Northern and Yorke Natural Resource Management Board
Lower and Mid North NRM District
Weed Action Plan
February 2019

Natural Resources
Northern and Yorke

Government of South Australia

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 Lower and Mid North 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

This district action 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 Lower and Mid North District that aim to reduce the current and potential impacts of eleven priority weeds.

The management actions outlined for each of the twelve 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, 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**

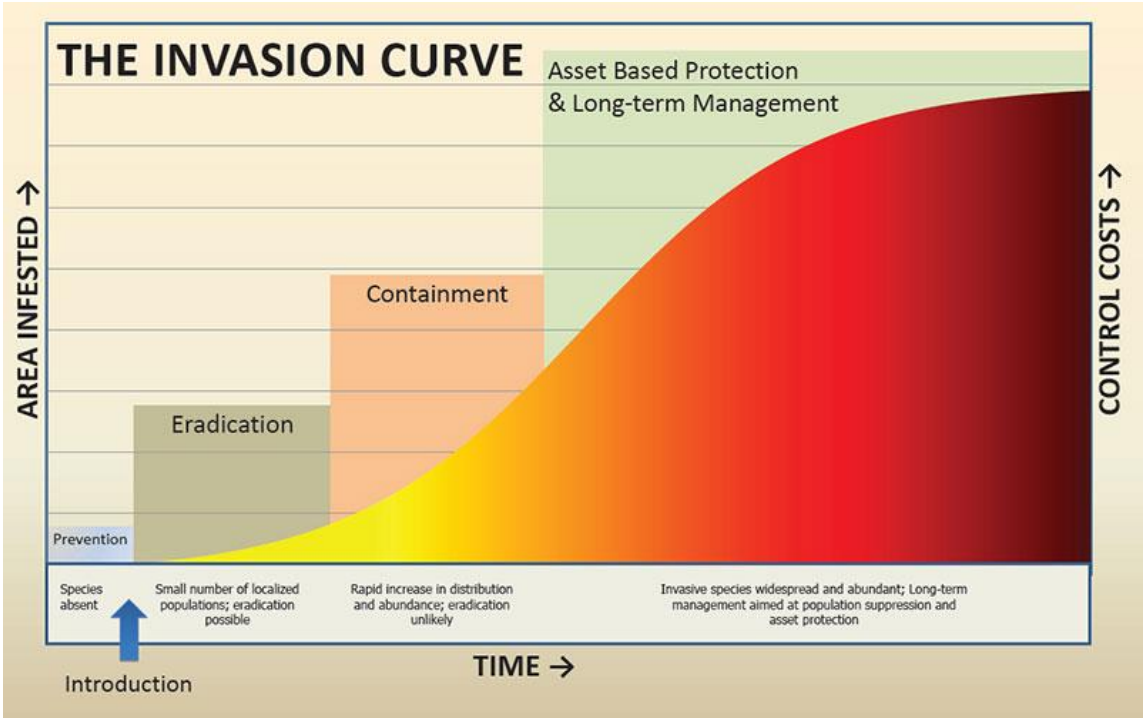


Figure 1. Generalised invasion curve showing actions appropriate to each stage of invasive species (http://www.mda.state.mn.us)

Alert species have the highest priority in the district and should be reviewed by the district staff annually, and any situation or legislative changes actioned and communicated to the district's key stakeholders e.g. Northern Areas Council, Port Pirie Regional Council, Wakefield Regional Council, Regional Council of Goyder, Clare and Gilbert Valleys Council, Agricultural Bureaus, Agronomists, Government Departments (e.g. SA Water, DPTI), and the 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 the Lower and Mid North 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 Mid North Horizons Community Action Planning (CAP) workshops have helped to determine priority target weed species for specific locations on the Lower and Mid North using this process of risk assessment. This plan aims to assist the community to protect assets identified through the Mid North Horizons CAP, a process which coordinates 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 Lower and Mid North 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 <u>not being</u> 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.

Priority Weed	Management strategy
African Boxthorn *(Lycium ferocissimum)*	Manage Sites
African Rue *(Peganum harmala)*	Protect Sites
Boneseed (*Chrysanthemoides monilifera* ssp. *monilifera*)	Destroy Infestations
Bridal Veil (*Asparagus declinatus*)	Destroy Infestations
Buffel Grass (*Cenchrus ciliaris*, *Cenchrus pennisetiformis*)	Contain Spread
Coolatai Grass *(Hyparrhenia hirta)*	Destroy Infestations
Creeping Knapweed (*Rhaponticum repens*)	Destroy Infestations
Horehound *(Marrubium vulgare)*	Manage Sites
Khaki Weed *(Alternanthera pungens)*	Destroy Infestations
Silverleaf Nightshade (*Solanum elaeagnifolium*)	Contain Spread
Wheel Cacti *(Opuntia* spp.*)*	Destroy Infestations
Wild Artichoke *(Cynara cardunculus)*	Manage sites

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	Species that are not known to be present in the management area and which represent a significant threat if permitted to enter and establish. Aims to prevent the species arriving and establishing in the management area. • Prevention of entry to management area • Ongoing surveillance for incursions of the species • Training & awareness activities for the community to enable early detection
Eradicate	Aim to remove the weed species from the LMN district (and the N&Y NRM Region). • 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	Aim to significantly reduce the extent of the weed species in the LMN District (and the N&Y NRM region). • 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	Aim to prevent the ongoing spread of the weed species in the LMN District (and the N&Y NRM region). • 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	Aim to prevent spread of the weed species to key sites/assets of high economic, environmental and/or social value. • 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	Aim to reduce overall economic, environmental and/or social impacts of the weed species through targeted management. • 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	Aim to maintain overall economic, environmental and/or social value of key sites/assets through improved general weed management. • 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	Aim to detect any significant changes in the species' weed risk • Monitor the spread of the species and review any perceived changes in density and location.
Limited/ No Action	The weed species is perceived to be of insufficient risk to warrant any investment in regional strategic management actions.

Managing Priority Weeds

The Lower and Mid North District in line with N&Y Region Policy and management strategy will adopt improved management of declared weeds to manage populations at priority sites, identified in this plan, with the aim to maintain economic, environmental and/or social values of key sites/assets. Key sites in the Lower and Mid North District have been identified and listed in the Appendix B, which will be added to continuously as more are identified.

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:

NRM Act section	Title
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 Lower Mid North to stop the introduction and to slow the distribution of new weeds 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. The level of management for each species 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 to be included in the roadside inspection and control operations:

Weed	Hundreds
African Boxthorn	Redhill, Koolunga, Yackamoorundie, Everard, Blyth, Goyder, Stow, Hall Upper Wakefield, Stanley, Inkerman and Balaklava
African Rue	Red Hill, Koolunga, Yackamoorundie. Andrews and Ayres
Boneseed	Clare
Bridal Veil	Low occurrence, monitor all hundreds
Buffel Grass	Pirie, Napperby, Wandearah, Crystal Brook, Cameron, Inkerman, Balaklava, Dalkey, Alma and Gilbert
Coolatai Grass	Barunga and Alma
Creeping Knapweed	Wandearah, Narridy, Ayres, Upper Wakefield and Gilbert
Horehound	All Hundreds
Khaki Weed	All hundreds
Silverleaf Nightshade	All Hundreds
Wheel Cacti	Napperby, Eastern border hundreds
Wild Artichoke	Whyte, Reynolds, Anne, Andrews Ayers, Blyth, Clare Stanley, Upper Wakefield, Saddleworth, Alma and Gilbert

The process for implementing control of declared pants 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 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 Lower Mid North District and weed management activities mitigate these threats. The Lower Mid North District assets are:

- Agricultural Assets such as cropping, 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

Other Weeds

Weed species not included in this plan will be managed on a site by site basis, with the same objective as this plan, to protect the key assets outlined in appendix B.

Bathurst Burr (*Xanthium spinosum*
Blackberry *(Rubus fruticosus sp.)*
Bridal creeper (*Asparagus asparagoides)*
Calomba daisy *(Oncosiphon suffruticosum)*
Caltrop *(Tribulus terrestris)*
Cape Tulip *(Moraea flaccida and miniata)*
Cutleaf mignonette *(Reseda lutea)*
Gorse *(Ulex europaeus)*
Innocent weed *(Cenchrus longispinus and Cenchrus incertus)*
Lincoln weed *(Diplotaxis tenuifolia)*

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 Lower Mid North District, through its Mid North Horizons Community Action Planning (CAP) process, review progress and update management targets and actions accordingly.

Suggested time frame:

Year	Activity
2019	Draft plan reviewed by the LMN 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 can be implemented on a yearly and seasonal basis, with specific weeds to be targeted during the appropriate season.

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. LGA, 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
    - Autumn and winter; Boneseed, Bridal Veil, Coolatai Grass,
    - Spring and summer; African Rue, Buffel Grass, Creeping Knapweed, Horehound, Khaki Weed, SLNS, Wild artichoke
    - Year round; African Boxthorn, Wheel Cactus
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. LMN District Pest Plant Management – Annual Work Plan

African Boxthorn	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
African Rue	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Boneseed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth/Flowering												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Bridal Veil	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Buffel Grass	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Coolatai Grass	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												

Creeping Knapweed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Horehound	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Khaki Weed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Lincoln Weed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Silverleaf Nightshade	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth/Flowering												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Wheel Cacti	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												
Wild Artichoke	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active Growth												
Inspect												
Notify and/or Educate												
Optimal Treatment												

African Boxthorn *(Lycium ferocissimum)*

Common name(s)	African Boxthorn	
Plant description	African boxthorn is a branched shrub to 5m high and 3m wide, with spines on main stems and branchlets. 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).	
Risk Assessment Rating	Native Vegetation	Manage Weed
	Non-arable Grazing	Manage sites
	Urban	Protect Sites

Threats and Impacts

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	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 as its spines may cause physical injury. Thickets also provide harbour for pest animals.
Persistence	It is a declared plant with a historical legacy that persists in all environments. 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	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.
LMN District	Small populations are wide spread across the LMN district, often associated with low rainfall zones and marginal cropping areas. Higher densities are present in the coastal plains, the lower reaches of the Wakefield and Broughton Rivers and north-eastern areas of the district.
Potential distribution	African Boxthorn has the potential to re-infest properties that have been previously treated, easily infesting coastal areas, invading remnant native vegetation can increase in density where unmanaged.

Policy

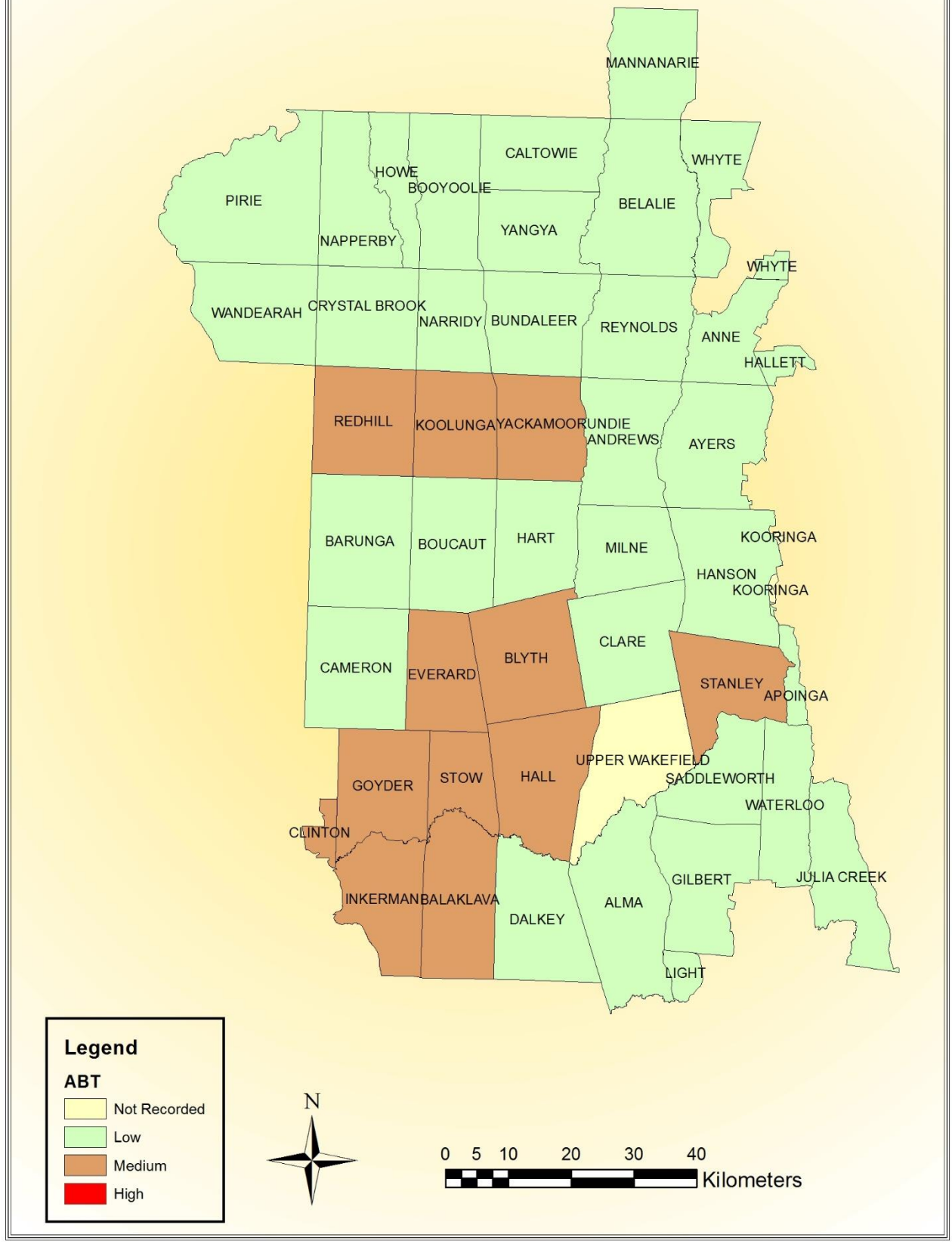
NRM Act	Northern and Yorke**:** 175(2), 177(1), 177(2), 182(2), 185.

Lower and Mid North District Action Plan

Objectives	• To control and contain African boxthorn infestations to protect key sites* in accordance with NRM board Regional Management Plans. • To prevent the spread of African boxthorn into uninfested areas. • To prevent the reinfestation of areas cleaned of African boxthorn.
Actions	• Continue to support the Eastern Plains Prickly WoNS active in the north-east corner of the district in collaboration with PIRSA Biosecurity, SFUN district and SAMDB region. • Map and record infestations in priority areas during weed inspections, identifying the responsible landowner(s). Priority areas are to be defined in a weed specific control plan, yet to be developed. • Use Declared Plant Property/Roadside Advice Letters, subsequently supporting landowners to control or contain infestations, using a softer approach to achieve voluntary compliance. • NRM staff or contractors to control roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Develop a plan for the systematic control of Boxthorns to protect key assets* in the landscape and to minimise further spread and limit reinfestation's. The project will initially concentrate on controlling outlies and smaller infestations and containing larger populations. Priority 'key sites' to be determined though the CAP process and through strategic and risk evaluation. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Update the factsheet to include a guide to identifying and distinguishing African Boxthorn. • Promote the Weeds of National Significance – African Boxthorn Best Practice Manual.

	*denotes reference to Appendix B – Key Assets

Lower Mid-North
African boxthorn Densities 2019



African Rue *(Peganum harmala)*

Common name(s):	African rue, Esfand, Wile rue, Syrian rue, Harmel, Aspand	
Plant description:	Perennial herb or shrubby plant 30-80 cm high. Leaves 1-5 cm long, bright green, divided several times into three or more linear segments. Flowers, with 5 white broad petals (12- 17 mm long). Fruit is slightly flattened capsule (8-12 mm across, 7-12 mm long) which opens at the top, containing black angular seeds.	
Risk Assessment Rating:	Non-arable grazing	Protect Sites

Threats and Impacts

Invasiveness	Dispersal of the plant is predominately through seed, with the majority of seed being dropped close to the parent plant. Seeds can easily be dispersed by water, animal and vehicle movement and through animal ingestion. African rue prefers disturbed sites with little or no competition, and requires moisture for seed germination, primarily occurring along roadsides and flood areas. African rue is drought and salt tolerant, having a potential large impact in semi-arid and arid areas.
Impacts	African Rue can be toxic containing more than 25 alkaloids, however the plant is highly unpalatable to livestock (few poisonings have been reported). The likely impact on native vegetation is unknown, but due to its tolerance to drought and salt the potential impacts could be large.
Persistence	African rue is difficult to destroy once established due to the vegative regeneration of severed root pieces. African rue is known to persist despite treatment with herbicide or manual removal.

Current Distribution

State	Isolated Infestations are present in the eastern third of the state, as far north as Leigh Creek. Significant densities occur in the Southern Flinders/Upper North district and in the south-eastern part of the SAAL region.
LMN District	The largest population of African Rue in the LMN district is on the Broughton River between Spalding and Redhill. There is a high risk of incursion across the northern boundary of the LMN district in areas of vehicle and water movement.
Potential distribution	African rue has the potential to become widespread throughout the arid lands region in disturbed areas such as roadsides and areas receiving run-on water such as flood outs and depressions. The zone of potential distribution has been described as between the 350 mm and 175 mm isohyets.

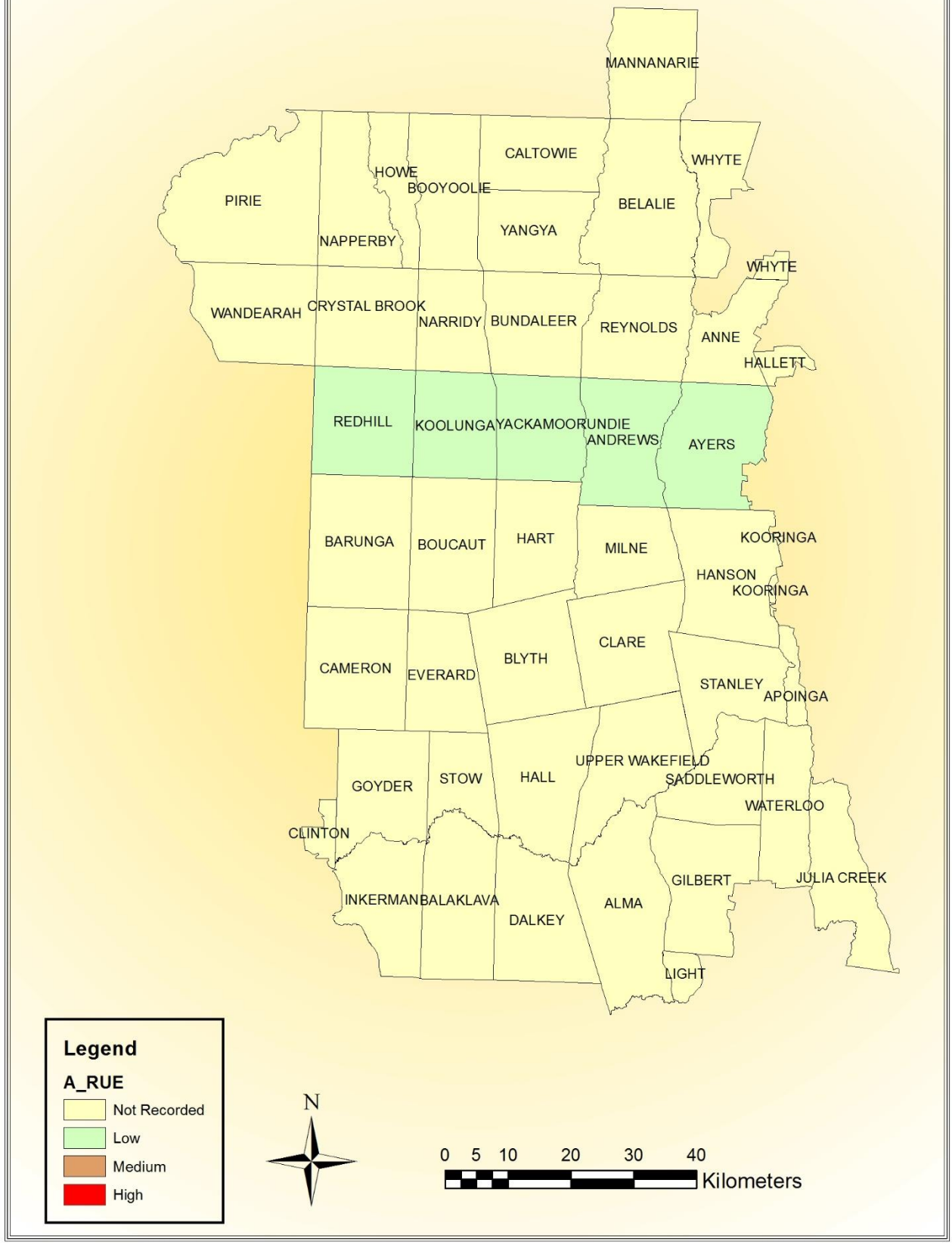
Policy

NRM Act:	Northern and Yorke**:** 175(2), 177(1), 177(2), 182(2), 185.

Lower and Mid North District Action Plan

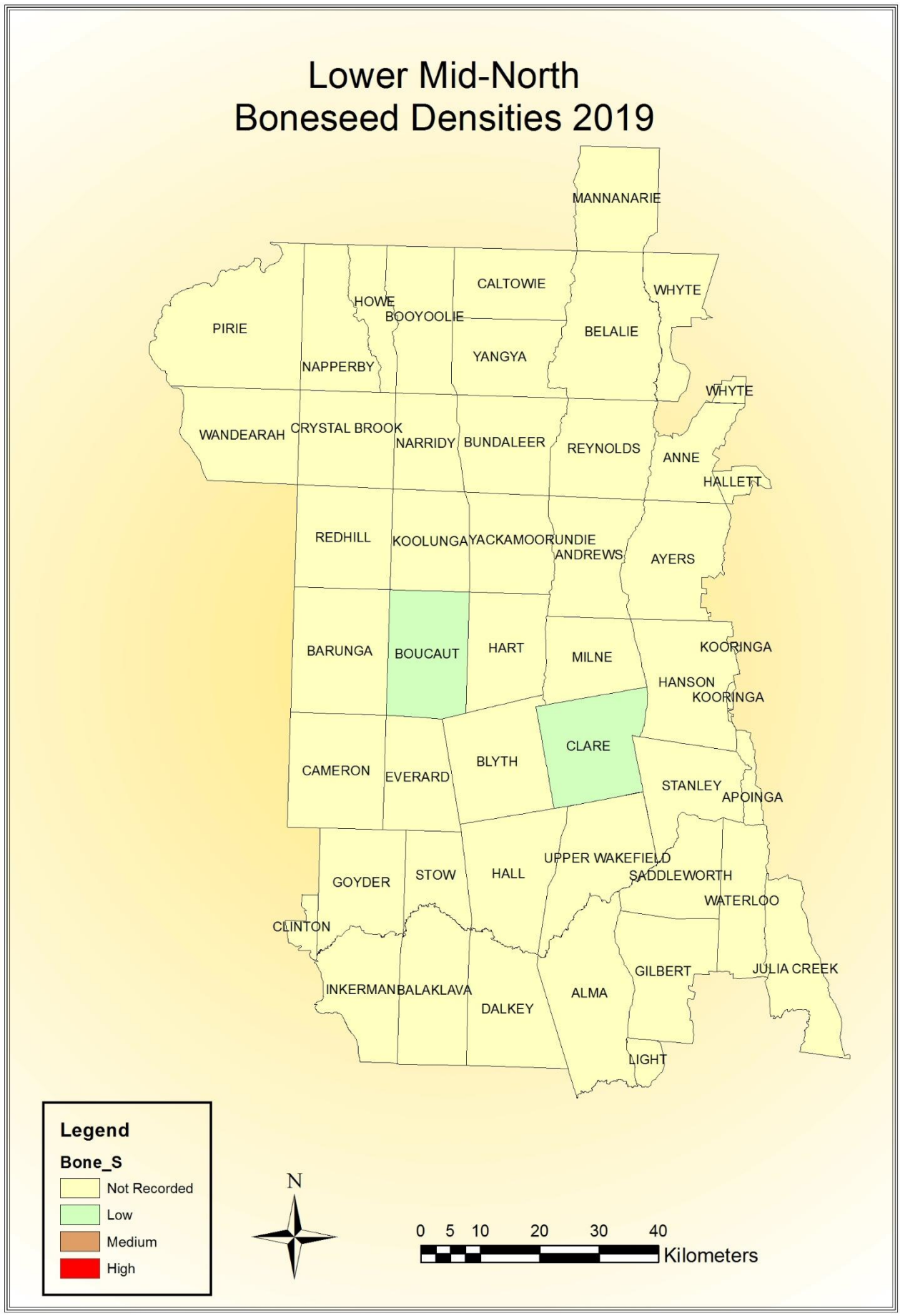
Objectives	• Prevent the spread of African rue into uninfested areas. • Prevent small African rue infestations from affecting present and future land management options.
Actions	• Map and record infestations in priority areas during spring/summer weed inspections, identifying the responsible landowner(s). The current priority areas are along the Broughton River between Redhill and Spalding and the LMN district's north-eastern boundary focusing on the Barrier Hwy. • Use Declared Plant Property/Roadside Advice Letters, subsequently supporting landowners to control or contain infestations, using a softer approach to achieve voluntary compliance. • NRM staff or contractors to control roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Develop a plan for the Broughton River population between Redhill and Spalding, containing it to the river and halting its spread through adjoining properties and roadsides. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Develop a factsheet to accompany any correspondence with stakeholders, in addition to the existing 'Join the crew against African Rue' fridge magnets and flyers. • Engage relevant industries through workshops and correspondence.

Lower Mid-North African rue Densities 2019



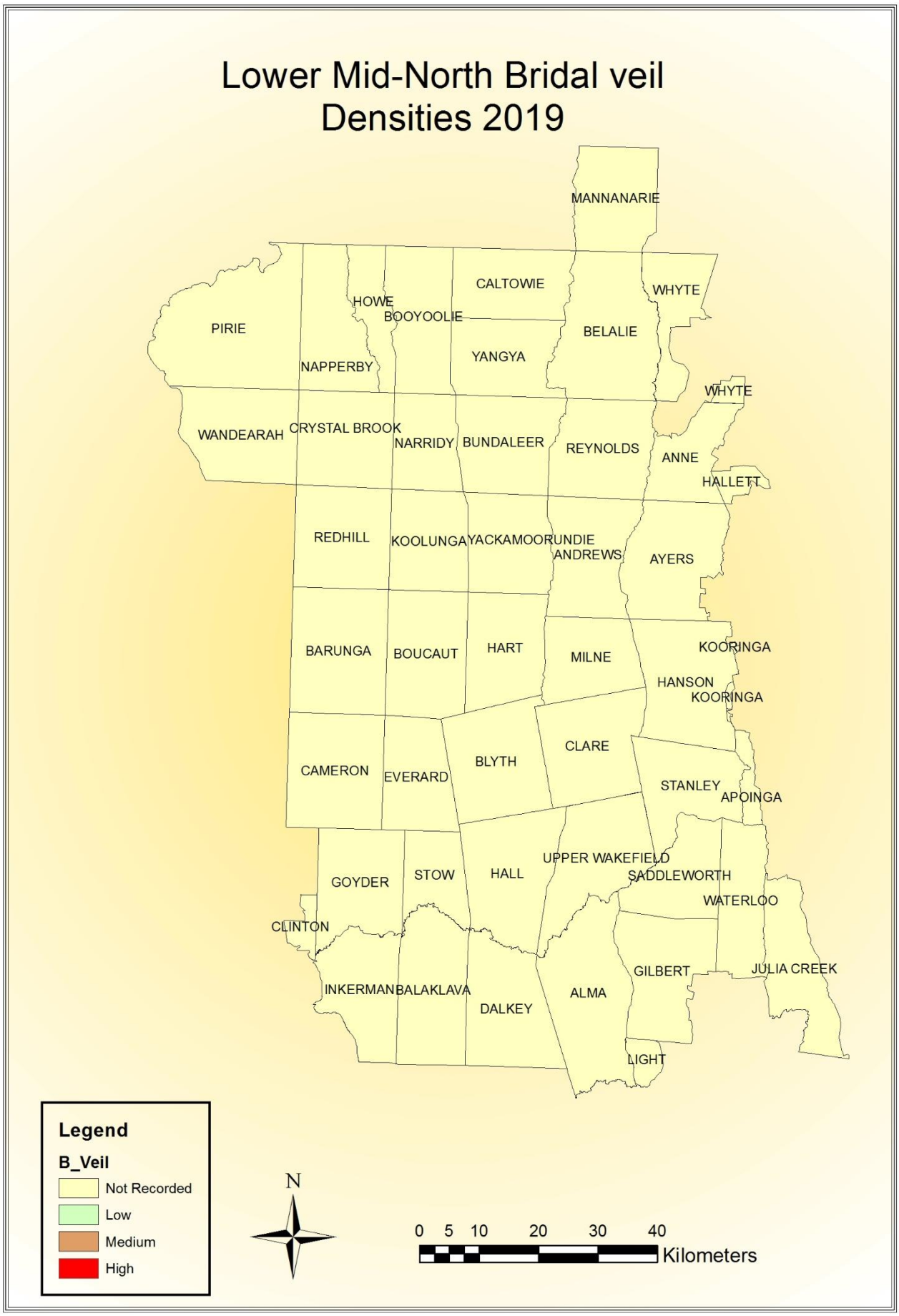
Boneseed *(Chrysanthemoides monilifera ssp. monilifera)*

Common name(s):	Boneseed	
Plant description:	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	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.	
LMN District	Boneseed infestations have been located within the vicinity of Sevenhill and Policeman's Paddock, west of Clare.	
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		
NRM Act:	Northern and Yorke**:** 175(1), 175(2), 177(1), 177(2), 182(2), 185	
Lower and Mid North District Action Plan		
Objectives	• Spread of boneseed to uninfested areas prevented. • Infestations located and eradicated according to NRM board regional management plans. • Priority infestations of boneseed contained and their impacts reduced.	
Actions	• Map and record infestations in priority areas during winter weed inspections, identifying the responsible landowner(s). The current priority areas are wooded native vegetation sites between Stanley Flat and Watervale, including the known populations. Known sites should be revisited annually. • Use Declared Plant Property/Roadside Advice Letters for voluntary compliance. If this is not achieved we may follow up with formal compliance, where the landowner will be required to develop an action plan. Noncompliance with the action plan will be followed up with NRM or contractor control with cost recovery. • NRM staff or contractors to control roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Continue to support and extend the joint Northern and Yorke and Eyre Peninsula 10 year management plan and its objectives. • Develop a factsheet to accompany any correspondence with stakeholders.	


Lower Mid-North
Boneseed Densities 2019
MANNANARIE
CALTOWIE
WHYTE
HOWE
BOOYOOLIE
PIRIE
BELALIE
YANGYA
NAPPERBY
WHYTE
WANDEARAH
CRYSTAL BROOK
NARRIDY
BUNDALEER
REYNOLDS
ANNE
HALLETT
REDHILL
KOOLUNGA
YACKAMOORUNDIE
ANDREWS
AYERS
BARUNGA
BOUCAUT
HART
MILNE
KOORINGA
HANSON
KOORINGA
CLARE
CAMERON
EVERARD
BLYTH
STANLEY
APOINGA
UPPER WAKEFIELD
GOYDER
STOW
HALL
SADDLEWORTH
WATERLOO
CLINTON
GILBERT
JULIA CREEK
INKERMAN
BALAKLAVA
ALMA
DALKEY
LIGHT
Legend
Bone_S
Not Recorded
Low
Medium
High
N
0 5 10 20 30 40
Kilometers

Bridal Veil *(Asparagus declinatus)*

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, as a distance of 10 km. 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	Bridal veil is scattered throughout the Eyre Peninsula, Kangaroo Island, Northern & Yorke, AMLR regions.	
LMN District	Bridal Veil is an emerging weed in the LMN district, no known populations occur. Possible invasion through the south-east and western boundaries. Northern (known around Wirrabara).	
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		
NRM Act:	Northern and Yorke**:** 175(2), 177(1), 177(2), 182(2), 185	
Lower and Mid North District Action Plan		
Objectives	• Contain existing infestations to prevent spread into uninvaded areas. • Eradicate bridal veil from sites of high conservation significance. • Destroy priority infestations in accordance with NRM board regional management plans.	
Actions	• Map and record infestations in priority areas during winter weed inspections, identifying the responsible landowner(s). The current priority areas are adjacent to known populations in the York Peninsula and Northern Hills and Plains districts. Known sites should be revisited annually. • Use Declared Plant Property/Roadside Advice Letters, subsequently supporting landowners to control or contain infestations, ensuring that the control of all infestations are achieved. • NRM staff or contractors to control roadside infestations as a **high priority**. Controlled with the use of levy/ project funding or the above process and recovering costs from the adjoining landowner. • Awareness and education through at least one media release per year focusing on the identification and reporting of infestations to us, as per the LMN Media Plan • Develop a factsheet to accompany any correspondence with stakeholders	


Lower Mid-North Bridal veil
Densities 2019
MANNANARIE
CALTOWIE
WHYTE
HOWE
BOOYOOLIE
PIRIE
BELALIE
YANGYA
NAPPERBY
WHYTE
WANDEARAH
CRYSTAL BROOK
NARRIDY
BUNDALEER
REYNOLDS
ANNE
HALLETT
REDHILL
KOOLUNGA
YACKAMOORUNDIE
ANDREWS
AYERS
BARUNGA
BOUCAUT
HART
MILNE
KOORINGA
HANSON
KOORINGA
CLARE
CAMERON
EVERARD
BLYTH
STANLEY
APOINGA
UPPER WAKEFIELD
GOYDER
STOW
HALL
SADDLEWORTH
WATERLOO
CLINTON
GILBERT
JULIA CREEK
INKERMAN
BALAKLAVA
ALMA
DALKEY
LIGHT
Legend
B_Veil
Not Recorded
Low
Medium
High
N
0 5 10 20 30 40
Kilometers

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	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.
LMN District	Monitor/ control buffer eastern side (railway line) of Augusta Highway. Monitor/ control southern extent, currently E/W line at Warnertown. Eradicate/control and monitor all known outlier populations in district, currently east of Crystal Brook (Huddleston Rd).
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".

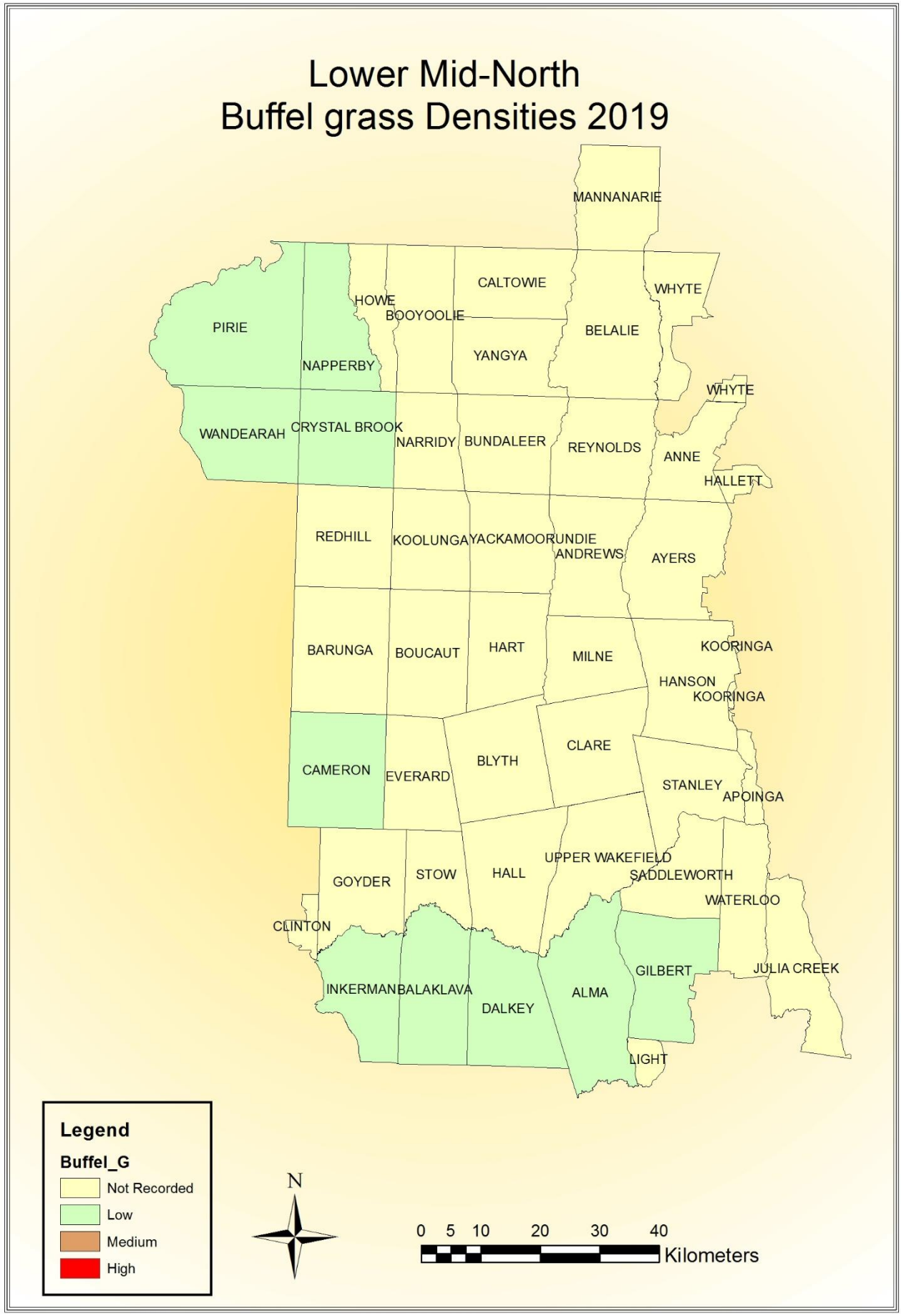
Policy

NRM Act:	Northern and Yorke**:** 175(1), 175(2), 177(1), 177(2), 182(2), 185

Lower and Mid North District Action Plan

Objectives	• Vulnerable sites currently uninfested with Buffel Grass protected from invasion. • Buffel grass contained within its present range in South Australia, and this range incrementally reduced where possible. • Buffel grass infestations are removed from key dispersal nodes and pathways. • Natural and built assets protected from the fire risk associated with Buffel Grass infestations
Actions	• Map and record infestations in priority areas during spring/summer weed inspections, identifying the responsible landowner(s). The current priority areas are the boundaries of the Augusta Hwy population and its southern zone between Warnertown and Weeroona Island. Additionally, the

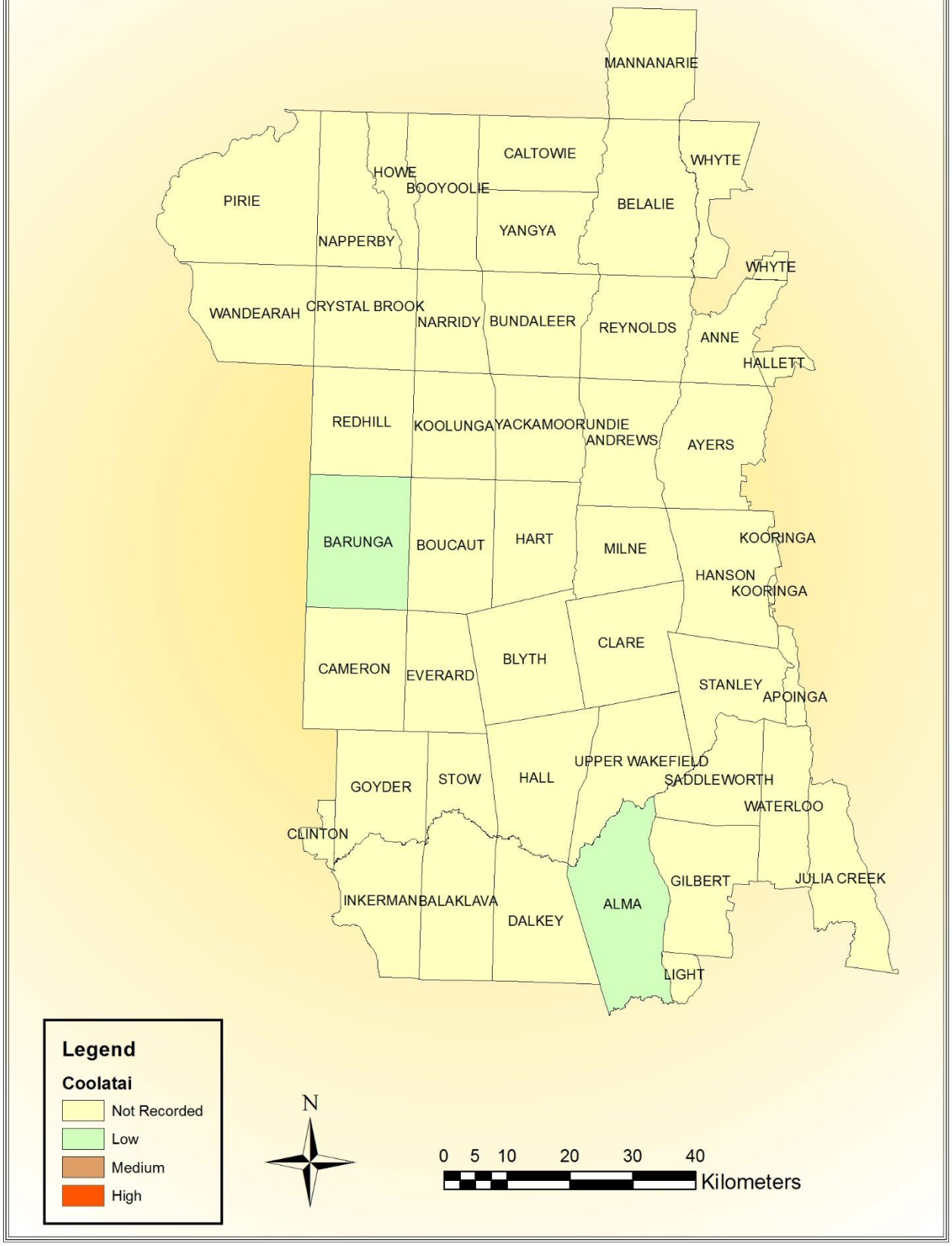
	transport routes radiating from this population will be included in inspections. • Use Declared Plant Property/Roadside Advice Letters for voluntary compliance. If this is not achieved we may follow up with formal compliance, where the landowner will be required to develop an action plan. Noncompliance with the action plan will be followed up with NRM or contractor control with cost recovery. This will be the approach on populations south of Warnertown and outliers from the main population. • NRM staff or contractors to control roadside infestations through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Continue contribution the South Australian Buffel Grass Strategic Plan and State Buffel Grass Taskforce operations coordinated by the Invasive Species Unit, PIRSA Biosecurity. • Develop a plan to suppress the southern areas of the main population, shifting the current southern edge of the main population from Warnertown to Port Germein including Weeroona Island. This will contribute to the next stages of the South Australian Buffel Grass Strategic Plan and State Buffel Grass Taskforce. • Engage relevant industries through workshops and correspondence. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Notify PIRSA Biosecurity of populations, control and plans of outlier populations


Lower Mid-North
Buffel grass Densities 2019
MANNANARIE
CALTOWIE
WHYTE
HOWE
BOOYOOLIE
PIRIE
BELALIE
YANGYA
NAPPERBY
WHYTE
WANDEARAH
CRYSTAL BROOK
NARRIDY
BUNDALEER
REYNOLDS
ANNE
HALLETT
REDHILL
KOOLUNGA
YACKAMOOR
RUNDIE
ANDREWS
AYERS
BARUNGA
BOUCAUT
HART
MILNE
KOORINGA
HANSON
KOORINGA
CAMERON
EVERARD
BLYTH
CLARE
STANLEY
APOINGA
UPPER WAKEFIELD
GOYDER
STOW
HALL
SADDLEWORTH
WATERLOO
CLINTON
GILBERT
JULIA CREEK
INKERMAN
BALAKLAVA
DALKEY
ALMA
LIGHT
Legend
Buffel_G
Not Recorded
Low
Medium
High
N
0 5 10 20 30 40
Kilometers

Coolatai Grass *(Hyparrhenia hirta)*

Common name(s):		
Plant description:	Coolatai grass is a summer-growing perennial grass that degrades pasture by forming large unpalatable tussocks.	
Weed Risk Assessment Rating:	Native Vegetation	Alert
	Urban	Alert
Threats and Impacts		
Invasiveness	Coolatai grass has high seed production, spreading seed readily, germinating on road reserves after being carried long distances on vehicles. It may also move directly between paddocks in fodder or on vehicles and livestock. Soil movement, slashing and water flow have been found to be the main agents of dispersal along roadsides in other States. Seed can germinate readily over a wide range of temperatures, light regimes and soil pH levels and under marginal water stress	
Impacts	Coolatai grass has a similar niche to kangaroo grass tending to become dominant in open habitats such as woodlands and grasslands with 400–700 mm annual rainfall. It develops as large tussocks in which the new growth is surrounded by tough, Coolatai Grass policy 3 of 4 unpalatable older leaves, reducing the cover of useful forage in pasture paddocks, forms a dense cover that excludes native regeneration or growth of more palatable grasses, and carries a heavy load of inflammable older leaf material.	
Persistence	Coolatai grass forms tough long-lived perennial tussocks that resist grazing and re-sprout after burning. There is likely to be a seed bank formed with seedlings appearing for at least a few years after tussocks are sprayed out.	
Current Distribution		
State	Established in the Adelaide area where invasive on former grazing land in the northern suburbs, and spot infestations have been found on roadsides with in NY, SAMDB, AMLR and the SE regions.	
LMN District	Small populations are present on the Augusta Highway south of Snowtown and on the Hamley Bridge to Stockport rail corridor.	
Potential distribution	Coolatai grass could grow in most of the perennial grazing lands in the southern part of state, and in higher rainfall parts of the rangelands. It does not tolerate waterlogging and would be excluded from poorly drained habitats.	
Policy		
NRM Act:	Northern and Yorke**:** 175(2), 177(1), 177(2), 180, 182(2), 185	
Lower and Mid North District Action Plan		
Objectives	• Contain and destroy priority infestations in the infested regions. • Prevent establishment of further incursions in other regions.	
Actions	• Map and record infestations in priority areas during winter weed inspections, identifying the responsible landowner(s). The current priority areas are the Hamley Bridge to Stockport rail corridor and along the Augusta Hwy south of Snowtown. Known sites should be revisited annually. • Use Declared Plant Property/Roadside Advice Letters for voluntary compliance. If this is not achieved we may follow up with formal compliance, where the landowner will be required to develop an action plan. Noncompliance with the action plan will be followed up with NRM or contractor control with cost recovery. • NRM staff or contractors to control roadside infestations through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Engage relevant industries through workshops and correspondence. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Notify PIRSA Biosecurity of populations, control and plans. • Develop a factsheet to accompany any correspondence with stakeholders.	

Lower Mid-North Coolatai grass Densities 2019



Creeping Knapweed *(Rhaponticum repens)*

Common name(s):	Hardhead thistle, hardheads and Russian knapweed	
Plant description:	An 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. 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.	
Weed Risk Assessment Rating:	Crop-Pasture Rotation	Destroy Infestations

Threats and Impacts

Invasiveness	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.
Impacts	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.
Persistence	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.

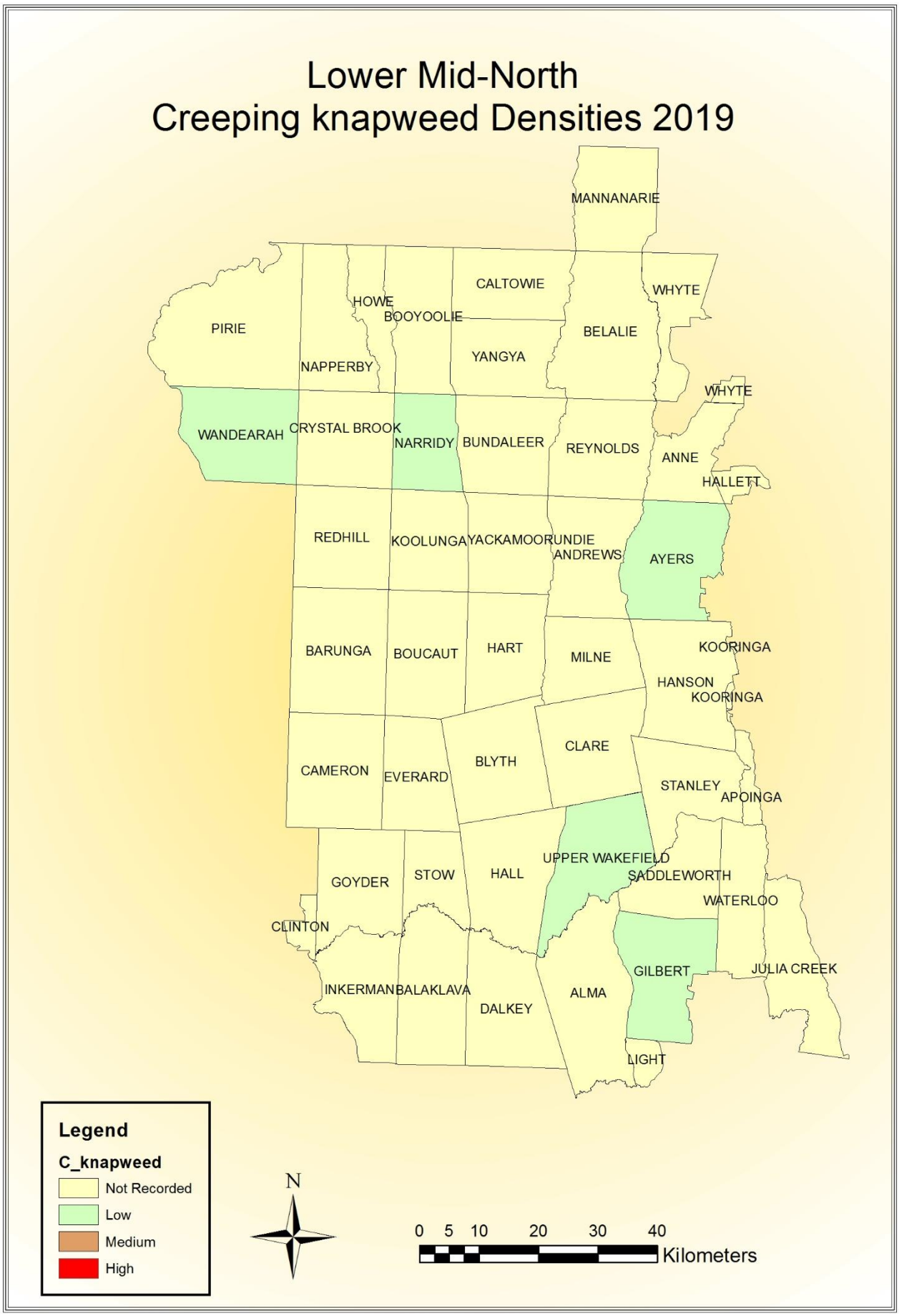
Current Distribution

State	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.
LMN	Wandearah is the area of most concern in the LMN, with lesser populations in the hundreds of Narridy, Ayers, Upper Wakefield and Gilbert.
Potential distribution	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 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

NRM Act:	Northern and Yorke**:** 175(2), 177(1), 177(2), 180, 182(2), 185

Lower and Mid North District Action Plan	
Objectives	• Destroy high priority creeping knapweed infestations. • Contain larger infestations. • Increase landholder recognition of creeping knapweed. • Prevent the movement of contaminated seed, hay or grain from infested areas.
Actions	• Map and record infestations in priority areas during spring/summer weed inspections, identifying the responsible landowner(s). The current priority areas are the hundreds of, Narridy, Ayers, Upper Wakefield and Gilbert, with a longer term control plan for the Wandearah population to be developed. Known sites should be revisited annually. • Use Declared Plant Property/Roadside Advice Letters for voluntary compliance. If this is not achieved we may follow up with formal compliance, where the landowner will be required to develop an action plan. Noncompliance with the action plan will be followed up with NRM or contractor control with cost recovery. • NRM staff or contractors to control roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Develop a factsheet to accompany any correspondence with stakeholders. • Notify PIRSA Biosecurity of populations, control and plans.


Lower Mid-North
Creeping knapweed Densities 2019
MANNANARIE
CALTOWIE
WHYTE
HOWE
BOOYOOLIE
PIRIE
BELALIE
YANGYA
NAPPERBY
WHYTE
WANDEARAH
CRYSTAL BROOK
NARRIDY
BUNDALEER
REYNOLDS
ANNE
HALLETT
REDHILL
KOOLUNGA
YACKAMOORUNDIE
ANDREWS
AYERS
BARUNGA
BOUCAUT
HART
MILNE
KOORINGA
HANSON
KOORINGA
CLARE
CAMERON
EVERARD
BLYTH
STANLEY
APOINGA
UPPER WAKEFIELD
GOYDER
STOW
HALL
SADDLEWORTH
WATERLOO
CLINTON
GILBERT
JULIA CREEK
INKERMAN
BALAKLAVA
ALMA
DALKEY
LIGHT
Legend
C_knapweed
Not Recorded
Low
Medium
High
N
0 5 10 20 30 40
Kilometers

Horehound *(Marrubium vulgare)*

Common name(s):	Common horehound, hoarhound, houndsbane, malrove, marrubio, ou xia zhi cao and white horehound.	
Plant description:	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. Horehound is an opportunistic germinator, with most seeds germinating in response to autumn rainfall. Horehound will grow on very poor soils and is often a pioneer species colonising eroded areas.
Impacts	Horehound in 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. Seedling regeneration also occurs after herbicide treatment. Fire will kill all mature plants and reduce the seed bank by up to 80%.

Current Distribution

State	Horehound has spread to its limits in SA, being widespread in all settled and pastoral areas with at least 200 mm annual rainfall.
LMN	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.

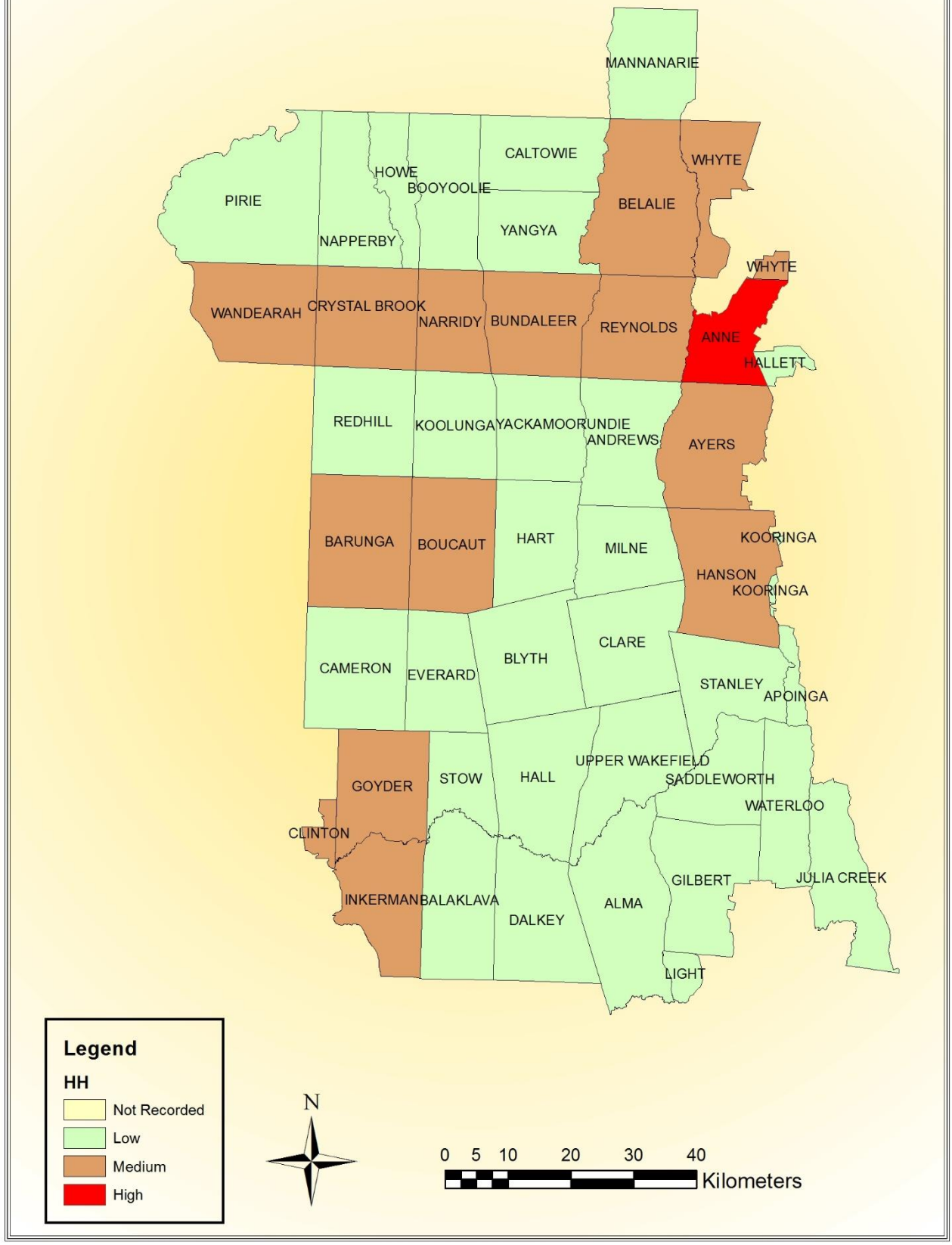
Policy

NRM Act:	Northern and Yorke**:** 175(2), 177(1), 177(2), 182(2), 185

Lower and Mid North District Action Plan

Objectives	• Minimise further spread of horehound into any areas suitable for its establishment where it is not yet present.
Actions	• Map and record infestations in priority areas during winter/spring weed inspections, identifying the responsible landowner(s). Priority infestations are new populations and outliers in the district and where key assets*are threatened. • Use Declared Plant Property/Roadside Advice Letters for voluntary compliance, reinspecting and following up the next year. • NRM staff or contractors to control roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Awareness and education through at least one media release per year, as per the LMN Media Plan. *denotes reference to Appendix B – Key Assets

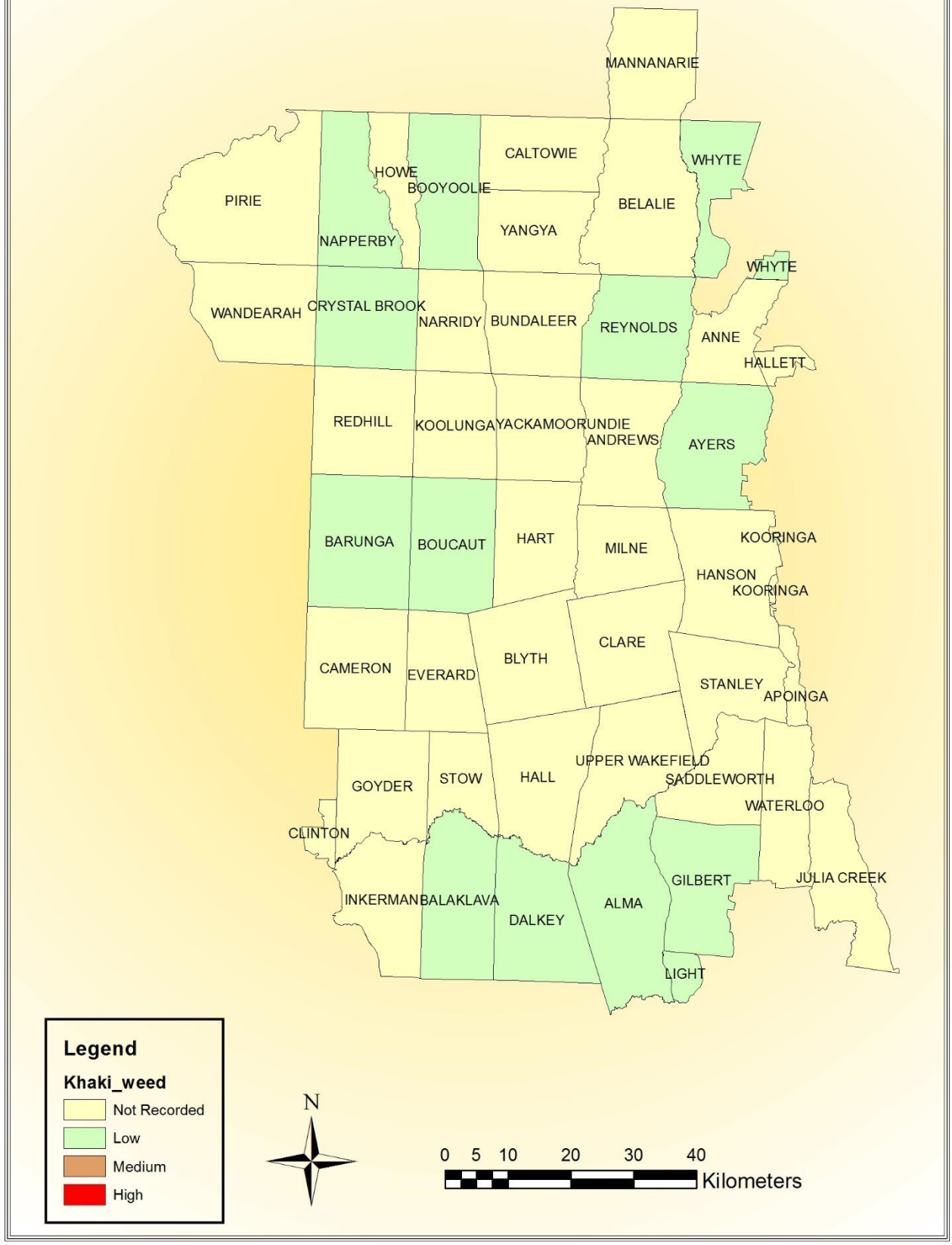
Lower Mid-North Horehound Densities 2019



Khaki Weed *(Alternanthera pungens)*

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	Increasing number of infestation in the Lower Mid-North and Southern Flinders Upper North Districts associated with vehicle and people movements.	
LMN	Limited knowledge of distribution. Wide spread, small populations throughout the LMN, with key populations along the Barrier Hwy near Jamestown.	
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		
NRM Act:	Northern and Yorke**:** 175(1), 175(2), 177(1), 177(2), 180, 182(1), 185	
Lower and Mid North District Action Plan		
Objectives	• Detect and destroy all khaki weed infestations. • Prevent further spread and establishment in SA.	
Actions	• Map and record infestations in priority areas during spring/summer weed inspections, identifying the responsible landowner(s). The current priority areas include camping grounds, ovals, and roadhouses, walking trails and other high risk areas in the district. Known sites should be revisited annually. • Use Declared Plant Property/Roadside Advice Letters for voluntary compliance. If this is not achieved we may follow up with formal compliance, where the landowner will be required to develop an action plan. Noncompliance with the action plan will be followed up with NRM or contractor control with cost recovery. • NRM staff or contractors to control roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Education of council and DPTI employees on recognising, reporting and controlling Khaki Weed. • Special media release with a survey type campaign to increase our knowledge of its distribution ready for contract or NRM LMN control. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Engage relevant industries through workshops and correspondence, i.e. tourism. • Notify PIRSA Biosecurity of populations, control and plans.	

Lower Mid-North Khaki weed Densities 2019



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.

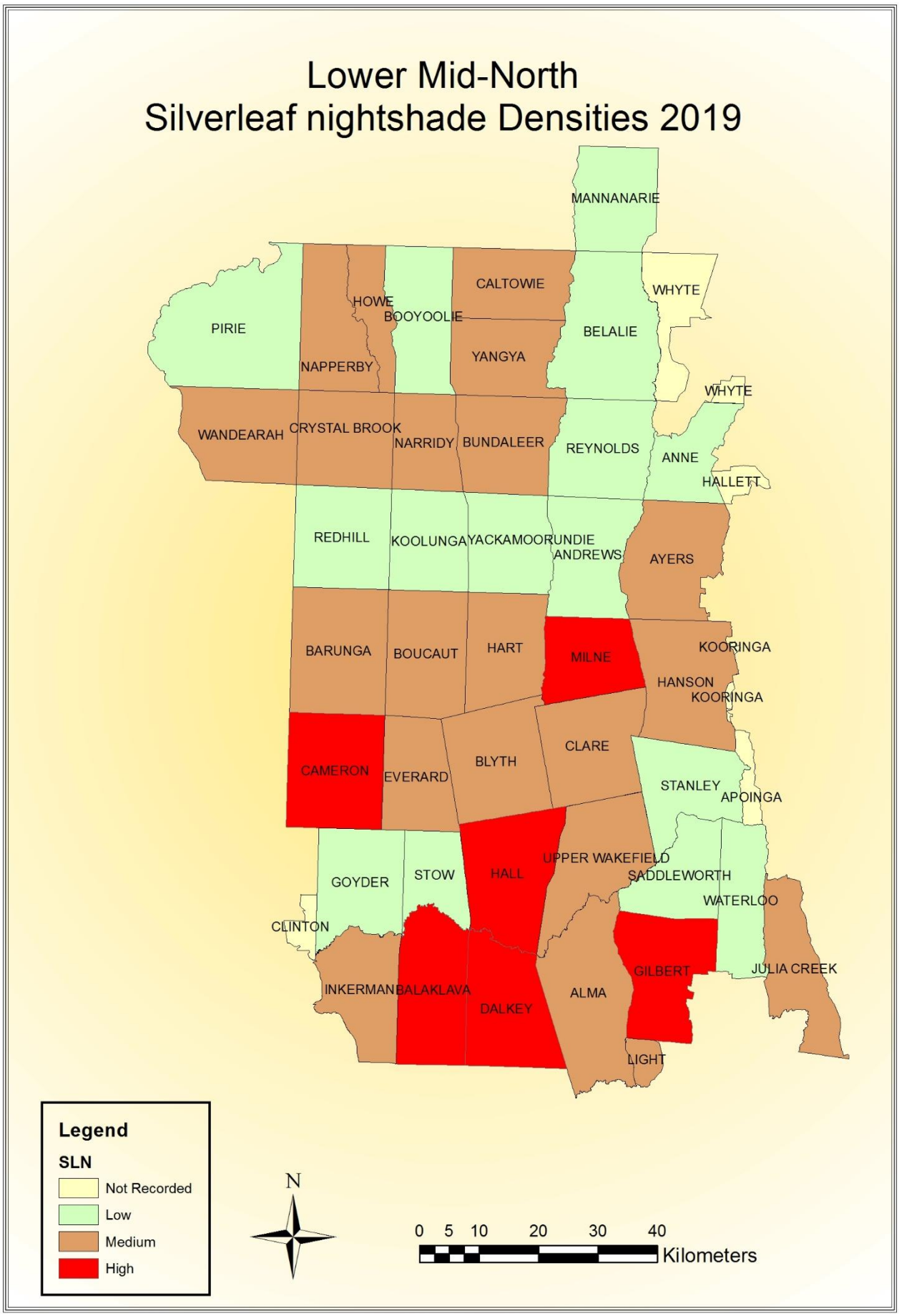
Current Distribution

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).
LMN District	Wide spread in the LMN 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

NRM Act:	Northern and Yorke**:** 175(2), 177(1), 177(2), 182(2), 185

Lower and Mid North District Action Plan	
Objectives	• Existing infestations of Silverleaf Nightshade contained to their present size and progressively reduced. • Spread of Silverleaf Nightshade to uninfested properties prevented.
Actions	• Map and record infestations during spring/summer weed inspections, identifying the responsible landowner(s). The current priority areas are outliers and new populations in the district and where key assets (appendix B) are frightened. • Use Declared Plant Property/Roadside Advice Letters, subsequently supporting landowners to control or contain infestations, using a softer approach to achieve voluntary compliance. • NRM staff or contractors to control priority roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Education of council and DPTI employees on recognising, reporting and controlling Silver Leaf Nightshade. • Awareness and education through at least one media release per year, as per the LMN Media Plan. Relevant industries will also be engaged though workshops and correspondence. • Develop an guide identifying and distinguishing Silverleaf Nightshade from the similar, less invasive native species • Promote the Australian Best Practice management Manual 2018 – Silverleaf Nightshade.


Lower Mid-North
Silverleaf nightshade Densities 2019
MANNANARIE
CALTOWIE
WHYTE
HOWE
BOOYOOLIE
PIRIE
BELALIE
YANGYA
NAPPERBY
WHYTE
WANDEARAH
CRYSTAL BROOK
NARRIDY
BUNDALEER
REYNOLDS
ANNE
HALLETT
REDHILL
KOOLUNGA
YACKAMOOR
UNDIE
ANDREWS
AYERS
BARUNGA
BOUCAUT
HART
MILNE
KOORINGA
HANSON
KOORINGA
CAMERON
EVERARD
BLYTH
CLARE
STANLEY
APOINGA
GOYDER
STOW
HALL
UPPER WAKEFIELD
SADDLEWORTH
WATERLOO
CLINTON
GILBERT
JULIA CREEK
INKERMAN
BALAKLAVA
DALKEY
ALMA
LIGHT
Legend
SLN
Not Recorded
Low
Medium
High
N
0 5 10 20 30 40
Kilometers

Wheel Cactus *(Opuntia spp.)*

Common name(s):	Including but not limited to; Common Prickly Pear (*Opuntia stricta*), Wheel Cactus (*Opuntia robusta*), Engelmann's Prickly Pear (*Opuntia engelmanni*) including	
Plant description:	The Opuntia Cacti (*Opuntia* spp.) which include the Wheel Cactus and Prickly Pear are Weeds of National Significance (WoNS) and declared plants under the Natural Resources Management Act 2004. The Sweet Prickly Pear (Opuntia ficus-indica is excluded from this declaration). Opuntia Cacti are a succulent, typically long-lived, perennial shrubs, generally growing up to 2m high. These Cacti have round or oval shaped flattened stem segments, referred to as pads. A key distinguishing feature are fine hair-like detachable barb bristles. The Sweet Prickly Pear does not have these barbs. Flowering typically occurs from spring through to summer, with fruits forming in late summer and into autumn. Flowers are large and can be coloured white, orange, yellow, pink, red and purple. Most produce fleshy fruit which ripen to red, purple or yellow. Not all species develop mature fruit, but those that do produce numerous seeds. Seed can germinate year round during adequate rainfall.	
Weed Risk Assessment Rating:	Non-arable Grazing	Destroy Infestations
	Native Vegetation	Destroy Infestations

Threats and Impacts

Invasiveness	Cacti originally invaded the landscape as escaped ornamental plants and through the dye and cacti fruit industry. Wheel Cactus and Prickly Pear are spread from the movement of seeds, fruits and segments. Segments may be spread via clothing, footwear, animals as well as gravity in rough terrain. Wheel Cactus and Prickly Pear fruit is attractive to some birds, and some mammals including foxes, aiding seed dispersal.
Impacts	Opuntia Cacti form dense infestations, displacing desirable vegetation, limiting access for stock, vehicles and humans. Their spines can injure livestock, detaching from the plant when rubbed or eaten into flesh or eyes. Large patches also harbour pest animals, such as rabbits who gain safe refuge under the spiny plant.
Persistence	Due to their duel methods of reproduction and their hardy, drought tolerant nature, once cacti entre a landscape they spread easily. Cacti thrive in hot, dry conditions often associated with outback terrain making infestations difficult to discover and challenging to control thereafter. They are effectively excluded from native vegetation in higher rainfall regions by competition from other plants. They are effectively excluded from native vegetation in higher rainfall regions by competition from other plants

Current Distribution

State and N&Y NRM region	The major infestations of wheel cactus occur in the Flinders Ranges and the adjoining North East Pastoral districts, and on permanent grazing lands near Peterborough and in the Mid Murray area. Infestations of common prickly pear are in the Flinders Ranges and Riverland regions. Other spot infestations occur in the Adelaide area, along the highway from Adelaide to Port Augusta, Murray Bridge, Goolwa and Reevesby Island.
LMN District	Currently wide spread but sparse, with most populations associated with gardens and waste pits. High populations exist over the districts borders to the north, north east and east, increasing pressure and incursion on LMN boundary land.
Potential distribution	It is estimated that 18% of the AW NRM region and 11% of the SAAL NRM region are suitable for the establishment of this species, with smaller areas on the northern edges of the Eyre Peninsula, SA Murray Darling Basin and the Northern and Yorke NRM regions.

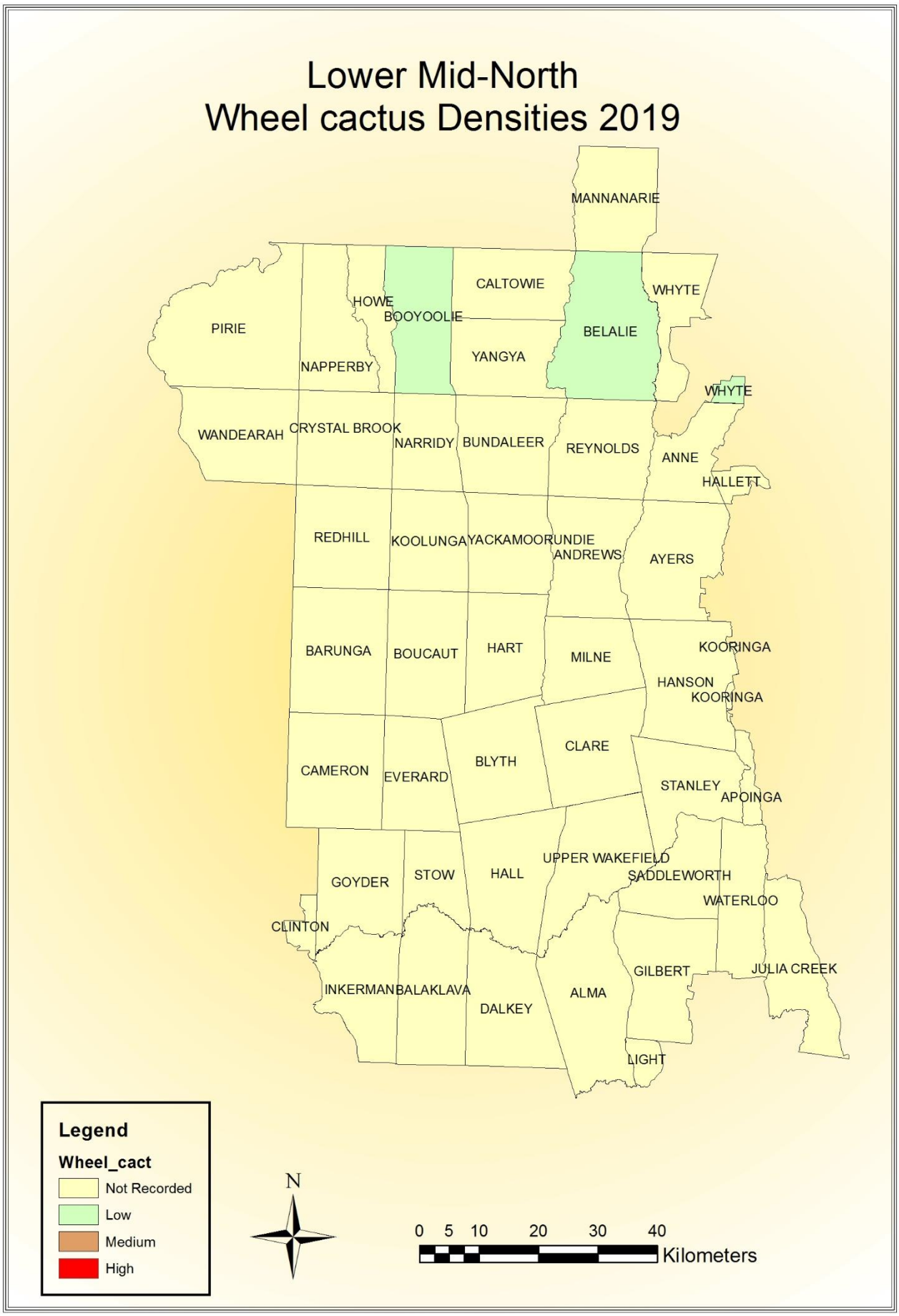
Policy

NRM Act:	Northern and Yorke**:** 175(1), 175(2), 177(1), 177(2), 182(2), 185

Lower and Mid North District Action Plan

Objectives	• Existing infestations of prickly pears contained and reduced. • Spread of prickly pears to uninfested areas of the pastoral regions prevented. • Introduction of additional prickly pear species to the pastoral regions of the State prevented.
Actions	• Map and record infestations in priority areas during weed inspections, identifying the responsible landowner(s). The current priority areas are the districts northern and eastern boundaries, where incursion from other districts is occurring on roadsides and in creek lines.

	• Monitor high risk areas for infiltration into LMN district, focusing on the northern and eastern boarders. • Monitor and identify high priority infestations on private/public lands through combined weed surveys. • Use Declared Plant Property/Roadside Advice Letters, subsequently supporting landowners to control or contain infestations, using a softer approach to achieve voluntary compliance. • NRM staff or contractors to control priority roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Continue to support the Eastern Plains Prickly WoNS active in the north-east corner of the district in collaboration with the Invasive Species Unit, PIRSA Biosecurity and the SFUN district and SAMDB region. • A region weed management plan to be developed. • Awareness and education through at least one media release per year, as per the LMN Media Plan. • Promote the Weeds of National Significance - Managing Opuntioid Cacti In Australia, Best Practice Control Manual.


Lower Mid-North
Wheel cactus Densities 2019
MANNANARIE
CALTOWIE
WHYTE
HOWE
BOOYOOLIE
PIRIE
BELALIE
YANGYA
NAPPERBY
WHYTE
WANDEARAH
CRYSTAL BROOK
NARRIDY
BUNDALEER
REYNOLDS
ANNE
HALLETT
REDHILL
KOOLUNGA
YACKAMOORUNDIE
ANDREWS
AYERS
BARUNGA
BOUCAUT
HART
MILNE
KOORINGA
HANSON
KOORINGA
CAMERON
EVERARD
BLYTH
CLARE
STANLEY
APOINGA
GOYDER
STOW
HALL
UPPER WAKEFIELD
SADDLEWORTH
WATERLOO
CLINTON
INKERMAN
BALAKLAVA
DALKEY
ALMA
GILBERT
JULIA CREEK
LIGHT
Legend
Wheel_cact
Not Recorded
Low
Medium
High
N
0 5 10 20 30 40
Kilometers

Wild Artichoke *(Cynara cardunculus)*

Common name(s):	Wild artichoke, artichoke thistle, cardoon	
Plant description:	Wild Artichoke produces annual leaves and flowers from a perennial taproot. The taproot is large, fleshy and grows up to 2 m deep. Leaves mostly appear after autumn rains. Plants grow slowly over winter, then more rapidly in spring. The leaves grow in a rosette from the central taproot. Seedlings develop a taproot in their first year of growth. The rosette leaves are up to 90 cm long and 30 cm wide. They are deeply divided with long rigid spines. The upper surface is greyish-green while the underside has a dense covering of fine white hairs. The rosette leaves start to die as the flower stems emerge in October. The stems are ribbed and spiny and have smaller leaves. Stems normally grow to 1 m high. Flowering takes place from November to February. Flower heads are blue to purple and approximately 10 cm across. The flowers are enclosed by tough spiny bracts. Plants typically have 16 flower heads each but can have up to 50. Each flower can produce 200 seeds. Plants generally flower in their second summer, but can sometimes flower in their first year.	
Weed Risk Assessment Rating:	Non-arable grazing	Protect Sites
	Aquatic	Manage sites

Threats and Impacts

Invasiveness	Wild Artichoke forms dense populations of prickly vegetation that degrade pasture. Once established, it competes with desirable pasture species by shading and drawing moisture and nutrients from the soil. The long, rigid spines on the leaves and flowers deter grazing animals.
Impacts	Wild Artichoke invades native grasslands, grassy woodlands and riparian vegetation where it suppresses native plant growth and degrades fauna habitat. It is a common pest of roadsides and wasteland. Unmanaged infestations quickly form dense thickets which hinder property access and use.
Persistence	Control of Wild Artichoke requires a long-term approach. The key to plant control is to exhaust the seed bank and destroy the large, long-lived taproot.

Current Distribution

State and N&Y NRM region	Wild artichoke is native to the Mediterranean region of southern Europe and northern Africa. It was introduced to Australia as a potential food and fodder plant. Wild Artichoke grows mainly where annual rainfall exceeds 450 mm. It can also invade watercourses, roadsides, drains and wetlands in lower rainfall areas. It is most competitive in heavy clay soils. It is distributed throughout the Northern and Yorke region.
LMN District	Wide spread in the LMN district. Riparian/ watercourses/ cleared disturbed areas. A large infestation is present to the east of Jamestown on the Belalie Creek.
Potential distribution	The plant reproduces almost entirely by seed. Seed is spread by wind, sheep, cattle, water, mud, birds and mice. New plants can develop from fragmented taproots which may be spread through cultivation or grading.

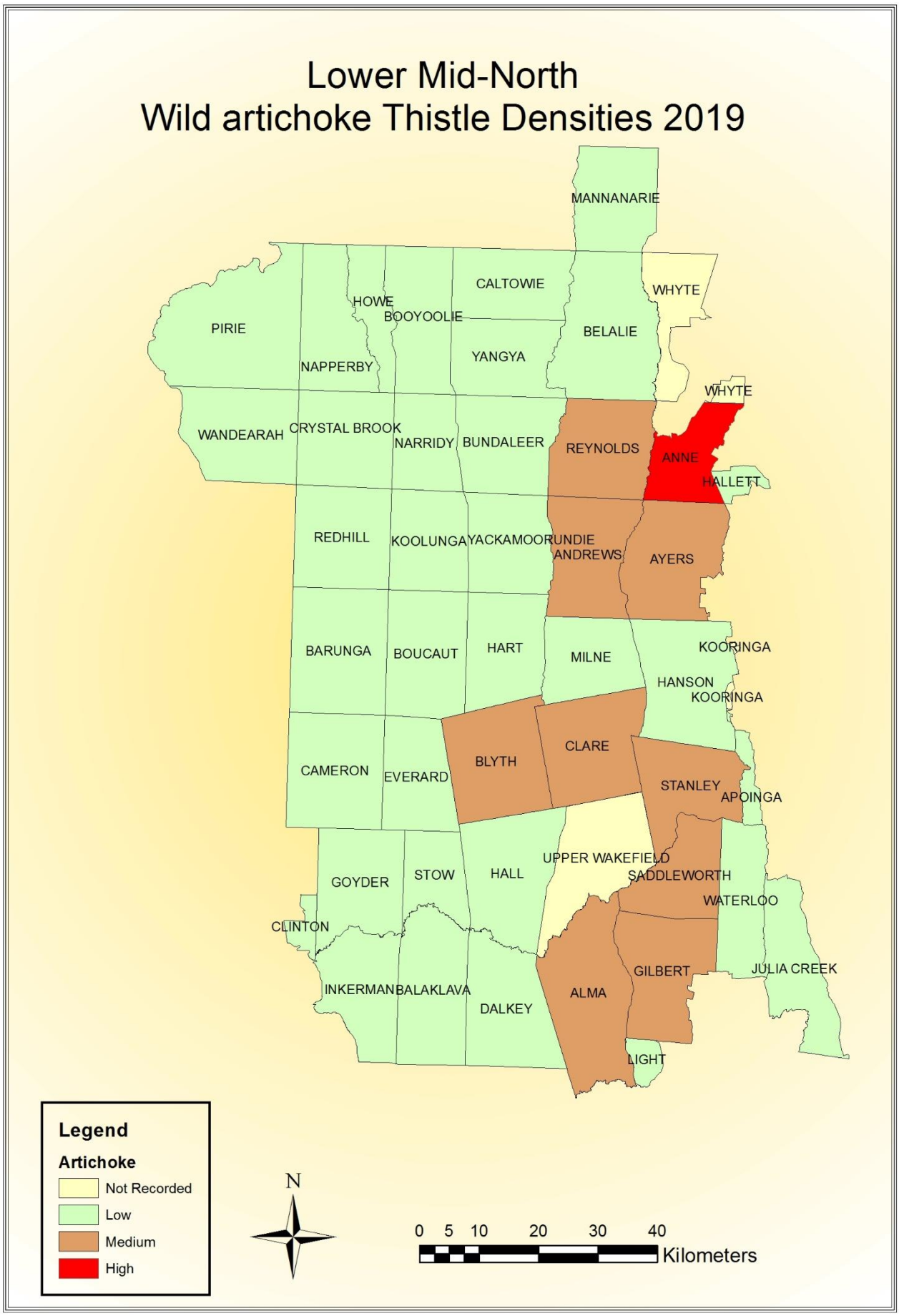
Policy

NRM Act:	Northern and Yorke**:** 175(2), 177(1), 177(2), 182(2), 185

Lower and Mid North District Action Plan

Objectives	• To control any high-priority wild artichoke infestations. • To contain spread from large infestations and prevent reinvasion of lands cleared of wild artichoke in high rainfall areas.
Actions	• Map and record infestations in priority areas during winter/spring weed inspections, identifying the responsible landowner(s). The current priority areas are outliers and new populations in the district and where key assets (Appendix B) are frightened. • Use Declared Plant Property/Roadside Advice Letters for voluntary compliance, reinspecting and following up the next year. • NRM staff or contractors to control roadside infestation through levy/ project funding or the above process and recovering costs from the adjoining landowner. • Develop progressive plans to contain large waterway infestations to prevent degradation of surrounding and downstream lands. • Awareness and education through at least one media release per year, as per the LMN Media

	Plan. • Develop a factsheet to accompany any correspondence with stakeholders.


Lower Mid-North
Wild artichoke Thistle Densities 2019
MANNANARIE
CALTOWIE
WHYTE
HOWE
BOOYOOLIE
PIRIE
BELALIE
YANGYA
NAPPERBY
WHYTE
WANDEARAH
CRYSTAL BROOK
NARRIDY
BUNDALEER
REYNOLDS
ANNE
HALLETT
REDHILL
KOOLUNGA
YACKAMOOR
UNDIE
ANDREWS
AYERS
BARUNGA
BOUCAUT
HART
MILNE
KOORINGA
HANSON
KOORINGA
CLARE
BLYTH
CAMERON
EVERARD
STANLEY
APOINGA
UPPER WAKEFIELD
GOYDER
STOW
HALL
SADDLEWORTH
WATERLOO
CLINTON
GILBERT
JULIA CREEK
INKERMAN
BALAKLAVA
ALMA
DALKEY
LIGHT
Legend
Artichoke
Not Recorded
Low
Medium
High
N
0 5 10 20 30 40
Kilometers

Bibliography and References

- African Boxthorn WoNS Best Practice Manual - http://weeds.ala.org.au/WoNS/africanboxthorn/docs/African_boxthorn-national_best_practice_manual.pdf
- Boneseed 10yr Management Plan – EP and N&Y NRM Board (2008) - http://weeds.ala.org.au/WoNS/bitoubush/docs/Ten_Year_Boneseed_Booklet_10_04_08_maps_smaller1.pdf
  Boneseed Current Management and Control Options - http://weeds.ala.org.au/WoNS/bitoubush/docs/boneseed_intro.pdf
- Bridal Veil; Ecology of *Asparagus declinatus* in SA - http://weeds.ala.org.au/WoNS/bridalcreeper/docs/Asp10Lawrie.pdf
  Bridal Veil; Summary of workshop for SA Regional Groups - http://weeds.ala.org.au/WoNS/bridalcreeper/docs/Asp17Lawrie.pdf
- Buffel Grass Strategic Plan - http://www.pir.sa.gov.au/__data/assets/pdf_file/0019/237340/SA_Buffel_Grass_Strategic_Plan.pdf
  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
- Creeping Knapweed Fact Sheet - https://data.environment.sa.gov.au/Content/Publications/pests_creeping_knapweed.pdf
- Creeping Knapweed: what you should know – https://www.agric.wa.gov.au/declared-plants/creeping-knapweed-what-you-should-know
- SAAL District Weed Plans and Strategies - http://www.naturalresources.sa.gov.au/aridlands/plants-and-animals/pest-plants-and-animals/pest-plants
- Silverleaf Nightshade WoNS Strategic Plan - http://weeds.ala.org.au/WoNS/silverleafnightshade/docs/SLN_Strategic_Plan_030613.pdf
- PIRSA Weed Wisk Management Guide (2008) - http://www.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

Appendix A - NY NRM Board's Roadside Declared Plant Control Policy

Northern & Yorke Natural Resources Management Board

Lower and Mid North

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 group to control 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 group or Board.

At times local government may give a blanket permission to landholders pursuant to section 221 of the Local Government Act , 1999 to conduct control activities on the road reserve (refer attached sample) 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).

Unacceptable 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 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.

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.

Appendix B – Key Assets in the LMN District

Key assets and stakeholders in the Northern and Yorke, Lower and Mid North District.

Refer to the conservation assets in the following documents;

- *Mid North Agricultural Districts Conservation Action Planning Summary 2016*
- *Sustainable Water Conservation Action Planning Summary 2016*
- *Lower North Sustainable Soil Conservation Action Planning Summary 2016*

Industry

- Viticulture
- Wool
- Livestock
- Cropping
- Mining
- Tourism
- Transport
- Infrastructure
- Forestry
- SA Water

Parks

- Bimbowrie CP
- Clements Gap CP
- Martindale CP
- Pualco Range CP
- Spring Gully CP
- Mokota CP

Rivers and Basins

- Broughton River
- Wakefield River
- Gawler River
- Light River

Flora

- 43 populations of 10 EPBC listed flora species:
    - Spiny Daisy
    - Spalding Blown Grass
    - Osborne's Eyebright
    - White Beauty Spider-orchid
    - Bayonet Spider-orchid
    - Ghost Spider-orchid
    - Large-club Spider-orchid
    - Woolcock's Spider-orchid
    - Lowly Greenhood
    - Halbury Greenhood
- Red Stringy Bark
- *Dodonaea procumbens*

Fauna

- Plains-wanderer
- Pygmy Bluetongue Lizard
- Flinders Worm-lizard
- Slender Bell-fruit
- Trailing Hop-bush