

WEEDS OF NATIONAL SIGNIFICANCE



African Boxthorn

(*Lycium ferocissimum*)

**Strategic Plan
2012 to 2017**

© Commonwealth of Australia and the Australian Weeds Committee, 2012

ISBN: 978-0-9803249-8-3

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from the Australian Weeds Committee. Requests and inquiries concerning reproduction and rights should be addressed to the Secretariat, Australian Weeds Committee.

Supporting information about the Australian Weeds Strategy, Weeds of National Significance and progress to date may be found at www.weeds.org.au, where links and downloads provide contact details for all species, their management committees and copies of the strategy.

This strategy was developed under the leadership of Michael Noble, Department of Primary Industries, Water and Environment, Tasmania with full cooperation of all the States, Territories and Commonwealth of Australia.

Comments and constructive criticism are welcomed as an aid to improving the process and future revisions of this strategy.

Published by: Australian Weeds Committee, Canberra

For further information contact:
Secretariat
Australian Weeds Committee
[Insert contact details of AWC]

Publication date: [Month] [Year]

Copies available from:
Invasive Species Branch
Department of Primary Industries, Parks, Water and Environment
PO Box 303
Devonport TAS 7310

Preferred way to cite this publication:

Australian Weeds Committee (2013) *Weeds of National Significance African Boxthorn (Lycium ferocissimum) Strategic Plan*. Australian Weeds Committee, Canberra.

Cover design by: TBA

Cover image: Colin Wilson

The editors have tried to make the information in this product as accurate as possible. However, they do not guarantee that the information is totally accurate or complete. Therefore, you should not rely solely on this information when making a commercial decision.

CONTENTS

EXECUTIVE SUMMARY	1
VISION	2
1 THE CHALLENGE	2
2 INTRODUCTION	3
2.1 Principles underpinning the strategy	3
2.2 The current situation	4
2.3 Strategic plan development	5
2.4 Relevance to other strategies	6
3 STRATEGIC GOALS AND OBJECTIVES	7
3.1 GOAL 1: Prevent new infestations from establishing	9
3.2 GOAL 2: Existing infestations are under strategic management	10
3.3 GOAL 3: Stakeholder capability and willingness to manage African boxthorn increased	11
4 STAKEHOLDER ROLES AND RESPONSIBILITIES	15
5 MONITORING EVALUATION REPORTING AND IMPROVEMENT (MERI)	19
5.1 Targets and Measures	19
5.2 Targets and Measures	19
5.3 Program Logic Model for National African Boxthorn Strategic Plan	23
6 TECHNICAL BACKGROUND	24
6.1 African boxthorn identification	24
6.2 African boxthorn biology and ecology	24
6.3 African boxthorn distribution and spread	24
6.4 Summary of impacts	24
6.5 Control options	25
6.5.1 Chemical and physical control	25
6.5.2 Biological control	25
6.6 Quarantine and legislation	26
7 APPENDICES	27
7.1 Weed control contacts	27
7.2 Current distribution of African boxthorn (<i>Lycium ferocissimum</i>) in Australia*	28
7.3 Other information sources	29
7.4 Definitions	29
7.5 Glossary	29
7.6 References	30

EXECUTIVE SUMMARY

African boxthorn (*Lycium ferocissimum*) is a native of South Africa. It was introduced to Australia in the mid 1800s and was planted in botanical gardens, and as a hedge plant. It is now one of Australia's most widespread weeds, having been recorded in every state and territory in the country.

African boxthorn is a densely branched, perennial shrub with branches that end in sturdy thorns. It has small fleshy leaves and flowers that are coloured white to lilac. Its small fruit start with a smooth green appearance and ripen into an orange-red berry.

In Australia, African boxthorn is found in a broad range of climatic situations ranging from semi-arid inland areas to high rainfall coastal environments. Its fruit are consumed by animals such as birds and foxes, and seed is spread in the landscape when excreted by animals.

African boxthorn displaces native vegetation, and in doing so reduces biodiversity values. However, in some situations, it can provide habitat for threatened species.

It provides impenetrable barriers to livestock and native fauna, reducing access to pasture and water sources.

Effective control of African boxthorn requires the integration of a number of control methods – primarily chemical and physical means. Following up on initial control by managing the seed bank and any reshoot from roots is critical to long term control success.

Weeds of National Significance are declared based on their invasiveness, impacts, potential for spread and significant environmental and socioeconomic impacts. African boxthorn ticks all these boxes, and in 2012 was declared a Weed of National Significance.

This Strategic Plan provides guidance for the first five years of implementing a nationally coordinated approach to managing African boxthorn. A challenge for national coordination of African boxthorn is the significantly differing priorities allocated to the species by different jurisdictions. In some states (such as Victoria), boxthorn is considered to be so widespread that priority is instead directed to less established weed species. In other states (such as South Australia) boxthorn is a high priority in some regions due to its significant potential to spread to un-infested landscapes.

Prevention of new weed infestations is far more cost effective than management of established infestations. This is reflected through actions under the first strategic goal in this plan.

Where infestations have established, the most strategically responsible way to direct resources is toward management where the weed poses threats to priority assets (natural, production, and heritage). This is reflected through actions under the second strategic goal in this strategic plan.

The third goal in this plan seeks to reinforce the capability and willingness of stakeholders to effectively and efficiently implement the first two goals.

The successful achievement of strategic plan objectives relies on the development and maintenance of partnerships between community, industry and government and recognition of the roles of each. These roles are detailed in tables within the plan.

Implementation of the plan through national coordination will be monitored using the Australian Government's Monitoring, Evaluation, Reporting and Improvement (MERI) system. Coordinators create work plans guided by a MERI plan, and report to the Australian Government against the plan.

Vision

The extent and potential of African boxthorn in Australia will be well understood, stakeholders well equipped with information tools and knowledge, and strategic management will contain and reduce the weed's impacts.

1 THE CHALLENGE

African boxthorn (*Lycium ferocissimum*) is a densely branched, perennial shrub growing typically 2-3m in height and with branches that end in sturdy thorns. The species, a member of the plant family Solanaceae, originated in southern Africa and was introduced to Australia by the mid 1800s. It has readily adapted to a wide range of conditions including poor, shallow or rocky soils, salt laden winds, exposed locations and drought.

It can now be found in every state in Australia, in a broad range of climatic situations ranging from semi-arid inland to high rainfall coastal environments. It produces a fruit (berry) that is consumed by animals such as birds and foxes. Seed is spread in the landscape when excreted by animals. This is boxthorn's primary means of spread.

African boxthorn is a Weed of National Significance due to its invasiveness, impacts, potential for spread and significant environmental and socioeconomic impacts.

Once introduced, it displaces native vegetation in both coastal and inland situations, reducing biodiversity values. It readily invades agricultural land, reducing access and usability. Boxthorn provides prime habitat for undesirable animals such as rabbits. It provides impenetrable barriers to livestock, reducing access to pasture and water.

The fruit provides a breeding place for undesirable insects such as fruit fly, and a food source for birds and foxes, which in turn disperse the seed within the fruit. Being spread by animals including birds, African boxthorn is very challenging to contain and can readily spread to new areas including relatively remote coastal islands.



African boxthorn foliage and thorns Photo: Craig Magnussen

2 INTRODUCTION

The African Boxthorn Strategic Plan is necessarily broad in its scope. The Plan applies to African boxthorn (*Lycium ferocissimum*) throughout Australia, and the species is one of the most widespread weeds in the nation.

The Plan seeks to provide a broad and prioritised basis for national coordination of African boxthorn management to proceed. It does not set out to provide in-depth ecology and management information.

With African boxthorn being listed as a Weed of National Significance (WoNS), the Strategic Plan provides the initial step in implementing a nationally coordinated approach to managing the species. The Plan will direct national coordination through at least the first five years. This draft follows initial (early 2012) consultation on new WoNS with every state and territory government by Weeds of National Significance coordinators.

The African Boxthorn Strategic Plan sets out to provide strategic guidance as to where nationally coordinated action will be best applied to achieve national management outcomes.

2.1 Principles underpinning the strategy

The Australian Weeds Strategy (AWS) sets the national direction with relation to weeds. The Weeds of National Significance (WoNS) program forms a significant component of AWS implementation.

This strategic plan also follows the principles of the AWS, which are:

- Weed management is an essential and integral part of the sustainable management of natural resources for the benefit of the economy, the environment, human health and amenity.
- Combating weed problems is a shared responsibility that requires all parties to have a clear understanding of their roles.
- Good science underpins the effective development, monitoring and review of weed management strategies.
- Prioritisation of and investment in weed management must be informed by a risk management approach.
- Prevention and early intervention are the most cost effective techniques for managing weeds.
- Weed management requires coordination among all levels of government in partnership with industry, land and water managers and the community, regardless of tenure.
- Building capacity across government, industry, land and water managers and the community is fundamental to effective weed management.

In addition to the AWS, WoNS strategic plans are also aligned to the 2012 Intergovernmental Agreement on Biosecurity (IGAB; COAG 2012), which outlines national invasive species management objectives. IGAB aims to enhance Australia's biosecurity system by fostering a collaborative approach to minimise the impact of pests across the biosecurity continuum, including 'a national management framework to ensure that nationally significant pests and diseases established in Australia are contained, suppressed or otherwise managed.' WoNS can contribute to this aim by facilitating coordinated, strategic management of nationally significant weeds.

IGAB principles highlight the importance of managing invasive species across the biosecurity continuum. The 'One Biosecurity' report (Beale et al. 2008) also recognises that weeds and other invasive species are biosecurity threats that are most effectively managed in a collaborative manner across this continuum. This includes a 'spatial continuum' of pre-border, border and post-border, as well as a 'management continuum' that spans prevention, eradication, containment and asset protection, depending on the scale of weed invasion.

In most instances, complete control of widespread weeds is unachievable. However, well researched, strategic and coordinated management approaches can reduce current and potential impacts and provide a good return on investment. Effective widespread weed management requires an approach that spans the biosecurity continuum (Figure 1).

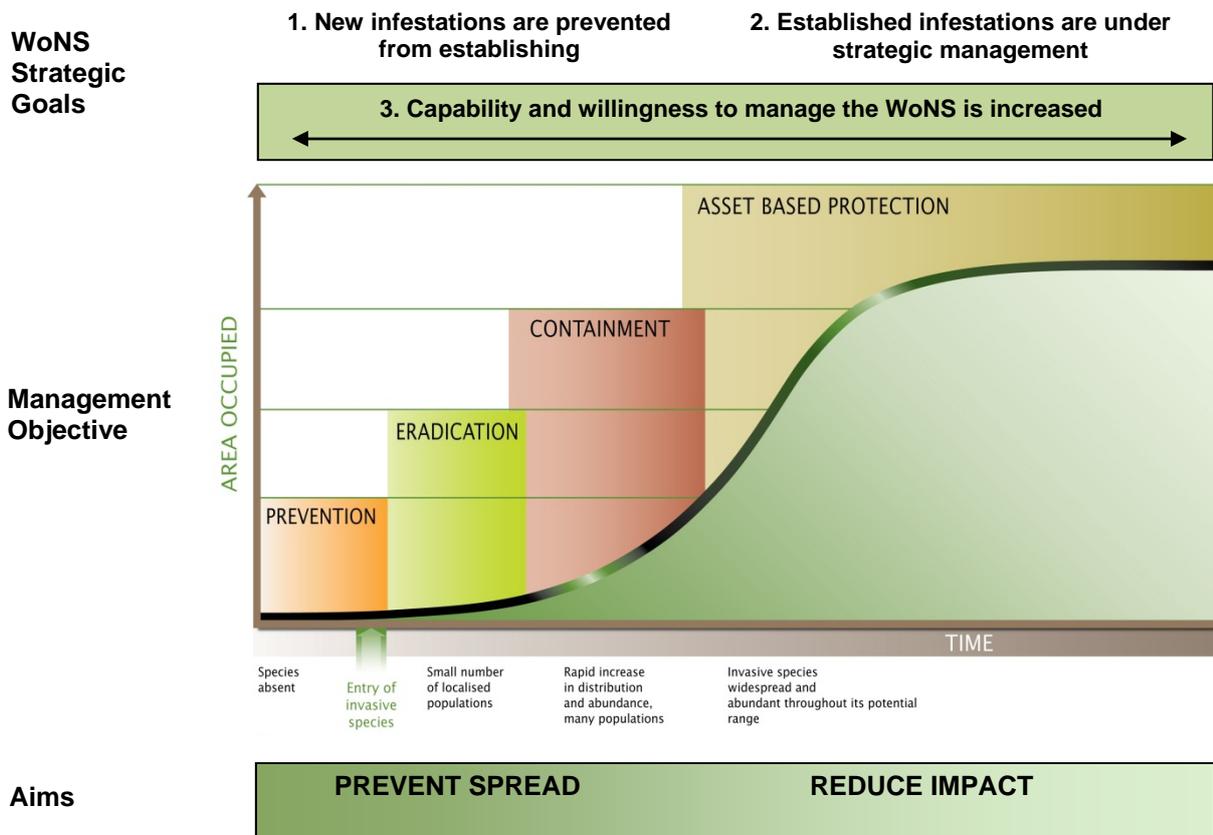


Figure 1 - Biosecurity continuum - Stages of weed invasion with corresponding goals, management objectives and actions at each stage. Modified from (Hobbs and Humphries 1995) and (DPI 2010).

Effective management includes spread prevention practices and eradication of outlying infestations to protect environments where the weed has not yet taken hold; establishment and defence of containment lines to halt or reduce the rate of spread; and the identification and protection of key environmental, social and economic assets in areas where the weeds are already widespread. Paired with these efforts is the need for strong education, extension and capacity building programs, and support mechanisms to ensure on-ground outcomes are achieved.

A Monitoring, Evaluation, Reporting and Improvement (MERI) framework (see section 5) outlines some of the key areas of evaluation for African boxthorn. This framework is general in nature and will be supported by a MERI plan specific to African boxthorn that will be reported on annually.

The program logic diagram in section 5.2 outlines how the actions within this plan will contribute to the attainment of medium to long term outcomes. The logic model also identifies the foundational activities required to build a successful national African boxthorn program where results can be measured and reported on.

2.2 The current situation

African boxthorn has been recorded in every state and territory in Australia. It has been declared under weed legislation in all jurisdictions with the exception of Western Australia. Boxthorn is established across most Australian jurisdictions, the Northern Territory being the exception (although African boxthorn has been recorded there in the past). Across its range boxthorn is in a very broad variety of situations, and has impacts on natural, production and other landscapes.

Consultation has revealed significant concern in numerous jurisdictions regarding the implications of ongoing spread of African boxthorn. On-ground action, particularly to protect natural assets such as island/coastal lands and threatened vegetation communities, has and is being carried out around southern Australia. To date, communication on this between jurisdictions seems to have been limited.

In all states (and the ACT), African boxthorn is a significant issue in inland situations where it is often widespread. In New South Wales, boxthorn is the most frequently cited widespread weed impacting on biodiversity. It is cited by 11 of the 13 NSW catchment management authorities (CMAs) for its threat to biodiversity in their regions. With the species being so widespread in NSW, asset protection (e.g. protection of threatened plant communities) in that state is likely to be a higher priority than prevention, eradication and containment.

Throughout southern Australia, African boxthorn is an invader of riparian and wetland areas. This includes areas listed under the Ramsar treaty and those considered nationally as High Ecological Value Aquatic Ecosystems.

In states including South Australia, Tasmania, and Western Australia boxthorn is of significant concern as an invader of offshore island and coastal vegetation (and impacts on seabird, seal and Australian sea lions habitat). Management work on offshore island infestations has been undertaken in each of these states.

Ironically, African boxthorn can provide critical habitat for important fauna. In areas of coastal Victoria and South Australia it is providing an important habitat for the threatened orange-bellied parrot. At Low Head in Northern Tasmania boxthorn bushes provide protective habitat for a little penguin colony where native vegetation was removed long ago. In Western Australia west coast islands (e.g. Beagle and Abrolhos Islands), boxthorn provides habitat for Australian sea lions, particularly through the provision of shelter during pupping.

Primary limitations to further spread of African boxthorn appear to be in areas with an annual average rainfall of less than 200mm (e.g. the north of South Australia), and northern tropical climate areas (e.g. northern Queensland, Northern Territory and Western Australia).

Boxthorn does not seem to be well established in either higher altitude areas (e.g. those in NSW and Tasmania), or very high rainfall areas (e.g. west coast of Tasmania) in Australia, perhaps indicating that these are factors limiting its potential. There is also suggestion (e.g. Kriticos et al, 2010) that edaphic (soil based) factors (particularly soil fertility) may be important in determining the distribution of boxthorn.

Best practice management of African boxthorn is complex due to the diverse range of habitats it is found in, ranging from semi-arid riparian lands to coastal islands. The often high conservation value flora and fauna found in these locations can be vulnerable to off-target damage if control measures undertaken are inappropriate for the habitat, or to local habitat loss that may arise with the removal of African boxthorn. Hence African boxthorn management needs to be tailored to specific situations.

A challenge for national coordination is the significantly differing jurisdictional priorities allocated to African boxthorn. For example, in South Australia the species is considered a high priority due to significant potential of spread into rangelands and other environments containing priority natural and production assets. However, in Victoria African boxthorn is considered to be so widespread and established that priorities are directed to less well established invasive species.

2.3 Strategic plan development

The African Boxthorn Strategic Plan was initiated with a consultation process in early 2012. Consultation of stakeholders frequently involved stakeholder workshops consulting on most of the new WoNS.

State wide workshops were held in South Australia (Adelaide), Tasmania (Launceston) and Queensland (Brisbane). Regional workshops were held in New South Wales and the ACT. In addition, national coordinators undertook extensive emailing of feedback spreadsheets to stakeholders nationally (including to Western Australia and Victoria), and personal contact was made with key people such as researchers and weed managers.

On 16 & 17 April, 2012 a WoNS State/Territory Agency National Strategy Workshop was held in Adelaide. Representatives from all state jurisdictions attended this. During those two days the principles that underpin

this plan (and many other new WoNS plans) were agreed upon. The objectives and strategic actions that form the core of this plan have their basis in the extensive feedback provided during the second day of the Adelaide workshop.

The Plan was submitted to the Australian Weeds Committee for comment by all jurisdictions in July 2012. Further public comment and contribution was sought via a 30-day public consultation period. Feedback was incorporated and the Plan was endorsed by the Australian Weeds Committee in 2013.

2.4 Relevance to other strategies

At a national level, the Australian Weeds Strategy provides direction on weed management issues. Weeds of National Significance (WoNS) are a significant component of the implementation of the Australian Weeds Strategy. There are 32 species or groups now listed as WoNS. This Strategic Plan is to direct national coordination for one of these – African boxthorn.

National strategies for other new WoNS have been developed often with cooperative and overlapping consultation with jurisdictions and other stakeholders. For this reason in particular, many actions contained within the African Boxthorn Strategic Plan will be shared by other new WoNS plans. These actions will be most effectively implemented through collaborative efforts by national coordinators. For example, development and promotion of weed hygiene management tools and techniques is an action of likely interest in national coordination of multiple WoNS, and so a collaborative effort in developing these is most sensible.

Successful implementation of the African Boxthorn Strategic Plan is significantly reliant on the incorporation of relevant aspects into jurisdictional (state and territory), regional and local strategies and plans. As relevant strategies and plans are developed or reviewed, relevant aspects of this and other WoNS national strategies need to be considered, and where possible, incorporated.

Table 1 summarises the national context for the African Boxthorn Strategic Plan.

Table 1. Relevance to other strategies – the national context

2.4.1.1.1.1.1 Scale	2.4.1.1.1.1.2 Strategies and Plans
National	Biodiversity Conservation Strategy 2010 - 2030 ↓ Australian Weeds Strategy ↓ African Boxthorn National Strategy
Jurisdiction (state or territory)	Victoria <i>Invasive Plants and Animals Policy Framework</i> New South Wales <i>NSW Invasive Species Plan (Biodiversity Priorities for Widespread Weeds)</i> Queensland <i>Queensland Weed Strategy</i> Tasmania <i>WeedPlan – Tasmania’s Weed Management Strategy</i> South Australia <i>State Natural Resources Management Plan</i> Western Australia <i>A Weed Plan for Western Australia</i> Australian Capital Territory <i>ACT Weeds Strategy</i> Northern Territory

	<i>The Northern Territory Weeds Management Strategy</i>
Regional	Catchment Management Authority/Natural Resource Management strategies Catchment Management Authority/Natural Resource Management weed or pest management plans Regional weed management authorities Public authority regional pest strategies (e.g. parks and wildlife service regional pest management strategies)
Local	Local government weed or pest management plans and development plans

3 STRATEGIC GOALS AND OBJECTIVES

Strategic goals and objectives used here reflect the strategic management priorities applied successfully in national coordination of the first twenty WoNS.

Prevention of new weed infestations is far more cost effective than management of established infestations. The first strategic goal is about prevention of establishment of new infestations. Implementing this may include targeted eradication of outlier infestations and containment of core infestations. With regard to African boxthorn, this might apply to preventing infestation of offshore islands, areas of rangeland, riparian and wetland areas and other vulnerable environments.

Where infestations have established, the most strategic approach is to direct resources to areas where the weed poses threats to natural (e.g. threatened species/communities), production (e.g. agriculture or forestry), heritage (indigenous and European), and other priority assets. The second goal seeks to strategically manage established infestations essentially through first targeting areas where priority assets are threatened.

The third strategic goal “stakeholder capability and willingness to manage African boxthorn increased” sets out to reinforce the capability and willingness of stakeholders to effectively and efficiently implement the first two goals as top priorities. This includes the provision of best practice management information, national mapping, education and awareness, identification and promotion of priority research and research findings, and more. This goal in addition provides the means through which progress can be made with less strategic infestations (for example, promoting development of biological control options for core infestations).

As a package, the strategic goals and objectives are about preventing spread, protecting priority assets, and reinforcing capability and willingness to do these things in a strategic manner. These are summarized in Table 2 below, and detailed into actions in section 3 that follows.

Actions in section 3 have been prioritized 1, 2 or 3 based on the following:

- Priority 1 – critical to the success of the strategy e.g. (urgent) timeline around priority levels
- Priority 2 – highly beneficial and will contribute significantly to the success of the strategy
- Priority 3 - desirable, still beneficial, but not critical to success of the strategy

Table 2. Strategic goals and objectives

Strategic Goal	Objectives
1. Prevent new infestations from establishing	1.1 Invasion vectors, sources and pathways are identified and managed to prevent or reduce spread
	1.2 Surveillance and response mechanisms are ensuring timely detection of the infestations (both new and previously undetected)

	1.3 Priority outlier infestations are contained or eradicated and spread from core infestations is prevented
2. Existing infestations are under strategic management	2.1 Priority assets are benefitting from long term strategic weed control programs
	2.2 Holistic weed and land/water management practices are improving natural ecosystem condition, sustainable production and community wellbeing
3. Stakeholder capability and willingness to manage African boxthorn increased	3.1 Infestations are mapped to national standards and to a level sufficient to inform decision making
	3.2 Best practice management delivers efficient, effective and long-term control
	3.3 Capability and motivation to manage are enhanced by education and awareness
	3.4 Research priorities are identified, promoted, addressed and results are informing management
	3.5 Local to national plans incorporate strategic WoNS priorities
	3.6 Stakeholders are committed to effective delivery of the strategic plan
	3.7 Appropriate policies, codes of practice, legislation and enforcement are supporting strategic management objectives
	3.8 The national strategic plan is relevant and effective

3.1 GOAL 1: Prevent new infestations from establishing

The first strategic goal is about the most cost effective weed management option - prevention of establishment of new infestations. Implementing this may include active surveillance, rapid response to new incursions, and targeted eradication of outlier infestations and containment of core infestations.

African boxthorn is spread primarily when animals such as birds and foxes, eat the fruit and excrete the seed. The nature of spread in this relatively random manner adds complexity to management actions such as containment. With there being a period of approximately two years from germination to reproductive capacity with African boxthorn plants, active surveillance and rapid response are critical aspects of management to contain spread.

Objectives	Strategic Actions	Priority	Responsible Partners
1.1 Invasion vectors, sources and pathways are identified and managed to prevent or reduce spread	1.1.1 Identify limits of existing infestations and determine clean/unsuitable areas, and promote active surveillance and rapid response measures	1	National coordinator/s, management committee, state/territory jurisdictions, regional bodies and local government
	1.1.2 Identify invasion vectors and sources using tools such as pathway analysis software*	1	National coordinator/s, management committees, state/territory jurisdictions, regional bodies, local government and industry
	1.1.3 Promote management of vectors, sources and pathways to prevent or reduce spread	1	Local government, regional bodies, state/territory jurisdictions, and industry
	1.1.4 Develop and promote hygiene management tools and techniques*	3	National coordinator/s, state/territory jurisdictions, and industry
1.2 Surveillance and response mechanisms are ensuring timely detection of the infestations (both new and previously undetected)	1.2.1 Identify existing surveillance systems (including Weed Spotters type programs)*	1	National coordinator/s, local government, regional bodies, state/territory jurisdictions, and industry
	1.2.2 Promote development of necessary additional surveillance tools and techniques and related guide materials*	2	National coordinator/s, management committee, local government, regional bodies, state/territory jurisdictions, and industry
	1.2.3 Promote active surveillance, and surveillance-informed rapid response	1	National coordinator/s, local

		to new incursions in regional and local areas currently free of African boxthorn		government, regional bodies, state/territory jurisdictions, and industry
1.3 Priority outlier infestations are contained or eradicated and spread from core infestations is prevented	1.3.1	Identify outliers and promote establishment of eradication programs and containment lines	1	National coordinator/s, state/territory jurisdictions, regional bodies and local government
	1.3.2	Engage and support relevant communities/jurisdictions to implement eradication programs and containment lines	1	National coordinator/s, management committee, local government, regional bodies, and state/territory jurisdictions
	1.3.3	Promote and support on-ground actions aimed at achieving prevention of spread from core infestations	1	National coordinator/s, local government, regional bodies, state/territory jurisdictions, and industry
	1.3.4	Establish and maintain an investment priorities spreadsheet for regions nationwide*	2	National coordinator/s and management committees

*Actions that would benefit from a coordinated effort across WoNS

3.2 GOAL 2: Existing infestations are under strategic management

The second goal seeks to strategically manage established infestations essentially through prioritising areas where assets are threatened. Specifically, this means directing resources to areas where the weed poses threats to natural (e.g. threatened species/communities), production (e.g. agriculture or forestry), cultural heritage (e.g. indigenous and European), and other assets.

African boxthorn is widespread in southern Australia. It is known to be impacting on significant national and/or jurisdictional assets such as high value coastal/island, wetland, riparian, and production lands.

Objectives	Strategic Actions	Priority	Responsible Partners	
2.1 Priority assets are benefitting from long-term strategic weed control programs	2.1.1	Develop a nationwide assessment process (such as a risk matrix), to identify and prioritise natural, production and cultural heritage assets at threat from African boxthorn, and focus management expenditure on areas where the benefits of management clearly exceed the costs*	1	National coordinator/s, management committee, state/territory jurisdictions, and regional bodies
	2.1.2	Promote development and implementation of regional and/or local weed management plans consistent with the African Boxthorn Strategic	1	National coordinator/s, local government, regional bodies, and state/territory

	Plan		jurisdictions
	2.1.3 Promote and support on-ground actions consistent with achieving strategic protection of assets from threats posed by African boxthorn	1	National coordinator/s, state/territory jurisdictions, regional bodies, and local government
	2.1.4 Identify and increase stakeholder awareness of situations where boxthorn is providing conservation benefits (e.g. orange-bellied parrot habitat in Victoria and South Australia)	2	National coordinator/s, state/territory jurisdictions, regional bodies, and local government
	2.1.5 Develop and produce materials outlining wildlife habitat values/situations of boxthorn, and provision of alternatives prior to removal and landscape restoration post removal*	2	National coordinator/s, management committee, state/territory jurisdictions, regional bodies, and local government
2.2 Holistic weed and land/water management practices are improving natural ecosystem condition, sustainable production and community wellbeing	2.2.1 Promote and support implementation of coordinated landscape scale (and multi-species) approaches to weed management	1	National coordinator/s, management committee, regional bodies, state/territory jurisdictions, and local government
	2.2.2 Produce best practice materials for African boxthorn management in offshore island and coastal situations, and other sensitive environments (in addition to broad best practice management materials –see objective 3.2)	1	National coordinator/s, management committee, state/territory jurisdictions, and regional bodies
	2.2.3 Produce materials to promote awareness of weed management and activity/action into daily activities of the broader community*	1	National coordinator/s and management committee

*Actions that would benefit from a coordinated effort across WoNS

3.3 GOAL 3: Stakeholder capability and willingness to manage African boxthorn increased

The third strategic goal sets an agenda to reinforce the capability and willingness of stakeholders to effectively and efficiently implement the first two goals. This includes the provision of best practice management information, national mapping, education and awareness, identification and promotion of priority research findings.

African boxthorn mapping across the nation is of various type and accuracy. National modeling/mapping of boxthorn's potential distribution is sometimes inaccurate. Prioritising and taking action nationally is of dubious value until accurate national distribution and potential distribution data is available.

Modeling of climate change influenced distribution of African boxthorn has been completed by Wilson *et al* (2011). Please refer to section 7.6 (References) for full details.

Community awareness of African boxthorn and its impacts is variable across the nation. Improved education and awareness of the species and its impacts will almost certainly assist with the implementation of regional and local management actions. As boxthorn is dispersed by fauna (such as birds), it is particularly important that where management is undertaken, it be a consistent effort across landholdings. Increased awareness of boxthorn and its impacts are likely to assist this.

There is no recognised biological control agent currently available in Australia. Research into this and other African boxthorn ecology and management factors have been lacking to date. An increased, targeted research effort will improve our nationwide understanding of African boxthorn and its management, in turn increasing the efficiency and effectiveness of our management efforts.

Objectives	Strategic Actions	Priority	Responsible Partners
3.1 Infestations are mapped to national standards and to a level sufficient to inform decision making	3.1.1 Collate existing spatial data available and develop national distribution mapping*	1	Local government, regional bodies, state/territory jurisdictions, and industry
	3.1.2 Produce potential distribution mapping with predicted climate change scenarios incorporated*	1	National coordinator/s, researchers, and state/territory jurisdictions
	3.1.3 Identify and develop mapping data incorporating priority assets threatened by boxthorn, also outlining where relevant management work has been completed*	1	National coordinator/s, regional bodies, state/territory jurisdictions, local government, and industry
	3.1.4 Support and promote national mapping standard and national mapping*	2	Australian Government, national coordinator/s, and state/territory jurisdictions
	3.1.5 Develop a case study of mapping (to best practice) from local to national level*	2	National coordinator/s and management committee
3.2 Best practice management delivers efficient, effective and long-term control	3.2.1 Produce a best practice manual for African boxthorn incorporating: <ul style="list-style-type: none"> best practice control methods for coastal, riparian, production, bushland and rangeland environments site rehabilitation and revegetation following African boxthorn management works* 	1	National coordinator/s, management committee, and state/territory jurisdictions

	3.2.2	Promote integrated weed management practices based on established best practice	1	National coordinator/s, management committee, local government, regional bodies, state/territory jurisdictions, and industry
	3.2.3	Develop a decision support tool to assist in planning, management and rehabilitation work in different situations*	2	National coordinator/s, researchers, management committee, local government, regional bodies, state/territory jurisdictions, and industry
	3.2.4	Develop a database that incorporates existing best practice information, case studies and extension material from across jurisdictions (i.e. a data library)*	2	National coordinator/s, regional bodies, state/territory jurisdictions, local government and industry
3.3 Capability and motivation to manage are enhanced by education and awareness	3.3.1	Develop a communications strategy incorporating the identification of target audiences*	1	National coordinator/s
	3.3.2	Develop and distribute African boxthorn impact information as a motivator to manage where evidence suggests motivation is lower	1	National coordinator/s, management committee, regional bodies, state/territory jurisdictions, and local government
	3.3.3	Where evidence suggests land use change is facilitating expansion of boxthorn (e.g. new peri-urban and mining), target relevant stakeholders with education and awareness support and materials	1	National coordinator/s, local government, regional bodies, state/territory jurisdictions, and industry
3.4 Research priorities are identified, promoted, addressed, and results are informing management	3.4.1	Investigate, compile information and promote knowledge on the environmental, economic and social impacts of boxthorn, and the likely annual cost of control of boxthorn in Australia	1	National coordinator/s
	3.4.2	Promote investigation on the research, approval and introduction to Australia of suitable bio control agents for African boxthorn	1	National coordinator/s, researchers, and state/territory jurisdictions
	3.4.3	Promote research on multi pest species management approaches, including investigating the role of pest animals such as foxes, exotic bird	1	National coordinator/s, researchers, and state/territory

	species, and rabbits.		jurisdictions
	3.4.4 Identify and/or develop and distribute tools for remote sensing of African boxthorn	2	National coordinator/s, researchers, and state/territory jurisdictions
	3.4.5 Promote further research into the impacts of climate change on African boxthorn (including how the species might respond to changes in coastal and riparian environments)	3	National coordinator/s, researchers, and industry
	3.4.6 Facilitate research into the relationships between land use/management change (e.g. to peri-urban, hobby farms or mining) and African boxthorn spread	3	National coordinator/s, researchers, regional bodies, local government, and state/territory jurisdictions
3.5 Local to national plans incorporate strategic WoNS priorities	3.5.1 Identify and create a database of key African boxthorn stakeholder groups across Australia	1	National coordinator/s, regional bodies, state/territory jurisdictions, and local government
	3.5.2 Provide advice to relevant stakeholder/regional bodies and promote incorporation of African boxthorn management priorities into plans and policies	1	National coordinator/s, regional bodies, state/territory jurisdictions, local government, and industry
	3.5.3 Promote African boxthorn management planning and strategic best practice management through targeted communications such as workshops and research forums	1	National coordinator/s and management committee
3.6 Stakeholders are committed to effective delivery of the strategic plan	3.6.1 Establish processes for coordinated implementation of the Strategic Plan (e.g. management committee or taskforce)	1	National coordinator/s and Australian Weeds Committee
	3.6.2 Develop initiatives for reaffirming regional and local commitment (e.g. memoranda of understanding style commitment)	2	National coordinator/s, management committee, local government, regional bodies, state/territory jurisdictions, and industry
3.7 Appropriate policies, codes of practice, legislation	3.7.1 Assess the effectiveness of legislative coverage of African boxthorn across jurisdictions (including impediments to effective national management), and promote application of most nationally beneficial legislative classes and	1	National coordinator/s, regional bodies, local government, and Australian Weeds Committee

and enforcement are supporting strategic management objectives	management practices		
	3.7.2 Promote and facilitate the establishment and/or inclusion of boxthorn management provisions in relevant industry codes of practice and market based instruments	2	National coordinator/s, industry, state and territory jurisdictions, and Australian Weeds Committee
3.8 The national strategic plan is relevant and effective	3.8.1 Develop a MERI (Monitoring, Evaluation, Review and Improvement) plan to measure ongoing relevance and effectiveness of implementation of the African Boxthorn National Strategy	1	National coordinator/s, state and territory jurisdictions, and Australian Weeds Committee
	3.8.2 Utilise baseline data (including MERI) to inform stakeholders on the progress of the Strategic Plan	1	National coordinator/s and Australian Weeds Committee

*Actions that would benefit from a coordinated effort across WoNS

4 STAKEHOLDER ROLES AND RESPONSIBILITIES

While land owners and managers are ultimately responsible for the control of African boxthorn on their land, the effective implementation of this strategy requires the involvement of a range of stakeholders. It is also noted that stakeholders responsibilities may vary between jurisdictions and that some may be optional while others are prescribed by legislation.

The successful achievement of strategy objectives relies on the development and maintenance of partnerships between community, industry and government and recognition of the roles of each stakeholder. Suggested responsibilities to assist in achieving these are:

Australian Government

- Ensure quarantine controls to prevent importation (AQIS)
- Undertake strategic African boxthorn control on all Australian Government managed lands

Australian Weeds Committee

- Provide governance processes for the effective delivery of the WoNS initiative
- Provide a mechanism for identifying and resolving weed issues at a national level
- Facilitate coordination between the Australian, State and Territory Governments on weed management policy and programs
- Provide advice to the National Biosecurity Committee on weeds issues
- Provide planning, coordination and monitoring of the implementation of the Australian Weeds Strategy
- Oversee the implementation of the activities described in the WoNS strategies
- Promote the importance and benefits of the WoNS program to all levels of government.

National African boxthorn Management Group (or similar taskforce/national management group)

- Ensure a diversity of community and agency views are represented for effective strategy implementation
- Provide guidance, direction and policy advice for the management of African boxthorn through the delivery of the strategic plan
- Monitor, evaluate, report and improve strategy implementation
- Assist in the development and implementation of programs and initiatives which support strategic actions
- Maintain and build partnerships with key stakeholders to improve strategic African boxthorn management
- Identify funding sources and provide independent advice for prospective applicants for projects consistent with the needs of the African boxthorn strategic plan.

Research institutions (e.g. CSIRO, Universities, government agencies, industry)

- Applied research to address priority national strategic requirements
- Identify research gaps and seek innovative solutions for the management of African boxthorn
- Seek new and on-going funding and support for research requirements

State and Territory agencies

- Promote the status of African boxthorn as a WoNS, its impacts and the importance of management
- Maintain appropriate legislation and policies to achieve state and territory based objectives for managing African boxthorn.
- Administer and enforce legislation where applicable (e.g. in Tas)
- Coordinate African boxthorn control and management at a jurisdictional level to foster the delivery of the African boxthorn National Strategic Plan.
- Work closely with regional bodies, local governments, communities and other stakeholders to prevent and minimise African boxthorn impacts.
- Identify strategic management areas and associated objectives
- Promote consistency with this Strategy in jurisdictional pest management plans
- Facilitate the inclusion of strategic African boxthorn management in pest management planning processes with secondary stakeholders
- Contribute to priority research initiatives
- Source funding for strategic management programs and research
- Implement monitoring and reporting protocols in line with the MERI plan and provide relevant information to the national taskforce and/or Australian Weeds Committee
- Develop and implement communication and extension plans where appropriate
- Facilitate state and territory level mapping and contribute to national mapping initiatives
- Ensure, where appropriate, participation on the National African boxthorn Management Group or similar national taskforce.

Regional natural resource management (catchment management)

- Incorporate African boxthorn objectives in relevant pest management plans and implement coordinated, on-ground actions with local stakeholders
- Administer and enforce legislation where applicable (e.g. in SA)
- Source funding and/or contribute to strategic control programs

- Improve regional awareness of impacts and identification; and promote early detection.
- Participate in regional mapping initiatives and contribute to state, territory and national map production
- Provide substantial input into state and national policy development (e.g. in WA)

Local governments

- Incorporate African boxthorn objectives in relevant pest management plans and monitor implementation
- Administer and enforce legislation where applicable (e.g. in NSW)
- Undertake surveying and mapping particularly in relation to outlying African boxthorn infestations
- Establish local management policies to contribute to strategic control, containment and/or asset protection objectives
- Improve community awareness of impacts and identification; and promote early detection
- Control African boxthorn on local government managed or owned land
- Facilitate the removal of urban plantings of African boxthorn
- Source funding and/or contribute to strategic control programs

Community, conservation and other interest groups

- Contribute local and regional perspectives to African boxthorn management
- Contribute to the development, implementation and/or review of local and regional pest management plans
- Promote and contribute to local and regional containment and/or management programs in partnership with relevant stakeholders
- Support and/or develop African boxthorn funding submissions in line with national priorities
- Participate in local and regional mapping initiatives and contribute to state, territory and national map production
- Promote awareness and best practice management through event coordination and product distribution.

Industry

- Promote and adopt best practice management of African boxthorn
- Identify gaps and issues associated with implementation of the African boxthorn national strategy
- Contribute to research and development of management practices to support industry members
- Ensure awareness of sale and movement restrictions of African boxthorn within industry members
- Improve community awareness of impacts and identification; and promote early detection.

Land managers

- Manage and control African boxthorn on lands in accordance with State/Territory or local government legislation and policy
- Improve knowledge of the identification, impacts and best practice management of African boxthorn
- Identify African boxthorn and other weeds threatening the property
- Undertake any necessary planning and mapping
- Implement best practice management
- Implement weed hygiene and other management practices to minimise spread of African boxthorn
- Source funding and/or contribute to strategic control programs*

- Participate in regional mapping initiatives and contribute to State, Territory and national map production*
- Provide input into State and national policy development*

(* Applies primarily to public land managers)

5 MONITORING EVALUATION REPORTING AND IMPROVEMENT (MERI)

MERI is the Australian Government system for monitoring, evaluation, reporting and improvement in natural resource management. Weeds of National Significance (WoNS) national coordinators draft an annual MERI plan, and report to the Australian Government against their MERI plan.

A priority action spreadsheet is developed and updated annually by WoNS coordinators. This outlines priorities for each WoNS by region. The spreadsheet guides prioritisation within work plans, along with decision-making on funding allocations under the Australian Government's Caring for Our Country.

5.1 Targets and Measures

5.2 Targets and Measures

Strategic Plan Goals	Key Evaluation Questions	Data/Evidence Required	Consider
1. New infestations are prevented from establishing.	To what extent have new infestations been prevented from establishing?	<u>1.1 National distribution data</u> <ul style="list-style-type: none"> Has the national distribution map been reviewed and/or updated? Has the Priority Management Action spreadsheet been updated? 	<ul style="list-style-type: none"> Are these documents publicly available? Have stakeholders been advised of any changes? Where is this data/info stored? Do they capture national priorities?
		<u>1.2 New infestations</u> <ul style="list-style-type: none"> Number of new outlier infestations¹ recorded. Percentage of known infestations actively controlled. <p>¹ New infestations should be an outlier, outside existing distribution of WoNS</p>	<ul style="list-style-type: none"> Are any new outlier infestations occurring in areas identified as a high priority in the national strategy? How were infestations detected (passive or active surveillance, community reporting etc)? Have high risk pathways been adequately identified? And threats minimised?

		<u>1.3 Eradication & containment programs</u> <ul style="list-style-type: none"> Percentage of eradication and/or containment programs being maintained 	<ul style="list-style-type: none"> What percentage of programs identified in the strategic plan or by the management group are being actively managed? Is there a plan in place for ongoing management? How is progress being monitored and reported to stakeholders? Can include examples using case studies.
		<u>1.4 Legislation</u> <ul style="list-style-type: none"> Have there been any legislation or policy changes for this species? Has a need for legislative change been identified by stakeholders? 	<ul style="list-style-type: none"> Are minimum requirements being maintained (e.g. ban on sale, trade, movement)? Is control required throughout or in part of jurisdiction? Is compliance actively enforced?
		Overall progress rating	
2. Existing infestations are under strategic management.	<p>To what extent is integrated weed management effectively managing core infestations?</p> <p>To what extent are assets being protected through</p>	<u>2.1 Integrated Weed Management</u> <ul style="list-style-type: none"> How effective are IWM programs? 	<ul style="list-style-type: none"> Are existing tools providing adequate control of WoNS? Have new advances/technologies been developed and are they incorporated into BPM information? Are there barriers to adoption of best practice management? Are research programs addressing any observed gaps (e.g. herbicide trials, biocontrol, restoration requirements post control)?
		<u>2.2 Asset protection</u> <ul style="list-style-type: none"> Number of priority assets identified as 'at risk' 	<ul style="list-style-type: none"> Response should include status report on progress towards asset protection programs.

	strategic management?	<p>from WoNS?</p> <ul style="list-style-type: none"> Percentage of priority assets being protected (eg assessed against relevant Threat Abatement Plans or jurisdictional equivalents)? Percentage of state/regional invasive species plans that identify priority assets at risk from WoNS? 	<ul style="list-style-type: none"> Methods by which assets are being protected (e.g. targeted annual spray programs, high risk pathway surveillance, and strategic plans). Are long term monitoring programs in place to detect change (e.g. using a similar format to “Monitoring Manual for Bitou Bush Control and Native Plant Recovery”)? To what extent is management leading to an improvement in asset condition?
		Overall progress rating	
3. Greater capability and commitment to manage WoNS.	To what extent has the capability and commitment to manage WoNS increased?	<u>3.1 Community engagement & awareness</u> <ul style="list-style-type: none"> What is the status of best practice information? Are partnerships being maintained to ensure collaboration on WoNS? Number and type of media activities. 	<ul style="list-style-type: none"> Is best practice information up to date and readily available? Is this information and/or advice being targeted to priority regions. Is training being delivered to meet the needs of weed managers (including the community)? Are networks/groups being supported (e.g. through dissemination of research outcomes, funding opportunities, control options etc)? Has awareness and engagement in WoNS management been raised effectively?
		<u>3.2 Resourcing</u> <ul style="list-style-type: none"> From what sources are programs being funded? 	<ul style="list-style-type: none"> Number of projects funded by Commonwealth, jurisdictions, industry, etc

		<u>3.3 Policy & Planning</u> <ul style="list-style-type: none"> • Are the objectives of the strategy being integrated into commonwealth/state/regional plans, policies and programs? • Has cross border collaboration occurred? 	<ul style="list-style-type: none"> • How are priorities reflected in planning and policy approaches? E.g. WRA, invasive species plans, asset protection plans, district plans, weed spread prevention activities, management programs, incentive programs, state working groups. • How are national priorities being maintained? E.g. containment lines, eradication targets, training & awareness raising, research projects.
		Overall progress rating	
Continuous improvement	Are there any unexpected outcomes that have been identified through implementation of strategy?	<u>4.1 Barriers</u> <ul style="list-style-type: none"> • Have any other management issues or impediments been identified? 	

How to score progress rating

1- Insufficient evidence to score

2- No progress against goal

3- Limited progress is being made against this goal

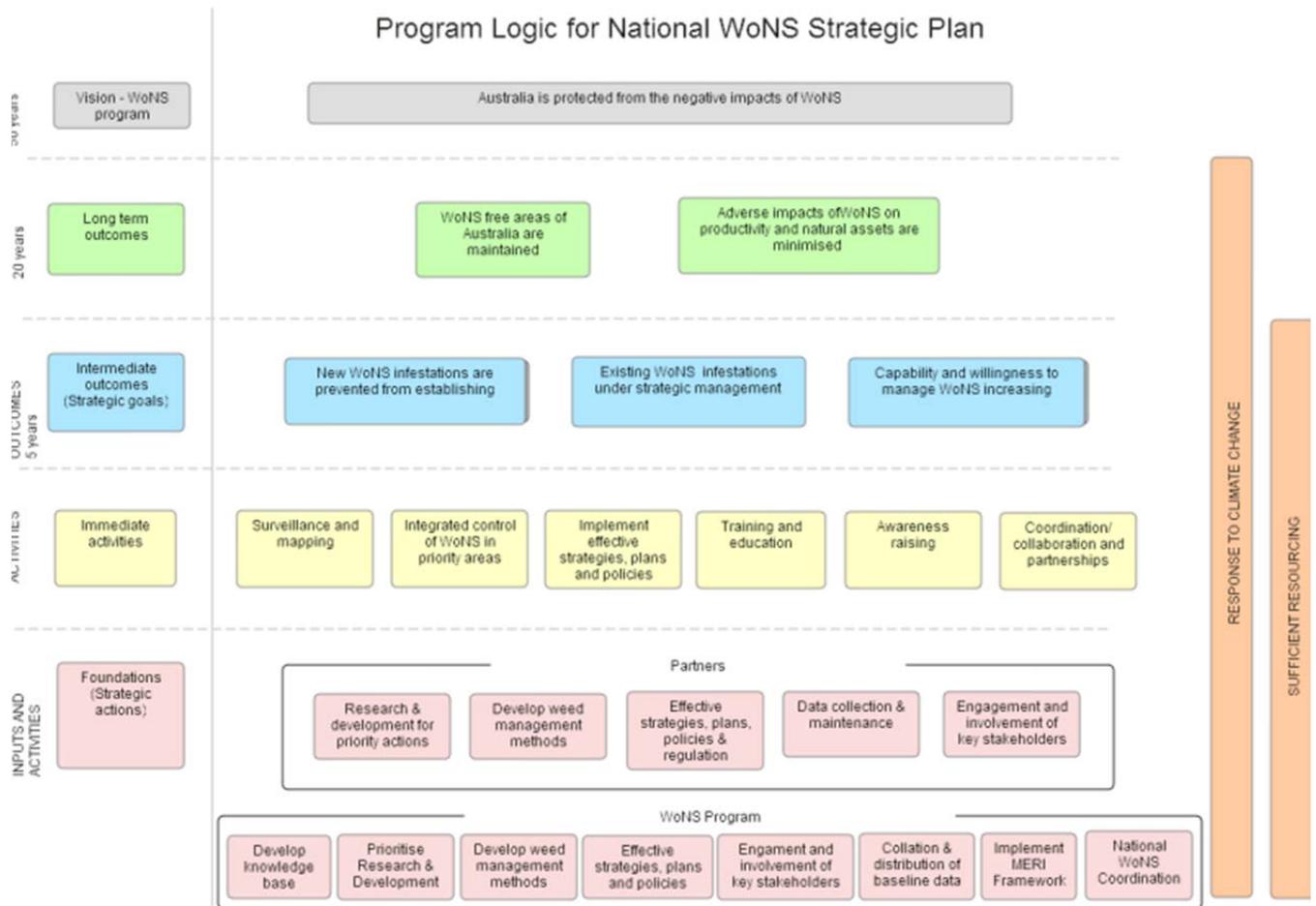
4- Reasonable progress is being made against this goal

5- Excellent progress is being made against this goal

5.3 Program Logic Model for National African Boxthorn Strategic Plan

Vision:

The extent and potential of African boxthorn in Australia will be well understood, stakeholders well equipped with information tools and knowledge, and strategic management will contain and reduce the weed's impacts.



6 Technical Background

6.1 African boxthorn identification

African boxthorn (*Lycium ferocissimum*) is in many circumstances a densely branched, perennial shrub growing to 4m high, but more often 2-3m. However, in coastal and offshore island (windy, salt laden) environments, it can take a significantly different form, potentially being bonsai-like, or with prostrate plants growing up to 10m in width.

Leaf nodes and branch ends have long, sturdy thorns. It has slightly fleshy, oblong leaves up to 40mm long, growing in clusters.

Flowers are approximately 10-12mm in diameter and hang from the leaf axils on stalks, singly or in pairs. They are white to lilac, have five petal lobes, often with a lilac base to each lobe. Fruit is 5-12 mm long starting with a smooth green appearance

There are numerous native flora species that could be mistaken for African boxthorn. For example, Australian boxthorn (*Lycium australe*) grows across southern mainland Australia, mainly in drier areas west of the Great Dividing Range. Other examples of Australian natives with similar appearance include tree violet (*Hymenanthera dentata*), native gorse (*Daviesia ulicifolia*), and spiky anchor plant (*Discaria pubescens*).

6.2 African boxthorn biology and ecology

African boxthorn is a native of South Africa and has become widely established in Australia having been deliberately introduced as a hedge plant during the nineteenth century.

The species mostly flowers and seeds in summer, but can do so year round. Seedlings germinate at any time of the year. Flowering and seeding begins when plants are two years of age.

Boxthorn has a long, deep root system and soil disturbance results in the root system sending up shoots.

6.3 African boxthorn distribution and spread

From the mid 1800s African boxthorn appeared in Australian nursery catalogues, was grown in botanical gardens, and was recommended for planting as a hedge plant.

African boxthorn has been recorded in all states and territories in Australia and is one of the nation's most widespread weeds. A map of African boxthorn distribution in Australia is included in the appendices (section 7.2). It thrives in island and coastal through to semi-arid environments, and from temperate to sub-tropical climate areas.

Dispersal is primarily via seed with the fruits being consumed by animals including birds and foxes. When seeds are excreted, they remain viable. Distribution by birds makes even localised eradication and containment of the species challenging to achieve.

African boxthorn is found on island and in coastal situations in most states of Australia, and readily displaces local native vegetation. Being spread by birds it is found on relatively remote island and coastal areas (such as in Bass Strait for example).

It is widespread through inland areas being, for example, an important weed across all of inland NSW. Spread of boxthorn via birds means that it often occurs under trees, poles and fences. It is generally found where annual average rainfall exceeds 200mm, but can occur along seasonal stream beds in arid environments.

6.4 Summary of impacts

African boxthorn invades native vegetation, pasture and other areas (such as unused and mining lands). Once in place, it provides habitat for pest animals like rabbits and foxes, and in areas with quality native

vegetation, it reduces habitat available to native fauna. The large thorns on boxthorn can be hazardous to native fauna such as shorebirds.

Boxthorn can create impenetrable thickets that exclude desirable vegetation (native vegetation and pasture), and impede stock movement. Parts of the boxthorn plant (fruit and leaves) are thought to be slightly poisonous to people and livestock.

African boxthorn plants have large thorns and these can – even long after the plant is dead – cause injury to people, livestock and wildlife, and even pierce tyres.

6.5 Control options

In certain situations (such as where native vegetation is in a poor state or isn't present) African boxthorn can provide habitat for native fauna. This should be taken into consideration in planning for control works. In some situations, such as with the orange-bellied parrot in Victoria and South Australia, and Australian sea lion in Western Australia, boxthorn is providing essential habitat for threatened species.

Effective control of African boxthorn requires the integration of a number of methods. Any one control method applied alone will not provide for long-term control. Control needs to be planned and to incorporate monitoring and follow-up. Following up on the seed bank and any reshoot from root stock is critical to long term control success.

6.5.1 Chemical and physical control

Chemical control of African boxthorn can be undertaken through foliar, basal bark, cut stump, or (where suitable) soil application techniques. Boxthorn grows as a dense and thorny shrub and so basal bark and cut stump techniques can be physically difficult or impossible to apply.

Where boxthorn is growing in significant infestations, physical removal and burning is the most cost effective option. Follow up treatment with herbicide and/or cultivation are essential as boxthorn readily regrow's from root stock and seed. Monitoring of the treatment site for at least several years is also essential. Revegetation with native species is recommended to help discourage re-establishment of African boxthorn, and provide habitat for native fauna.

Burning of cut/physically removed materials is recommended, particularly for dense infestations, as this allows effective follow-up to take place. Also, dead plants can still provide a roosting place for birds (such as starlings), that will whilst roosting potentially deposit new boxthorn seed.

6.5.2 Biological control

No biological control agents are currently available for African boxthorn in Australia. CSIRO are aware of at least one potential agent, a rust fungus, which is found on boxthorn in South Africa. Promoting investigation of the potential for introduction and use of biological control agents is included as an action (3.4.2) in this strategy.

6.6 Quarantine and legislation

State / Territory	Legislation	Declaration	Description
6.6.1.1.1.1.1.1	<i>Land Protection (Pest and Stock Route Management) Act 2002</i>	Declared	Declared Class 2 pest plant. Illegal to sell the plant or its seed.
New South Wales	<i>Noxious Weeds Act 1993</i>	Declared	Control Class 4 across most of the NSW land area. Not to be sold, propagated or knowingly distributed (in certain local authority areas)
Northern Territory	<i>Weeds Management Act 2001</i>	Declared	Schedule class A/C – to be eradicated if found & not to be introduced to the NT
Western Australia¹	<i>Agriculture and Related Resources Protection Act 1976</i> <i>Plant Diseases Act 1914</i> From 2013 the <i>Biosecurity and Agriculture Management Act 2007 (BAMA)</i> will be the principal legislation for the management of declared organisms in Western Australia	Not declared	Permitted entry to WA
South Australia	<i>Natural Resources Management Act 2004</i>	Declared	Declared state-wide under Category 2 of the Act. Management actions prescribed on regional basis
Victoria	<i>Catchment and Land Protection Act 1994</i>	Declared	Category C - regionally controlled in each region
Tasmania	<i>Weed Management Act 1999</i>	Declared	Zone B (containment) across most of the TAS land area
ACT	<i>Pest Plants and Animals Act 2005</i>	Declared	C2 – pest plant that must be suppressed, and C4 – prohibited pest plant (propagation and supply prohibited)

7 Appendices

7.1 Weed control contacts

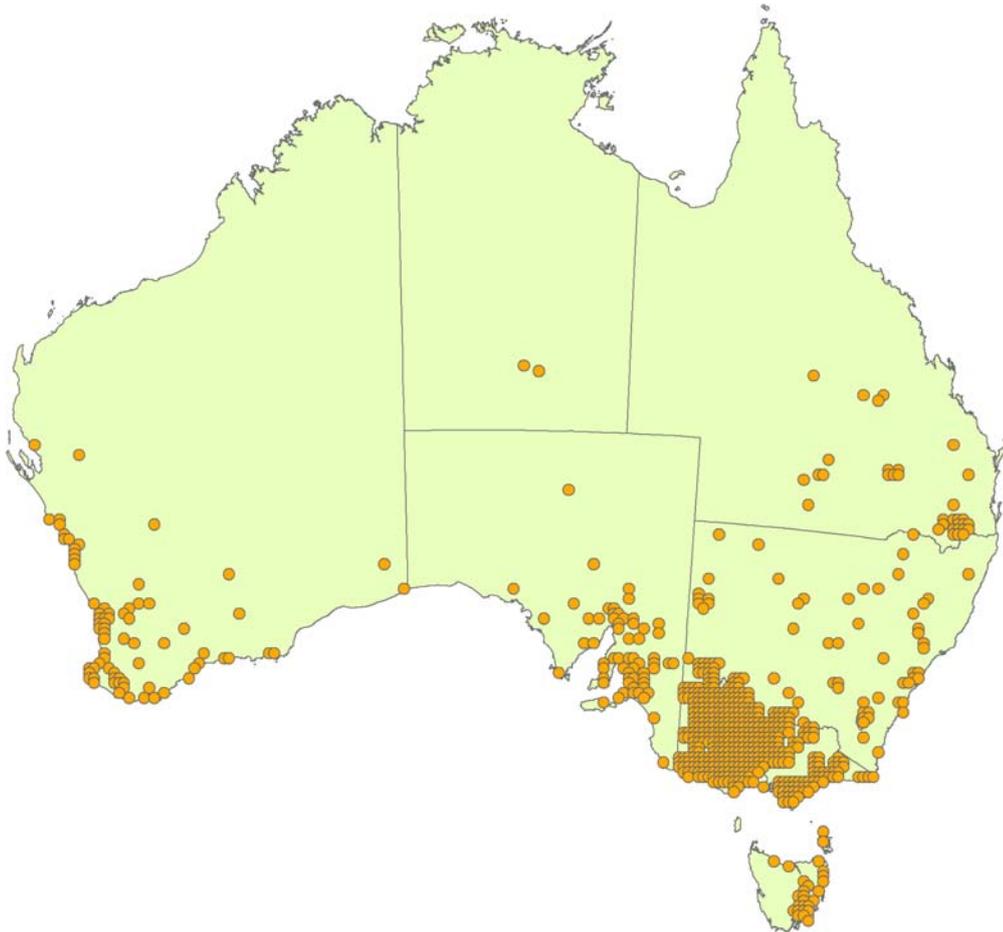
State / Territory	Department	Phone	Email	Website
ACT	Environment and Sustainable Development Directorate	132281	environment@act.gov.au	www.environment.act.gov.au/environment2
NSW	Biosecurity NSW, NSW Dept of Primary Industries	1800 680 244	weeds@industry.nsw.gov.au	www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds
NT	Dept of Natural Resources, Environment, The Arts and Sport	08 8999 4567	weedinfo.nretas@nt.gov.au	www.nt.gov.au/weeds
QLD	Biosecurity Queensland, Dept of Agriculture, Fisheries and Forestry [Queensland]	132523	callweb@dpi.qld.gov.au	www.biosecurity.qld.gov.au
SA	Biosecurity SA, Dept of Primary Industries and Regions SA	08 8303 9620	nrmbiosecurity@sa.gov.au	www.pir.sa.gov.au/biosecuritysa/nrm_biosecurity
TAS	Dept of Primary Industries, Parks, Water and Environment	1300 368 550	Go to www.dpipwe.tas.gov.au/weeds , scroll to the bottom of the page and click on "weeds enquiries"	www.dpipwe.tas.gov.au/weeds
VIC	Dept of Primary Industries	136186	customer.service@dpi.vic.gov.au	http://new.dpi.vic.gov.au/agriculture/pests-diseases-and-weeds
WA	Dept of Agriculture and Food	08 9368 3333	enquiries@agric.wa.gov.au	www.agric.wa.gov.au
National	Australian Pesticides and Veterinary Medicines Authority	02 62104701	contact@apvma.gov.au	www.apvma.gov.au

7.2 Current distribution of African boxthorn (*Lycium ferocissimum*) in Australia*

Legend - Distribution

● Present and past reported occurrence

■ No reported occurrence



*Indicative only - this map is an early effort to present national African boxthorn distribution. Gaps remain in its coverage of boxthorn presence.

7.3 Other information sources

African boxthorn is as of 2012, a Weed of National Significance. Information and resources, as they become available, will be posted at www.weeds.org.au/WoNS/africanboxthorn/.

7.4 Definitions

Asset protection – A weed management approach to reduce impact or threat on an asset

Containment - A weed management approach that aims to prevent an increase in the current distribution of a weed, by using weed control procedures to reduce the density of existing infestations and limit the dispersal of propagules. Highly effective containment programs can actually result in a decrease in the current distribution of a weed.

Coordinated control - A strategic weed management program that takes into consideration all occurrences of a weed, and involves the application of weed control procedures towards a specific end (e.g., eradication or containment).

Core infestation – weed infestation which is large and non eradicable for a defined scale

Eradication -The elimination of every single individual of a species from an area to which recolonisation is unlikely to occur, including propagules (Myers et al. 1998).

Outliers – infestation separate from core and may be eradicable

Priority outliers – feasible to eradicate or contain or reduce / prevent spread

Priority assets –high value (environmental, primary production, cultural and social) assets determined to be at risk – can be applied at varying scales, and includes defined national and jurisdictional values

Partner – Person(s) or organisation actively supporting weed management

Stakeholder – person, group or organisation interested in or concerned about weeds and or their management

7.5 Glossary

ACT – Australian Capital Territory

AQIS – Australian Quarantine Inspection Service

AWC – Australian Weeds Committee

AWS – Australian Weed Strategy

BPWW – Biodiversity Priorities for Widespread Weeds

CMA – Catchment Management Authority

CSIRO – Commonwealth Scientific and Industrial Research Organisation

MERI – Monitoring, Evaluation, Reporting and Improvement

NRM – Natural Resource Management

WoNS – Weeds of National Significance

7.6 References

Beale, R., Fairbrother, J., Inglis, A., and Trebeck, D. (2008). *One Biosecurity: a Working Partnership*. Commonwealth of Australia. Canberra.

Hobbs, RJ and Humphries, SE (1995). An integrated approach to the ecology and management of plant invasions. *Conservation Biology* 9:761–770.

7.6.1.1.1 *Kriticos, D.J., Crossman, N.D., Ota, N., and Scott, J.K. 2010. Climate change and invasive plants in South Australia. Report for the South Australian Department of Water, Land and Biodiversity Conservation. CSIRO Climate Adaptation Flagship, Canberra.*

7.6.1.1.2 *Magnussen, C. 2011 Weed Management Guide – African Boxthorn (Lycium ferocissimum). Queensland Government, Brisbane.*

7.6.1.1.3 *Muyt, A. 2001. Bush Invaders of South-East Australia. R.G. and F.J. Richardson, Victoria.*

Myers, J.H., Savoie, A., and van Randen, E. 1998. Eradication and pest management. *Annual Review of Entomology*. Vol. 43, pp. 471-91.

Parsons, W.T. and Cuthbertson, E.G. 2001. *Noxious Weeds of Australia*. CSIRO Publishing, Victoria.

7.6.1.1.4 *Richardson, F.J., Richardson, R.G. and Shepherd, R.C.H. 2007. Weeds of the South-East – an identification guide for Australia. R.G. and F.J. Richardson, Victoria.*

Victorian Department of Primary Industries (2010). *Invasive Plants and Animals Policy Framework*. State Government of Victoria, Melbourne. Accessed 21 January, 2013, www.dpi.vic.gov.au/agriculture/pests-diseases-and-weeds/protecting-victoria-pest-animals-weeds/invasive-plants-animal-policy.

Wilson, P.D., Downey, P.O., Gallagher, R.V., O'Donnell, J., Leishman, M.R. and Hughes, L. (2011) *Modelling climate suitability for exotic plants in Australia under future climate. Final Report on the potential impact of climate change on the distribution of national priority weeds in Australia*. Macquarie University and New South Wales Office of Environment and Heritage, Sydney, Australia.

Ziegler, K. And Hopkins, K. 2011. *Furneaux Islands - Boxthorn Control*. Friends of Bass Strait Islands – Wildcare. Tasmania.