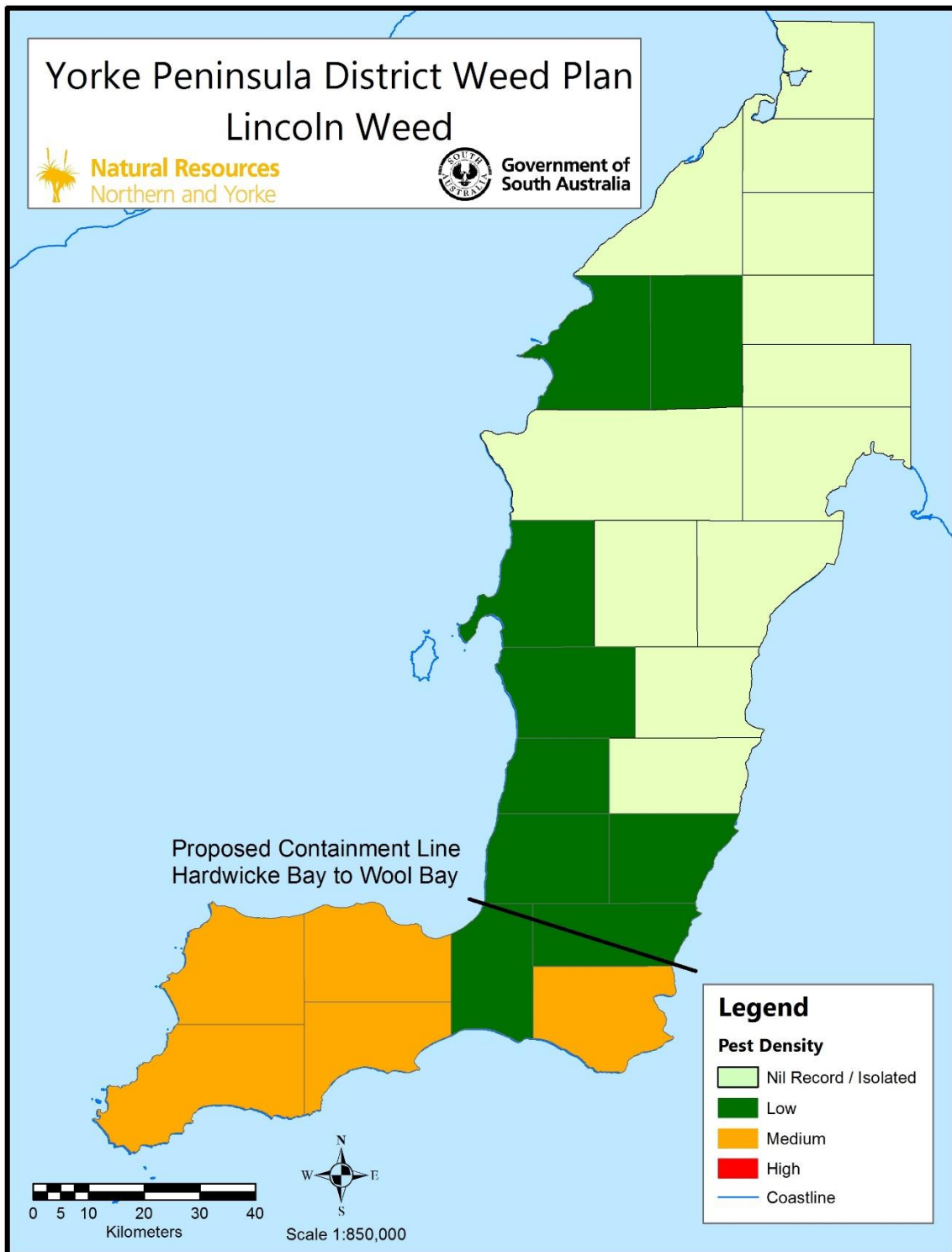
Lincoln Weed (<i>Diploaxis tenuifolia</i>)		
Common Name(s):	Arugula sylvetta, perennial rocket, rucola selvatica, sand rocket, wild arugula and wild rocket	
Plant description:	Lincoln weed reached South Australia sometime before 1879 from Europe/western Asia. Introduced to South Australia for fodder and soil stabilisation, and now naturalised. Although of some use in marginal country, it is a competitive weed in cropping and improved pastures. It is an erect branching perennial herb 30cm-1m high. Leaves are dark green and fleshy, mainly on the lower stems. Lower leaves 10-15cm, are slender, hairless end in segments; upper leaves are smaller and less divided. Can flower all year round, flowers are bright yellow with four petals 8-15mm long, at the end of the stems in small clusters. Fruit is a cylindrical pod 2-5cm x 1-2mm containing 50-80 egg-shaped seeds in two rows.	
Weed Risk Assessment Rating:	Crop-Pasture Rotation	Manage sites
	Non-arable Grazing	Monitor
Threats and Impacts		
Invasiveness	Lincoln weed evolved on coastal dunes, a habitat that is continually disturbed as the sand moves. Although perennial, it needed to regenerate frequently to occupy bare sand patches and consequently it has a deep root system that allows it to grow during summer and persist in sites where lucerne and other pasture plants die out. It is an out-breeder pollinated by insects, with production of small seeds. Most spread is by seed although cultivation and soil carried on earthmoving equipment may spread root fragments in the soil. Seed is probably spread in soil, fodder and cereal screenings; spread by livestock may also occur.	
Impacts	Lincoln weed reduces the value of fallows by using nutrients and moisture reducing their availability to the crop, even if its density is reduced by herbicides. It can impede cultivation, especially in low trash tillage management. It competes with more valuable forage in pastures, especially irrigated pasture, and reduces the value of meat by tainting with its strong taste. Green Bridge and Harbours Insect Pests need info on this	
Persistence	As a deep-rooted perennial, Lincoln weed will re-emerge from rhizomes after any single control treatment and also persists as seed in soil. Its root system enables it to grow during summer and persist where lucerne and other pasture plants die off. Its seed is easily separated from cereal and most pasture seed because of its small size.	
Current Distribution		
State and N&Y NRM region	Present in large areas of the state, especially western Eyre Peninsula, SYP and the Upper North.	
Yorke District	Widespread on SYP, not as widespread on UYP. Along roadsides in the centre of the peninsula which is raising concern.	
Potential distribution	Lincoln weed is most abundant in shallow skeletal soils over calcrete/limestone and calcareous sands, and avoids acidic or heavy soils. Its potential range extends across the agricultural zone of South Australia to other lucerne and rotational crop/pasture areas but not beyond the southern edges of the pastoral zone.	
Policy		
N&Y NRM Policy:	Declarations under the NRM Act: 175(2), 177(1), 177(2), 182(2), 185	

Yorke Peninsula District Action Plan

The Yorke District in line with N&Y Region Policy and management strategy is to Manage Weed and Priority sites infested with Lincoln weed with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of Lincoln Weed.

- Establish a containment line as area of control between heavily infested areas and non-infested areas – containment line proposed between the foot of SYP and the leg of YP

- Promote awareness of Lincoln weed, roles and responsibilities of landholders outside of heavily infested areas and landholders within heavily infested areas.
 - Minimum of one media release per year.
 - Ensure that council staff are familiar with the plant.
- Infestations on road reserves north of containment line to be controlled:
 - Road reserves to be inspected for new infestations.
 - Known sites to be inspected and treated as required – roadside notification advice and/or cost recovery process.
- New infestations size and densities to be mapped.



Silverleaf Nightshade (*Solanum elaeagnifolium*)

Common name(s):	Bull nettle, white horse nettle, tomato weed, bitter apple and sataansbos	
Plant description:	Silverleaf nightshade is an erect summer perennial herb growing to a height of 80 cm. Stems of silverleaf nightshade are erect with many branches and densely covered with fine star-shaped (stellate) hairs which give them a silver-white appearance. They also usually have numerous slender, yellow to red prickles 2-4 mm long. Leaves are silvery white due to a dense covering of stellate hairs and denser on the under surface. Alternate, lanceolate to oblong, growing to 15 cm long (usually about 6-10 cm) and 1-2 cm wide. Stalked, often with prickles on the underside of veins with undulating margins and often scalloped. Silverleaf nightshade flowers November through to February and are purple to violet or occasionally white and grow to 3.5 cm in diameter. They consist of five fused petals with five yellow, long and tapering anthers. The fruit of silverleaf nightshade is a smooth globular berry.	
Weed Risk Assessment Rating:	Crop-Pasture Rotation	Contain Spread
	Perennial Horticulture	Manage sites

Threats and Impacts

Invasiveness	Silverleaf nightshade will easily establish among existing plants under suitable conditions, which usually occur in years with an unusually high summer rainfall. Its initially small seedlings are vulnerable to drought until they get roots down to the subsoil. Seed is most commonly spread by the movement of livestock but can also be dispersed by wind, water, agricultural machinery and tools, as well as in feed, some grains and vehicles. Wind can also blow mature plants with attached berries along the ground. Within a paddock, root fragments can be spread by cultivation and form new infestations.
Impacts	Silverleaf nightshade impacts significantly on cropping and pastures, by reducing yield and carrying capacity, and sometimes land values. It competes directly with summer crops and indirectly with winter crops by reducing available moisture and nutrients. Annual winter pastures are affected through delayed autumn emergence and lower productivity, resulting in reduced carrying capacity. On the Eyre Peninsula, yield losses range from 5-15% in heavy red clays to 30-50% in light sandy soils. When infestations are heavy in pastures, the closed canopy cover restricts available light for other vegetation, and restricts access of stock to the feed below. Infestations of silverleaf nightshade increase production costs through control requirements and reduce return and productivity of land. All parts of the plant, but particularly the berries, are potentially toxic to animals but poisoning rarely occurs in South Australia.
Persistence	Established plants are adapted to a wide range of habitats, are highly resistant to drought and tolerant of saline conditions but are sensitive to frost and water logging. Regeneration from dormant buds on established roots is the most important method of multiplication. Root fragments can regenerate even buried up to 20 cm deep and from pieces as small as 0.5 cm long when soil moisture conditions are suitable. Removing aerial parts of the plant encourages sprouting, and seedlings as young as 10 days old can regenerate. Seeds may last up to 10 years in the soil. High numbers of seedlings are only occasionally observed, as seeds have specific moisture and temperature requirements for germination that usually occur in late spring to early autumn. Seed germination is thought to be enhanced by passage through the gastrointestinal tract of animals. As germination is infrequent, extensive viable seed banks may quickly build up.

Current Distribution

State and N&Y NRM region	Silverleaf nightshade occurs in all regions of the State. It is most widespread in the agricultural areas of the Mid North (in excess of 100,000 ha),
Yorke District	Isolated infestations south of the Copper Coast Highway, increasing in density further north and towards the Lower Mid-North District.
Potential distribution	Silverleaf nightshade has the potential to grow across most of the cropping and grazing land uses in the State, especially those areas with a cool, wet winter and hot dry summer. It thrives

on disturbed land and will inhabit warm temperate regions in areas with 250-600 mm annual rainfall.

Policy

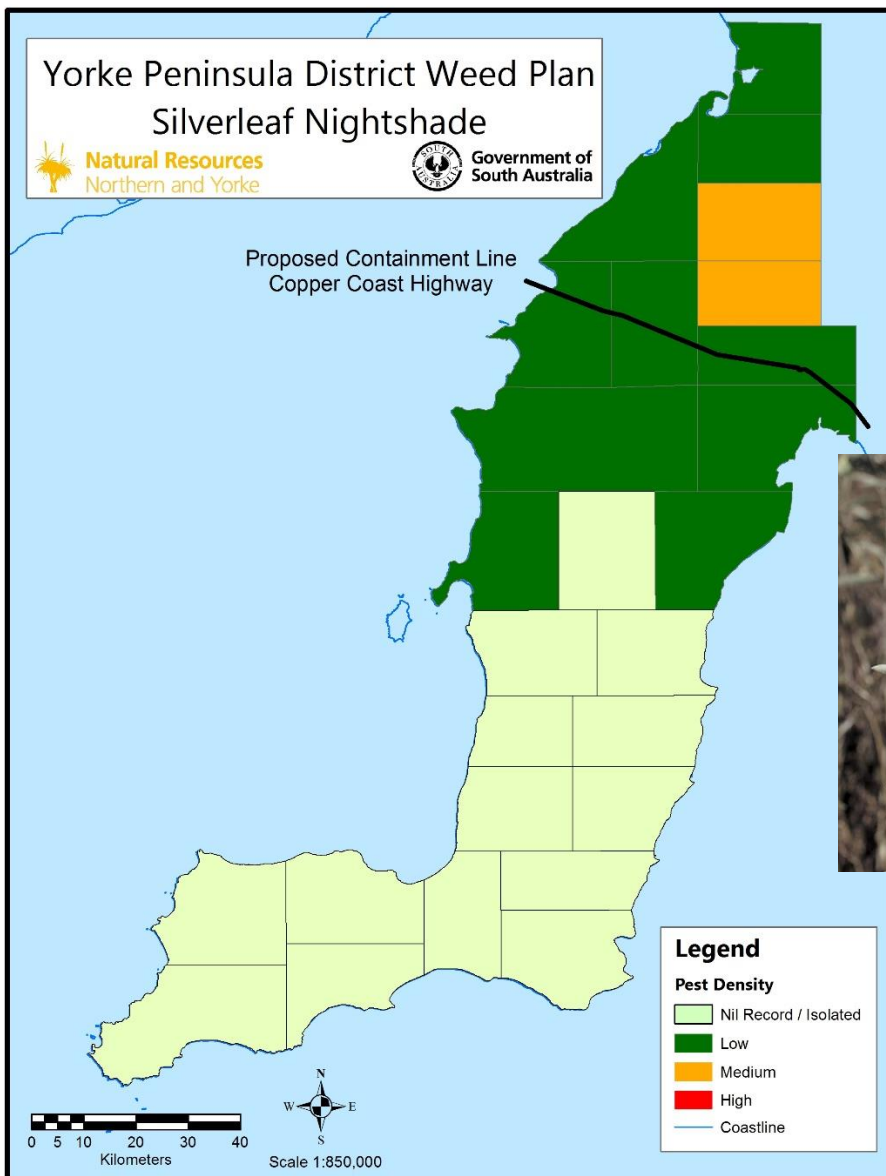
N&Y NRM Policy: Declarations under the NRM Act: 175(2), 177(1), 177(2), 182(2), 185

Yorke Peninsula District Action Plan

Justification for Action:

The Yorke District in line with N&Y Region Policy and management strategy is to Contain and control Priority sites infested with Silverleaf nightshade with the aim to maintain economic, environmental and/or social values of key sites/assets through improved management of Silverleaf nightshade.

- Establish a containment line as area of control between heavily infested areas and non-infested areas – containment line proposed as Copper Coast Highway
- Educate landholders on their responsibilities for control of Silverleaf nightshade
- NRM Notification Advices for non-compliance



Example images of Silverleaf Nightshade



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Buffel Grass PIRSA Website - http://www.pir.sa.gov.au/biosecurity/weeds_and_pest_animals/weeds_in_sa/weed_id/plant_id_notes/buffel_grass
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- SAAL District Weed Plans and Strategies - <http://www.naturalresources.sa.gov.au/aridlands/plants-and-animals/pest-plants-and-animals/pest-plants>
- Silverleaf Nightshade Australian Best Practice Management Manual - http://www.pir.sa.gov.au/_data/assets/pdf_file/0003/334632/Silverleaf_Nightshade_Australian_Best_Practice_Management_Manual.pdf
Silverleaf Nightshade WoNS Strategic Plan - http://weeds.ala.org.au/WoNS/silverleafnightshade/docs/SLN_Strategic_Plan_030613.pdf
- PIRSA Weed Risk Management Guide (2008) - http://pir.sa.gov.au/data/assets/pdf_file/0016/254221/sa_weed_risk_management_guide.pdf
- Northern and Yorke NRM Board's Operational Process for Achieving Sustainable Natural Resource Management in the Region (Foundation – Information and Incentives – Voluntary Remediation – Compliance System); http://directorates.ishare.env.sa.gov.au/sites/ADM135/TRIM_Records/NY-FNY2009-00021/NY_IIC_PMS.docx
[rec_43546.DOCX](http://directorates.ishare.env.sa.gov.au/sites/ADM135/TRIM_Records/NY-FNY2009-00021/NY_IIC_PMS.docx)

Northern & Yorke Natural Resources Management Board

Yorke District

Roadside Declared Plant Control Policy

Background

The control of declared plants on road reserves has long been the responsibility of former authorities such as Pest Plant Boards and Animal & Plant Control Boards with declared plant management now contained within the Natural Resources Management Act, 2004.

The reasonability's of the Yorke District of the Northern & Yorke Natural Resource Management Board in respect to managing declared plants on road reserves is contained within the following sections of the act as detailed below:

Sec 82 Owner of land to take action to destroy or control animals or plants

Sec 182,(7) All NRM groups must carry out proper measures for the destruction of all animals or plants of a class to which subsection (1) applies and for the control of all animals or plants of a class to which subsection (2) applies on road reserves situated within both a control area for that class of animals or plants and the area of the NRM group (and, if there is no such group, the responsibility to take action under this subsection will rest with the relevant regional NRM board).

Sec 185 NRM authorities may recover certain costs from owners of land adjoining road reserves

- (1) *If an NRM authority carries out on road reserve measures for the destruction or control of animals or plants of a class to which this section applies, the NRM authority may, within 3 months, give notice in writing to each owner of land adjoining the road reserve requiring the owner to pay to the NRM authority an amount specified in the notice within a period specified in the notice, being not less than 28 days from the date of the notice.*
- (2) *Subject to subsection (3), the amount specified in a notice under subsection (1) directed to an owner of land must be the amount determined by the NRM authority to be the costs and expenses incurred by the NRM authority in carrying out the measures referred to in subsection (1) on the section of road reserve adjoining the owner's land up to the middle of the road reserve.*
- (3) *Despite subsection (2), an NRM authority may, from time to time, fix a standard charge and determine the circumstances in which the standard charge is to apply (being a standard charge not exceeding an amount determined on the basis for the time being fixed by the Minister), and, if those circumstances apply in relation to an owner of land, the amount specified in a notice under subsection (1) directed to that owner will be the standard charge.*
- (4) *If an amount is not paid by an owner of land within the period within which it is required to be paid under this section, the owner is liable to pay interest charged at the prescribed rate per annum on the amount unpaid.*
- (5) *An amount payable to an NRM authority by an owner of land under this section (including any interest charge) may be recovered by the NRM authority as a debt.*
- (6) *An NRM authority may, if it is satisfied that just and proper grounds exists for it to do so, remit the whole, or part, of any amount payable by a person under this section*

It is the sole responsibility of the Board to coordinate control measures of declared plants on road reserves and from an operational perspective the adjoining landholder is given no authority or permission to conduct this work by the Board. Therefore, there is an administrative responsibility and process for the Board and its delegates to facilitate landholders who wish to control declared plants on the road reserve gain authority to do so.

The Board and/or its delegates coordinate this process with the Local Councils in their district, because pursuant to section 221 of the Local Government Act (1999), at times local government may give a blanket permission to landholders to conduct control activities on the road reserve (refer attached sample – Appendix B) for a specific time period.

1. Type of acceptable control measures

Preferred practices for the control of declared plants on road reserves focus upon the selective and careful treatment of plants causing minimal damage to surrounding vegetation with special care to be observed at significant sites (i.e. significant remnant vegetation).

Un-acceptable methods of Control: the N&Y NRM Board discourages the use of total, non-selective control methods that may damage or destroy other competitive, native or desirable vegetation. These methods may include but not be limited to:

- Ploughing of roadsides
- Burning of roadsides
- Total vegetation/blanket spraying of roadsides

The use of these methods by adjoining landholders may constitute a breach under the Native Vegetation Act. 1991.

2. Advice Notice

Compliance officer may advise landholders of the presence of proclaimed plants on road reserves adjoining their properties. This practice informs them of the type of plant present and that the Board will be including the control of such plants within its roadside control program from a given date. The attached advice notice (Appendix C) is a standard format that has been adopted by the administration to forward to adjoining landholders when required.

Operationally these are forwarded to the public when a weed is:

- new to the area and presence needs to be conveyed to the adjoining landholder
- the landholder may be new to the area or known to be new to rural property ownership
- the potential cost burden needs to be communicated to the adjoining landholder
- the landholder may be an absentee
- the work-load of the officer allows for the dispatch of such advices

3. Compliance Officer Discretion

Compliance officers shall have discretion in relation to the need to control certain declared plants on road reserves as situations arise. There may be occasions where the presence of plants is very minor in nature or the control of the plants may have greater benefit to the broader community compared to passing on this cost to the individual.

4. Roadside Control Programs

It is recognized that, given the finite resources of the Board, not all declared plants on road reserves throughout the Yorke District area are able to be controlled in a given season.

The Board and District Staff will develop co-coordinated programs and set priorities for the control of declared plants on road reserves.

Control programs and the timing of the Boards control activities on road reserves shall be communicated to the public prior to their implementation.

Example of Roadside Control Program timeline

District Staff to plan coordinated weed control programs	Notify Landholders in area of control about N&Y intent for Roadside Control for weed species in district weed plan	Inspect roadsides in control area (e.g. Hundred) from plan in week 0 for weed species in district weed plan	Roadside Notification Advice and educational letters to landholders as required	Monitor and Media?	Re-inspect and control
Week 0	Week 1	Week 2	Week 3	Week 3-6	Week 7-8

5. Chargeable Activities

Although most chargeable control activities by the Board is via the chemical treatment of plants using the Boards resources, there may be occasions when an alternative method of control may be more appropriate (i.e. grubbing, burning, physical removal, etc.).

These control methods may also be considered as chargeable activities and the cost of such actions to be charged to the adjoining landholder for that portion of road reserve controlled.

Authorisation for Weed Control on Road Reserve

Pursuant to Section 221 of the Local Government Act 1999, it is an offence to make an alteration to a public road which includes the interference with vegetation on a road or the removal of vegetation from a road without an Authorisation to do so from the relevant council.

For the purpose of controlling proclaimed plants on the roads in their area, the **>>Relevant Council<<** hereby authorises land owners adjoining a road reserve in their Council areas who would otherwise be responsible for the payment of costs and expenses of such removal to the Northern & Yorke Natural Resources Management Board, to remove from the road reserve the declared plants and only the declared plants pursuant to the Natural Resources Management Act, 2004.

Before undertaking any such removal, the land owner must consult with the Northern & Yorke Natural Resources Management Board. The land owner shall accept full responsibility for, and must ensure that any weed control activity, including the use of chemicals /or spraying, does not interfere with, or cause damage to the road reserve, other vegetation or in any way affect the property of any other person.

This notice is valid for the period **>>Date<<** up to and including **>>Date<<** unless revoked by further notice.

***** **Chief Executive Officer, ***** Council**

Appendix C

«Contact»

«ContactAddress1»

«ContactAddress2»

«ContactSuburb» «ContactState» «ContactPostCode»

Date: «CurrentDate»

Declared Plants on Road Reserves

Dear Landowner,

During an inspection of your district the following declared plant/s were noted growing on the half road-width adjoining your property being: Lot/Sec: «LotNumber»; Hundred: «Hundred».

Declared plant/s: «**Pest**» («**PestScientific**»)

Under the *Natural Resources Management Act, 2004*, s.182(7) the relevant NRM (Natural Resources Management) authority is responsible for the control of declared plants and animals on road reserves and under s.185(1) the cost of controlling declared plants and animals on road reserves is recoverable from the adjoining landowner by the NRM Board.

You are advised that the NRM Board will be commencing its roadside control program in the above area on or after «**CompletionDate**».

Control undertaken by the NRM Board will use the following preferred method/s;

<Insert Herbicide>

- If you intend under local government authorisation, to carry-out declared plant control on road reserves adjacent your property yourself, you are reminded;
 - (1) Of your responsibility to minimise off target damage to native vegetation and neighbouring properties.
 - (2) Of the need to notify the NRM Authorised Officer that the work has been completed.

Should you require clarification of any issues in relation to this notice or seek control advice please make contact me at your earliest convenience.

Yours sincerely,

«**Inspector**»

NRM Regional Authorised Officer