NOOSA COUNCIL

Noosa Biosecurity Plan 2020

Feral pig Sus scrofa
Photo: Queensland Department of Agriculture and Fisheries

Document Set ID: 21092531
Version: 2, Version Date: 24/02/2020

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Endorsed by Noosa Council 20 February 2020

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1. Executive Summary

Biosecurity is defined as efforts to prevent, respond to, and recover from, pests and diseases that threaten the economy and the environment. Under the *Biosecurity Act 2014* all public and private landowners have a general biosecurity obligation to control invasive plants and animals on their land. The Act also requires local governments to have a Biosecurity Plan for their local government area. Reducing the threat of biosecurity risks is a key action under the Noosa Environment Strategy 2019.

Invasive animals and plants can be a threat to biodiversity, agriculture and human health. Prevention and eradication at early stages can save a significant amount of financial resources in the long term. The purpose of the Plan is to identify priority actions for local government, other government agencies and private landowners on biosecurity matters within Noosa Shire.

It is also acknowledged that some introduced plants are now naturalised and perform an ecosystem function stabilising soil, providing habitat for fauna and absorbing nutrients in wetland areas. Extreme control measures without natural regenerative approaches can cause environmental harm. This Plan takes a risk management approach with pest plants and animals and prioritises geographic areas for targeted inspections and management actions.

Water Hyacinth (Eichhornia crassipes)
Photo: Queensland Department of Agriculture and Fisheries

2. Introduction and purpose

Noosa has an extensive vegetation network with a diverse representation of ecosystems, fauna and flora, and habitat. Protected areas make up a third of the shire and a significant amount of vegetation and habitat exist on private land. Along with development and climate change, invasive animals and plants are a significant threat to Noosa's biodiversity values. The livelihood of landowners can also be impacted by pest species. Wild dogs predate on stock and weeds can infest pasture and reduce productivity. The Noosa Biosecurity Plan aims to avoid and mitigate these threats, recognising that taking a risk management approach and prioritising actions in a practical and logical way, is the way forward to achieve the best outcomes for public and private landowners.

The purpose of the Plan is to guide actions for local government and landowners concerning biosecurity risks in relation to invasive plants and animals. Under the *Biosecurity Act 2014*, public and private landowners have a general obligation to take reasonable and practical steps to minimise biosecurity matters that may present a risk to people, industry and/or the environment. This is consistent with the *Noosa Environment Strategy*, which has targets for retaining ecosystem values and promoting sustainable agricultural practices.

3. Background and Context

3.1 Description of Noosa Shire

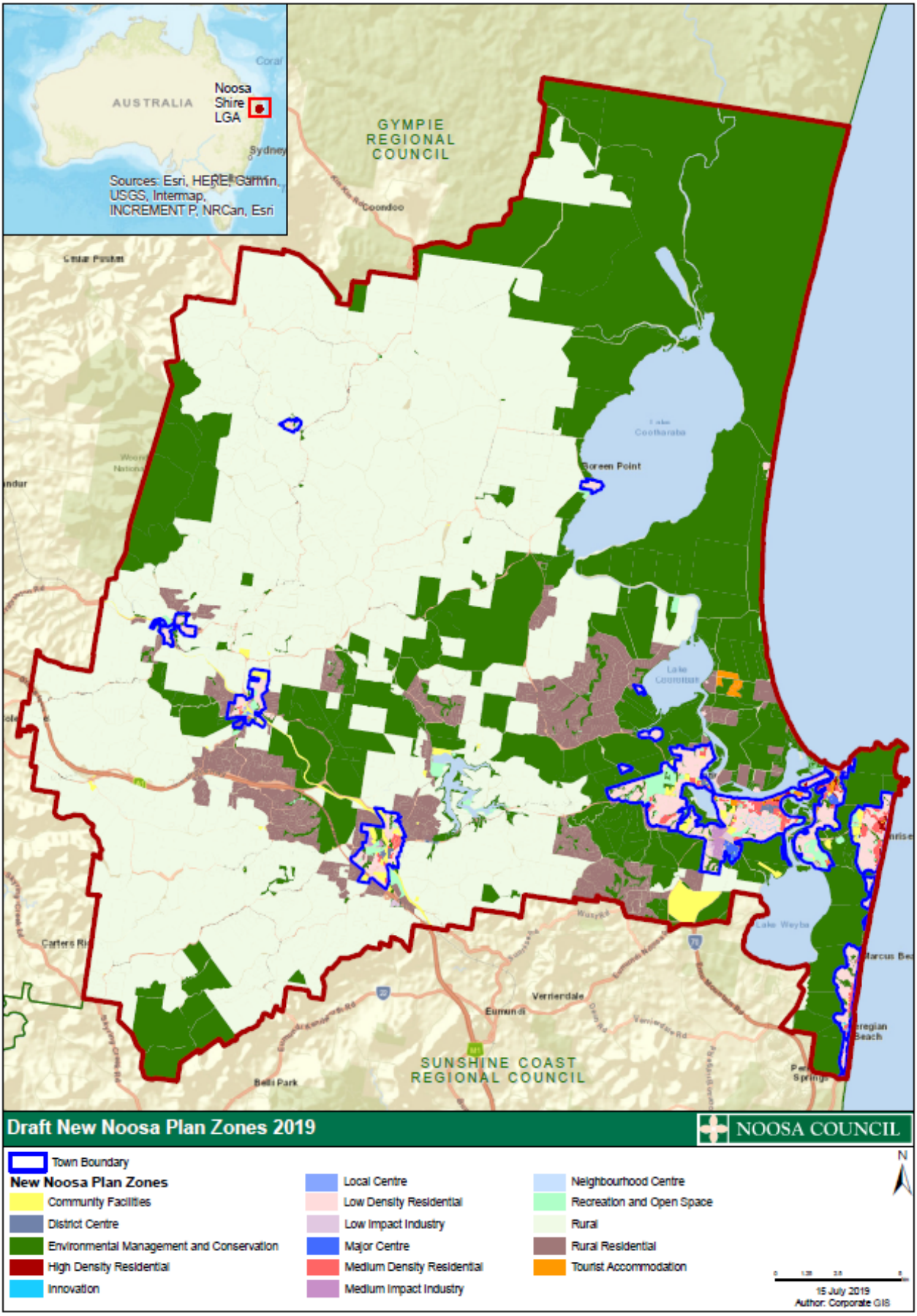
Geological history and a sub-tropical climate has shaped Noosa's landscape and ecosystems. The original inhabitants, the Kabi Kabi people, had a close affinity with their environment and were influential in shaping vegetation and habitat, particularly through the use of fire, over many thousands of years.

With European settlement in the late 1800s non-native plant and animal species were introduced into the area, impacting on vegetation, flora and fauna. As settlement expanded so did the extent of invasive species such as cats, dogs, pigs, ornamental plants and agricultural weeds. Other species were accidently released which also threatened the environment and agricultural productivity. Today, the release of invasive plants and animal species is still a risk and authorities are working hard to minimise these threats through border controls and regulation through the *Biosecurity Act 2014*.

Some invasive species are now naturalised and are unlikely to ever be eradicated from Noosa Shire. They may now perform an ecosystem function, for example, erosion control, habitat for native species, or sequestration of nutrients from waterways. The role of the Noosa Biosecurity Plan is to prioritise which species are a focus for management and identify actions that can be implemented in a practical and cost effective way.

Broad-leaved pepper tree (Schinus terebinthifolius),

Photo: Queensland Department of Agriculture and Fisheries



Map 1: Management of invasive biosecurity matters apply to all public and private landowners across the Shire

3.2 Why do we need a Biosecurity Plan?

There are approximately 8.7million plant and animal species in the world and some of these represent a biosecurity risk to Australia and Noosa. Plants and animals have been colonising Australia from other parts of the world for thousands of years and recent occupation, settlement and development have dramatically increased the abundance and diversity of introduced species.

Since European settlement several thousand plant and animal species have been introduced into Australia. Many of these species are now well established and unlikely to be eradicated. Introduced species can significantly impact on biodiversity, economies and community health. Alternatively some introduced species can fulfil an ecosystem function, absorbing nutrients, protecting soil from erosion and providing habitat for fauna.

Council has shire-wide jurisdiction concerning biosecurity matters but under the *Biosecurity Act 2014* all landowners are responsible for biosecurity matters on their land. The Noosa Biosecurity Plan 2020 identifies priority invasive plants and animals that can be a problem in Noosa Shire and management actions for landowners that are practical and feasible. Importantly consultation, raising awareness and collaboration with key stakeholders and the Noosa community helps build capacity to manage biosecurity matters across the shire.

3.3 What are invasive biosecurity matters?

The *Qld Biosecurity Act 2014* identifies invasive species that are a threat to biodiversity, the economy and the community. There are generally two types of biosecurity matters relevant to local government jurisdiction:

- **Schedule 1 Prohibited matters:** Invasive species that are a potential threat, however most have not yet been recorded in Queensland. One of these species has been recorded in Noosa Shire.
- **Schedule 2 Restricted matters:** Invasive species that are already a threat in Queensland. 43 species have been recorded in Noosa Shire so far.

For prohibited and restricted matter there are 7 different categories of management controls depending on the listed species concerned. Biosecurity Queensland and Noosa Council have certain jurisdiction with invasive plants and animals as shown in Table 1.

Red deer (Cervus elaphus) Photo: Queensland DAF

Management categories for Schedule 1 & 2 listed species	Biosecurity obligation	Biosecurity Queensland role	Noosa Council role
1	Must be reported to BQ within 24hrs	Regulatory Contain and eradicate	Refer to BQ
2	Must be reported to BQ or LGA within 24hrs	Regulatory Reduce, control or contain	Regulatory Inform BQ Reduce, control or contain
3	Cannot be supplied to another person or released into the environment	Regulatory	Regulatory
4	Cannot be moved so as to avoid spreading	Regulatory	Regulatory
5	No possession allowed	Regulatory	Regulatory
6	Feeding not allowed unless undertaking a control program	Regulatory	Regulatory
7	Must be destroyed if in possession	Regulatory	Refer to BQ

Table 1: Management categories for Schedule 1 & 2 invasive biosecurity matters. Council's regulatory role applies to management categories 2, 3, 4, 5 & 6

For local government jurisdiction there are 160 species alone identified in Schedule 2 of the *Biosecurity Act 2014* defined as 'restricted matter'. In addition there are a large number of non-scheduled invasive species that may be voluntarily managed by landowners. An invasive species list is provided in Appendix 1 of this document.

3.4 Regulation

Queensland Biosecurity and Local Government Officers have powers under the *Biosecurity Act 2014* to regulate biosecurity matters. In addition Council officers have powers under the *Local Government Act 2009*. In the majority of situations Council officers are able to negotiate acceptable solutions for landholders that have an obligation to manage biosecurity matters. Under certain circumstances officers may take the following actions:

- Enter land to inspect biosecurity matters.
- Issue and enforce a biosecurity order.
- Control a biosecurity matter and recover costs.

3.5 Plan objectives

The development of the Noosa Biosecurity Plan 2020 is a requirement of the *Biosecurity Act 2014* and is necessary to achieve the biodiversity and sustainable living outcomes of the *Noosa Environment Strategy*. This plan supersedes the *Noosa LGA Pest Management Plan 2015-2019*.

The *Noosa Environment Strategy* has a specific identified outcome that;

- *Invasive pest species are managed strategically to reduce impacts on native species and habitats, as well as recreation and tourism values.*

This Plan's objective is to achieve that outcome through management of invasive plant and animal biosecurity risks to people, biodiversity, and the local economy, based on priorities and actions that are reasonable and practical for all landowners.

3.6 Scope

The Plan applies to the Noosa local government area covering all public and private land. With respect to public land the Plan applies to Queensland Government land such as National Park and Council-controlled land including bushland reserves, parks and gardens and road reserves. With regard to private land, Council plays an advocacy role in supporting landowners to identify and manage biosecurity risks on their land. In some cases Council will collaborate with private landowners to implement actions to manage priority biosecurity risks, such as feral animal control.

Council plays a role in reporting biosecurity matters to Biosecurity Queensland. Under the *Biosecurity Act 2014* Council is responsible for regulating *Schedule 2 Invasive Biosecurity Matter - Restricted plants and animals* (see Appendix 1).

The Plan does not consider fauna species protected under the *Nature Conservation Act 1992* that may be a nuisance to some residents. Examples include flying-foxes, magpies, brush turkeys and snakes. This Plan does not consider domestic or public health risks such as vermin, mosquitoes, biting midges or cockroaches or pathogens of humans, domestic animals, livestock or plants.

3.7 Stakeholders

Stakeholders include Queensland Government agencies such as the Queensland Parks & Wildlife Service, Department of Natural Resources, Mines and Energy, Queensland Rail and the Department of Transport and Main Roads. Adjoining local government authorities are also key stakeholders in managing invasive species. Non-government stakeholders include private landowners, catchment management associations, Landcare and local environment groups.

Council has a close working relationship with bushland care volunteers and private landowners involved with the Land for Wildlife and Voluntary Conservation Agreement programs, also key stakeholders. Council's private land conservation program provides an opportunity to engage with an extensive network of landowners across the extent of Noosa Shire, on biosecurity matters.

The Biosecurity Plan guides Council's activities with biosecurity matters on Council-controlled land. Council may notify and work with private landowners and other government agencies to manage biosecurity matters on their land.

4. Management approach

The most cost effective approach is to prevent invasive species from establishing within the shire. If invasive species are not detected early and eradicated, then costly long term management is required.

Biosecurity Queensland, Noosa Council and landowners have been successful in eradicating several potentially invasive species from the shire. For example Water mimosa (*Neptunia oleracea*), *Senegalia* spp., Madras thorn (*Pithecellobium dulce*) and Parthenium (*Parthenium hysterophorus*) were reported to Council by landowners and were eradicated through herbicide treatment and mechanical removal. Without early detection, reporting and timely eradication, there would have been potentially significant impacts for landowners and costly ongoing management.

4.1 Reporting and management response

Reports of invasive species are provided through Council surveillance programs or from members of the public. The response from Council to landowners will depend on the species concerned and whether they are a scheduled species under the *Biosecurity Act 2014* (see Figure 1 below).

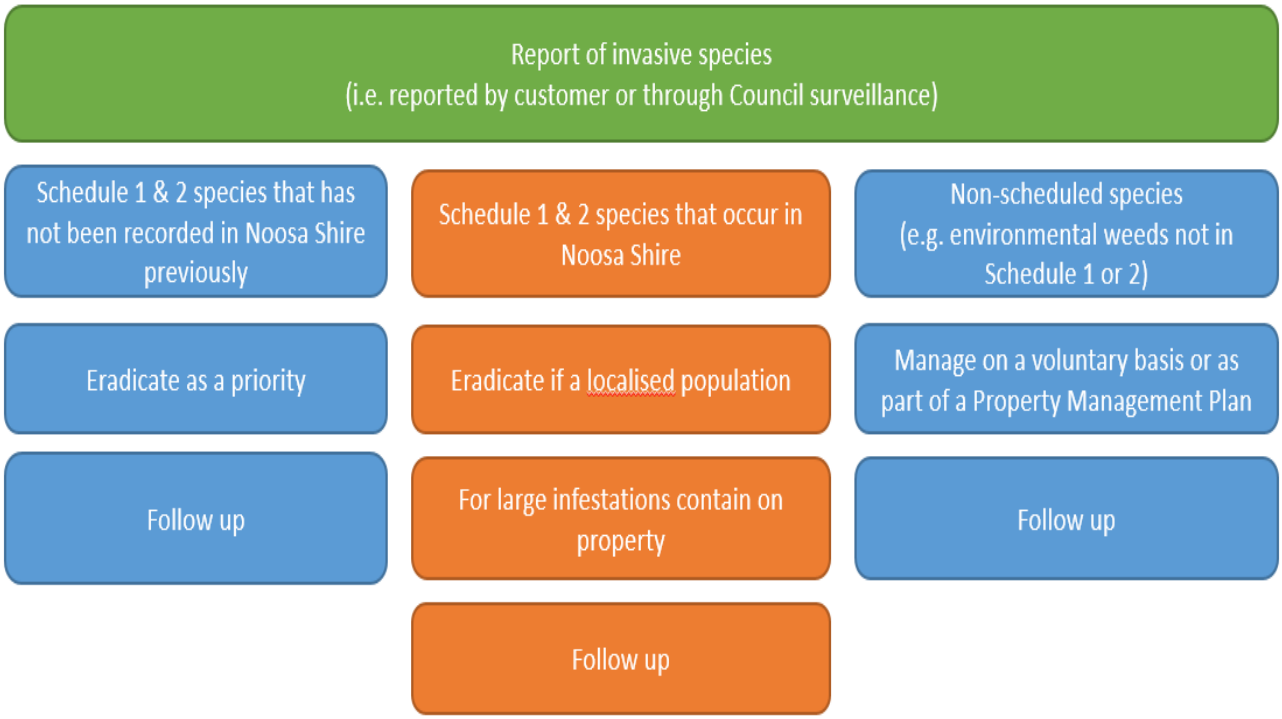


Figure 1: Decision tool for incoming reports of invasive species

4.2 Shire wide priorities for Schedule 1 & 2 invasive species

To guide Council's prioritised management of scheduled species an expert panel has assessed the risk and management feasibility of Schedule 1 & 2 invasive species that have been recorded in Noosa Shire previously. Note that all public and private landowners within Noosa Shire have a biosecurity obligation for all Schedule 1 & 2 invasive matters regardless of the prioritisation score.

The risk assessment was based on invasive species current extent, risk to biodiversity, economy and people. The feasibility of control was also considered, with all Schedule 2 species given a priority score. The prioritisation methodology considered;

- Likelihood of establishment (scored between 1 and 5, where 5 was the highest likelihood)
- Ecological impact (scored between 1 and 5, where 5 was the highest impact)
- Economic impact (scored between 1 and 5, where 5 was the highest impact)
- Community impact (scored between 1 and 5, where 5 was the highest impact)
- Feasibility of management actions (scored between 1 and 10, where 10 was the highest likelihood of success)

The invasive species, with their prioritisation score, are further categorised into priority management responses of **prevention**, **eradication** or **containment**. This is depicted in the generalised invasion curve below. Note that actual on-ground actions for landowners will depend on the extent of infestation.

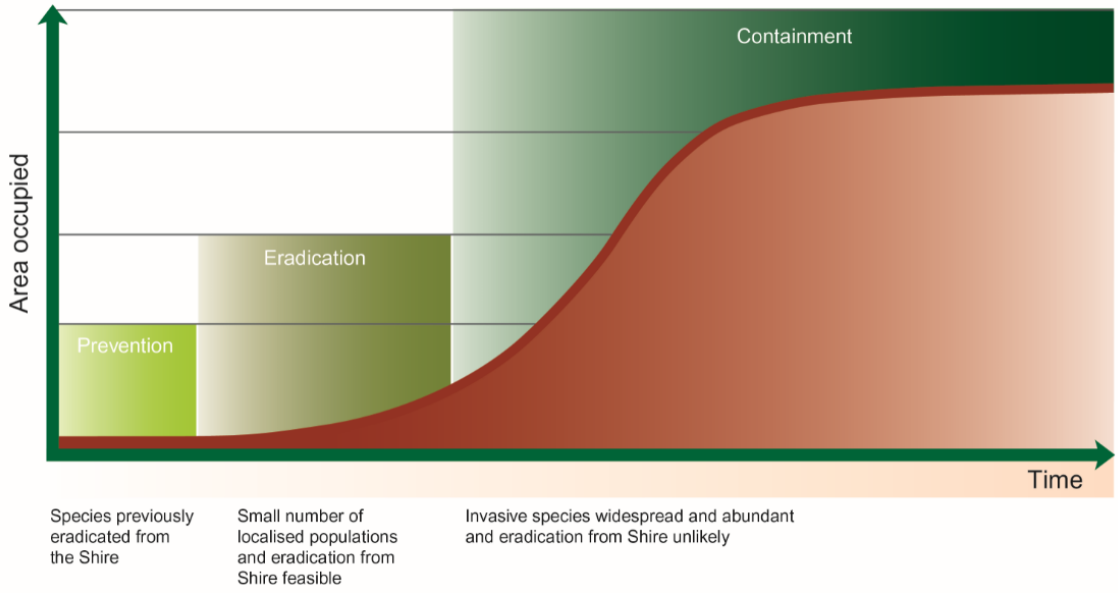


Figure 2: Generalised invasion curve

'Prevention' is the highest priority followed by 'eradication' and 'containment'. Investment priorities will mirror the results of the risk assessment. In most circumstances, Priority 1 species will require little investment, but if they do show up in Noosa immediate resources will need to be allocated.

This plan also prioritises targeting biosecurity threats that have the best chance of being eradicated (*Priority 2: Eradication* list) completely from Noosa. The Priority lists enables extra resources to be targeted towards the next highest risk species – the more the investment, the more effective eradication and containment will be, and the further down the list management actions will be undertaken. It is hoped that improvements in technologies and techniques, along with active management, may see some of the *Priority 3: Containment* threats able to move to potentially eradicable in the future, or at least to achieve local eradications.

Results of the risk assessment and management feasibility assessment are shown in the table below:

Priority 1: Prevention **Outcome: New invasive species are prevented from entering the shire** Note: The species below were previously eradicated from shire and are a high priority for monitoring. Any new invasive species that enter Noosa Shire are added to this list	**Management category**	**Priority Score**
Water mimosa (*Neptunia oleracea* and *N. plena*)	2,3,4,5	27
Madras thorn (*Pithecellobium dulce*)	2,3,4,5	23
Acacia (*Senegalia* spp.) (Schedule 1)	1	23
Parthenium (*Parthenium hysterophorus*)	3	22
Mexican bean tree (*Cecropia pachystachya*, *C. palmata* and *C. peltata*)	2,3,4,5	22
Priority 2: Eradication **Outcome: Invasive species currently present in the shire are eradicated** Note: The species below could feasibly be eradicated from the shire with sufficient resourcing	**Management category**	**Priority Score**
African fountain grass (*Cenchrus setaceum*)	3	22
Annual ragweed (*Ambrosia artemisiifolia*)	3	22
Bitou bush (*Chrysanthemoides monilifera* ssp. *rotundifolia*)	2,3,4,5	22
Chinee apple (*Ziziphus mauritiana*)	3	22
Fireweed (*Senecio madagascariensis*)	3	21
Kahili ginger (*Hedychium gardnerianum*)	3	21
Yellow oleander, Captain Cook tree (*Cascabela thevetia* syn. *Thevetia peruviana*)	3	21
Creeping lantana (*Lantana montevidensis*)	3	20
Common pest pear, spiny pest pear (*Opuntia stricta* syn. *O. inermis*)	3	17
Drooping tree pear (*O. monocantha* syn. *O. vulgaris*)	3	17
Priority 3: Containment **Outcome: Invasive species are contained within property boundaries** Note: Eradication of these species from the shire is unlikely. For small infestations or infestations that can be eradicated within 5 years, eradication is more cost effective for landowners than ongoing containment.	**Management category**	**Priority Score**
Plants		
Dutchman's pipe (*Aristolochia* spp. other than native species)	3	23
African tulip tree (*Spathodea campanulata*)	3	22
Thunbergia (*Thunbergia grandiflora* syn. *T. laurifolia*)	3	22
Salvinia (*Salvinia molesta*)	3	22
Broad-leaf privet, tree privet (*Ligustrum lucidum*)	3	21

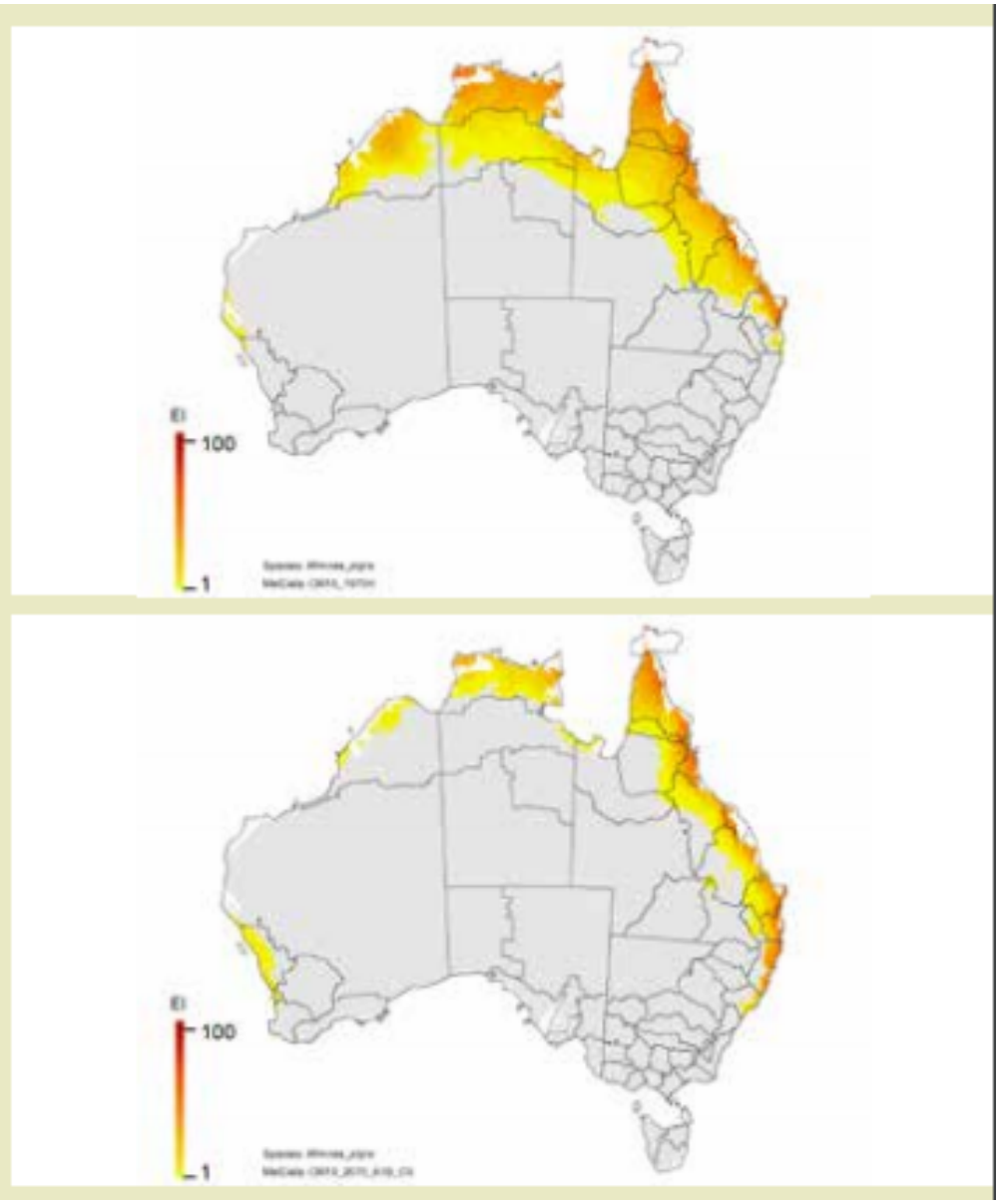
Broad-leaved pepper tree (*Schinus terebinthifolius*)	3	21
Cabomba (*Cabomba caroliniana*)	3	20
Yellow bells (*Tecoma stans*)	3	20
Cat's claw creeper (*Dolichandra unguis-cati*)	3	19
Singapore daisy (*Sphagneticola trilobata* syn. *Wedelia trilobata*)	3	17
Madeira vine (*Anredera cordifolia*)	3	17
Groundsel bush (*Baccharis halimifolia*)	3	17
Lantana, common lantana (*Lantana camara*)	3	17
Asparagus fern (*Asparagus aethiopicus, A. africanus* and *A. plumosus*)	3	17
Camphor laurel (*Cinnamomum camphora*)	3	16
Balloon vine (*Cardiospermum grandiflorum*)	3	16
Small-leaf privet, Chinese privet (*Ligustrum sinense*)	3	15
Mother of millions hybrid (*Bryophyllum x houghtonii*)	3	15
Chinese celtis (*Celtis sinensis*)	3	15
American rat's tail grass (*Sporobolus jacquemontii*)	3	15
Giant Parramatta grass (*S. fertilis*)	3	15
Giant rat's tail grass (*S. pyramidalis* and S. *natalensis*)	3	15
Priority 3: Containment **Outcome: Feral animal populations are reduced to a manageable level.** Note: Eradication of these species from the shire is unlikely.	**Management category**	**Priority Score**
Animals		
Feral red deer (*Cervus elaphus*)	3,4,6	24
Dingo (*Canis lupus dingo*)	3,4,5,6	20
Dog (*Canis lupus familiaris*), other than a domestic dog	3,4,6	20
European fox (*Vulpes vulpes*)	3,4,5,6	19
Cat (*Felis catus* and *Prionailurus bengalensis x Felis catus*), other than a domestic cat	3,4,6	19
Feral pig (*Sus scrofa*)	3,4,6	18

Table 2: Shire wide priorities for management of Schedule 1 & 2 invasive species that have been recorded in Noosa Shire. Note that all public and private landowners have a biosecurity obligation to manage all scheduled invasive species regardless of the prioritisation score.

4.3 Climate change

Climate change is predicted to make significant changes to ecosystems, vegetation and habitat over time. Although it is likely there will be some 'winners and losers' as a consequence of climate change, the response of pest species is still a developing science. AdaptNRM provides tools and resources to help manage weeds under a changing climate https://adaptnrm.csiro.au/

CLIMEX modelling is used to assess the suitability of regions for certain weed species under a future climate. This predictive tool allows land owners to adapt their management priorities in response to climate change.



Map 2. CLIMEX modelling of Mimosa pigra, an invasive species. The map at the top is the current situation. The lower figure is a 2070 projection showing a decline in risk in northern Australia and an increased risk in southern Qld.

Source: Waldon.,D., et al., in AdaptNRM, Supporting Weed Management Adaptation.

Invasive species will respond in different ways under climate change pressure. A landowner's adaptive response will depend on the nature of the climate change impact and the species concerned.

Climate change pressure	Impact	Invasive species response	Adaptation response
Ecological			
Increased temperature	Loss of biodiversity through more frequent and severe wildfires	Certain fire dependant invasive species can dominate native species after fire. Tropical weed species expected to expand their range to SEQ	Fire dependant invasive species are rated as a high priority for management within the prioritisation table. Ecosystems that are susceptible to the impacts of wildfire, such as rainforest, are managed as fire exclusion areas.
More severe flood events	Erosion of riparian areas	Greater opportunity for invasive species to invade areas impacted by erosion	Riparian buffer areas are restored on a priority basis
Sea level rise	Salt water inundation	Encourages salt tolerant species	Allow space for ecosystem transitional movement through planning scheme protections and environment levy land purchases
More severe storm events	Storm damage to vegetation	Reduced canopy cover provides greater opportunity for invasive species to invade understory	Assess through Bio-condition Assessments and remediate based on priorities identified in the Biodiversity Assessment Report 2016
Prolonged drought	Loss of biodiversity Changes to groundwater hydrology. Alteration of flowering patterns	Drought tolerant invasive species outcompete native species	Drought tolerant invasive species are rated as a high priority for management within the prioritisation table
Economic			
Increased temperature	Reduced crop yield	More favourable conditions for some invasive species to invade crop and pasture areas	Landowners are encouraged to manage invasive species that respond to temperature extremes
More severe flood events	Soil erosion and saturation	Weed species invade disturbed areas	Landowners are encouraged to minimise soil erosion through land management practices
Prolonged drought	Soil exposure Potential overgrazing	Greater opportunity for some weed species to dominate	Landowners are encouraged to apply soil conservation practices.
Community			
Increased temperature and dry conditions	Potential health issues such as asthma	Conditions may favour asthma causing invasive species	Asthma causing invasive species are a high priority within the prioritisation table

Table 3. Climate change pressures and adaptive management responses

5. Management methods

The method of management will depend on whether the purpose of invasive species control is to prevent/mitigate threats to biodiversity, local economies or human health and also the extent of the infestation.

5.1 Invasive plants

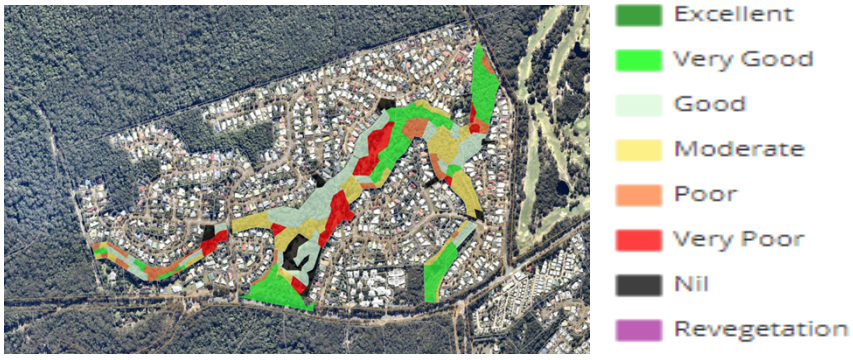
5.1.1 Property pest management plans

A property pest management plan can assist landowners where the extent of invasive species requires management over several years. The nature of the property pest management plan will depend on the desired outcomes, whether that be improving agricultural productivity or requiring ecological restoration. Private landowners may develop a property management plan as a requirement under the *Biosecurity Act 2014*, or voluntarily through a Land for Wildlife or Voluntary Conservation Agreement program, where ecological restoration is the main objective.

Case study: Bushland Operational Assessments (BOAs)

Council uses a Bushland Operational Assessment (BOA) methodology to assess the condition of its bushland reserves. Essentially a BOA spatially identifies the resilience of native vegetation against various threats such as weeds, fire, disturbance and nutrients and its recovery potential. Condition classes range from 'Excellent resilience' where full recovery is expected after natural disturbance to 'Nil resilience' where significant reconstruction is required to bring the site back to a natural condition. The BOAs are reviewed every 5 years to assess how the condition of the bushland reserve has changed over time.

Figure 3. A BOA demonstrates how vegetation condition has changed over time through ecological restoration works



2010

2016

5.1.2 Management techniques

Public and private landowners use various methods of control of invasive species, often together to take an integrated approach to management. Council is guided by industry best practice and will continue to explore management alternatives that are safe, cost effective and practical. Each method of invasive plant control can have advantages and disadvantages as tabled below.

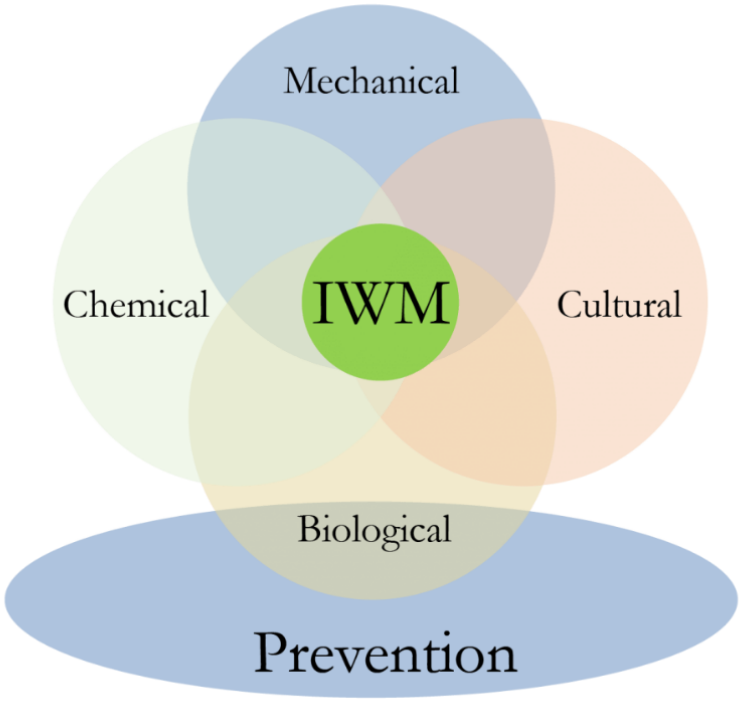


Figure 4: Integrated weed management (IWM) (Source: Annie Klodd in IWM)

Method	Advantages	Disadvantages	Examples
Mechanical	Targeted, immediate results.	Can be labour intensive unless using machinery, and impact off target species. Still may require follow up with other methods.	Groundsel at young growth stage. Steaming of weeds along pathways.
Chemical	High level of effectiveness, reduces other disturbance, and can be targeted	Concerns from some sectors of the community over potential health effects.	Glyphosate and Metsulfuron to control weeds
Biological	Once established, self-sustainable	Expensive, requires years of research, potential impacts to non-target species.	Biological control of Lantana and Salvinia
Cultural	Can be cost effective	Can be labour intensive and high risk if not well managed (e.g. fire management).	To minimise spread avoid slashing Giant Rat Tail grass prior to seeding. Fire management.

Table 4: Advantages and disadvantages of various weed control methods

The options for management of invasive plants is changing all the time with new products and technologies coming onto the market, with the aim of addressing shortcomings of existing techniques, and tackling emerging threats. Council has, and will continue to, trial new technologies as they become available, assessing them for efficacy, safety, cost effectiveness, and potential off-target impact.

5.1.3 Timing

To maximise management effectiveness different invasive species are controlled at different times. For example certain plant species may best be controlled during growth stages or prior to flowering. Table 5 below depicts the seasonal nature of managing invasive plant species.

Annual Planning Calender for Pest Plant Programs

Program	January	February	March	April	May	June	July	August	September	October	November	December
Groundsel												
Fireweed												
Giant Rat's Tail												
Annual Ragweed												
Lantana												
Singapore Daisy												
Salvinia												
Broad leaved pepper												
Yellow Bells												
Chinese celtis												
Small leaved privet												
Mother of millions												
Cat's Claw creeper												
Madiera Vine												
Camphor laurel												
Hygrophila												
Sagittaria												
Thunbergia laurifolia												
Bitou Bush												
Cabomba												

Activity type
Spraying
Cut & paint/ frill
Manual removal
Cut & paint & spraying

Table 5: Council calendar showing timing and techniques for some invasive plant species

Leucaena leucocephala is a fodder tree that has the potential to invade bushland in Noosa Shire. Although not a scheduled species under the Biosecurity Act 2014 landowners are encouraged to remove new incursions from their land. Photo: Qld DAF

5.2 Invasive animals

5.2.1 Management techniques

Invasive animals can be highly mobile, seeking out territories and searching for food and prey. As for invasive plant controls, different techniques are used to control invasive animals depending on the scale and location of the issue. These will often be used together in an integrated approach, as rarely will one method alone be successful in reducing the biosecurity risk. Council is guided by industry best practice and will continue to explore management alternatives that are safe, cost effective and practical. Methods are summarised in the table below.

Method	Advantages	Disadvantages	Examples
Trapping	Targeted control	Labour intensive, small targeted areas only, ineffective for some species	Pig trapping
Baiting	Targeted control, through choice and placement of baits Cost effective	Concerns from some sectors of the community regarding distress to feral animal and risk to non-target species	Wild dog, pig and fox control
Shooting	Targeted control	Only where safe in rural areas, not practical for some species	Wild deer control
Canid Pest Ejectors (CPEs)	Targeted control	Concerns from some sectors of the community regarding distress to feral animal	Wild dog, foxes
Den fumigation	Targeted control	Labour intensive	Foxes
Fencing	Complete exclusion	Expensive to build and maintain. Some species damage or can climb (foxes) Shifts the problem elsewhere	All feral species
Guardian dogs, alpacas, llamas and donkeys	Doesn't require the use of poisons or firearms	Can be expensive to train, purchase and maintain Doesn't reduce feral animal numbers and shifts the problem elsewhere	Wild dogs

Table 6: Advantages and disadvantages of various pest animal control methods

New management options for feral animals are constantly emerging with new products, techniques and technologies coming onto the market, with the aim of tackling emerging threats. Council has, and will continue to trial new technologies as they become available, assessing them for efficacy, safety, cost effectiveness, and potential off-target impact.

Case study: Common Myna (*Acridotheres tristis*)

The Common Myna was originally introduced to Australia from Asia to control agricultural pests. The Common Myna is now widespread and is often seen in urban areas around Noosa. There is concern that they outcompete native animals for food and nesting hollows.
Although the Myna is not a scheduled species under the *Biosecurity Act 2014*, Council has been helping volunteers to reduce populations through a community trapping program.

Photo: DAF

5.2.2 Timing of management actions

To maximise management effectiveness, pest animal control is undertaken subject to movement, breeding and feeding patterns. For example foxes are controlled prior to turtle nesting. Table 7 below depicts the seasonal nature of invasive animal species management.

Annual Planning Calender for Pest Animal Programs

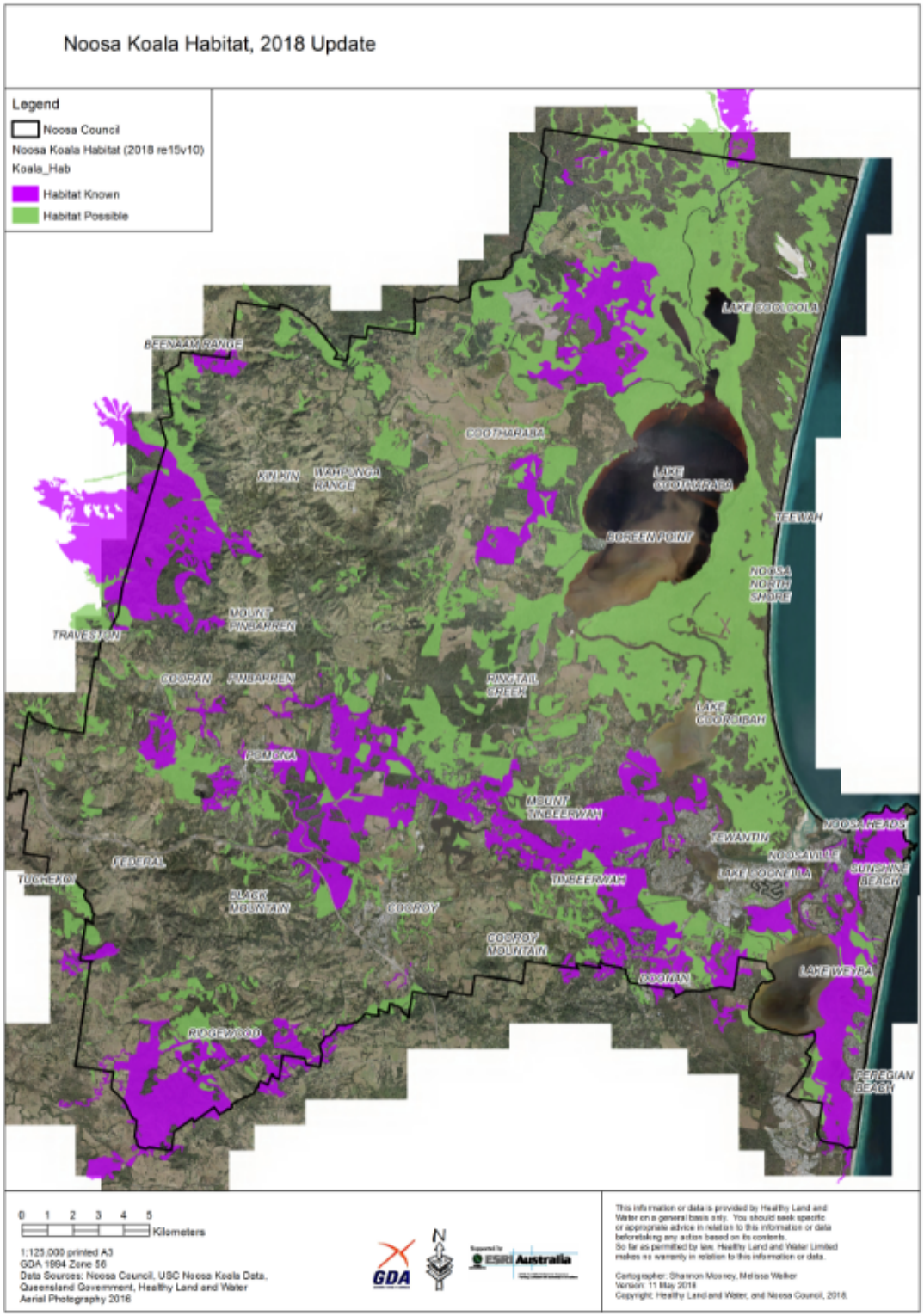
Program	January	February	March	April	May	June	July	August	September	October	November	December
Wild dog												
Fox												
Feral Deer												
Feral Pig												
Feral Cat												

	Activity type
	Trapping
	Baiting
	Shooting
	Canid Pest Ejectors (CPE's)
	Den Fumigation
	Baiting & Den fumigation
	Trapping & CPE's

Table 7: Council calendar for invasive animal species management

Case study

Research has shown that wild dogs use bushland as a refuge and can significantly impact on koala populations. Council and the University of Sunshine Coast have developed a proposal to expand wild dog control efforts towards key koala habitat areas. This will not only help landowners but also provide further protection to local koala populations.



Map 3: Noosa Koala Habitat Map

5.2.3 Code of Practice

Biosecurity management actions are guided by the following Codes of Practice, guidelines and operating procedures

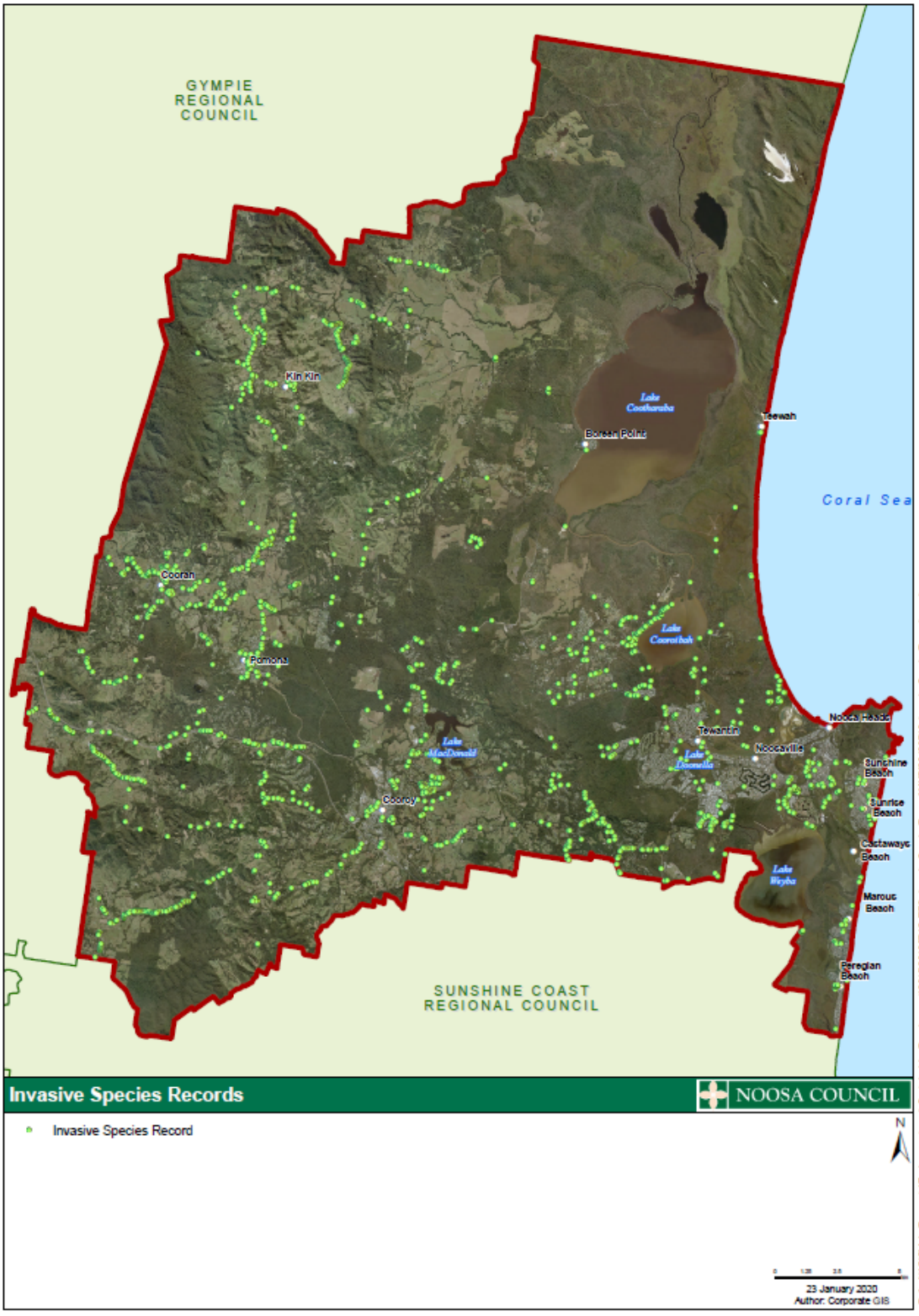
Organisation	Website	Resources
Australian Pesticides and Veterinary Medicines Authority (APVMA)	https://apvma.gov.au	Use of herbicides
PestSmart	http://www.pestsmart.org.au/animal-welfare/humane-codes/	Standard operating procedures for humane control of pest animals
Australian Government	https://www.nhmrc.gov.au/about-us/publications/australian-code-care-and-use-animals-scientific-purposes	Australian code for the care and use of animals for scientific purposes
Safe Work Australia	https://www.safeworkaustralia.gov.au/sds	Material Safety data Sheets
DAF invasive species fact sheets and manuals	https://www.daf.qld.gov.au/business-priorities/biosecurity	Fact sheets on invasive species control
Australian Government	https://www.environment.gov.au/biodiversity/invasive/weeds/management/index.html	Management of Weeds of National significance (WONS)

Table 8: Biosecurity Code of Practice, guidelines, fact sheets and operating procedure

6. Information systems

6.1 Historic data and information

To better understand the distribution an abundance of invasive species across the shire, previous pest survey data has been loaded onto a spatial mapping layer (Map 4). This provides a visualisation of invasive species presence across the shire and helps identify areas that require follow up management actions for staff.



Map 4: shows invasive species records previously collected across the shire.

6.2 Surveys

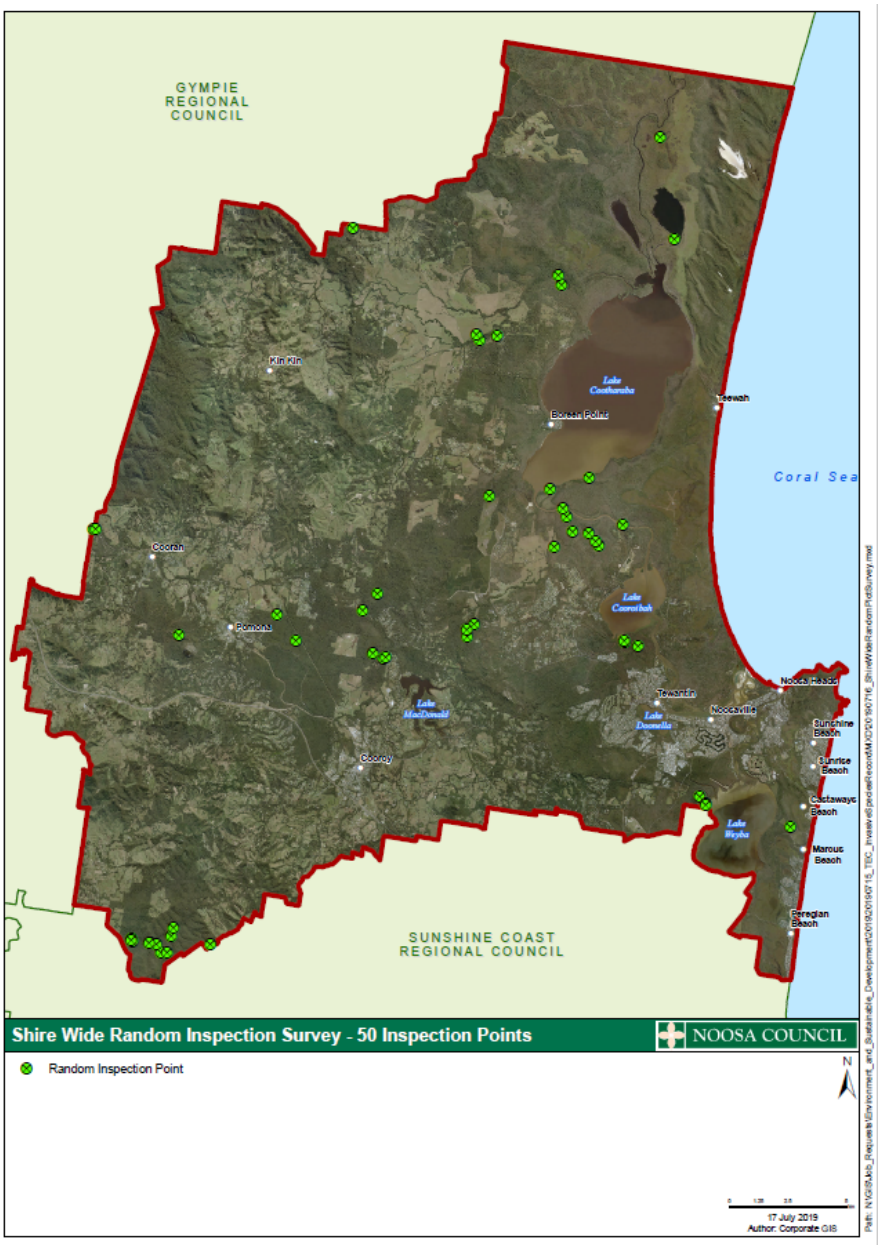
Council Pest Management Officers undertake inspections on urban and rural properties as part of an ongoing program of biosecurity surveillance. These surveys are discussed below:

6.2.1 Pest survey program

The *Biosecurity Act 2014* gives authority for Pest Management Officers to survey private property and government land for invasive species. Each quarter, four localities in rural areas are selected for surveys. Repeat visits allow for an assessment of the effectiveness of implementation actions to reduce biosecurity threats.

6.2.2 Shire-wide surveys

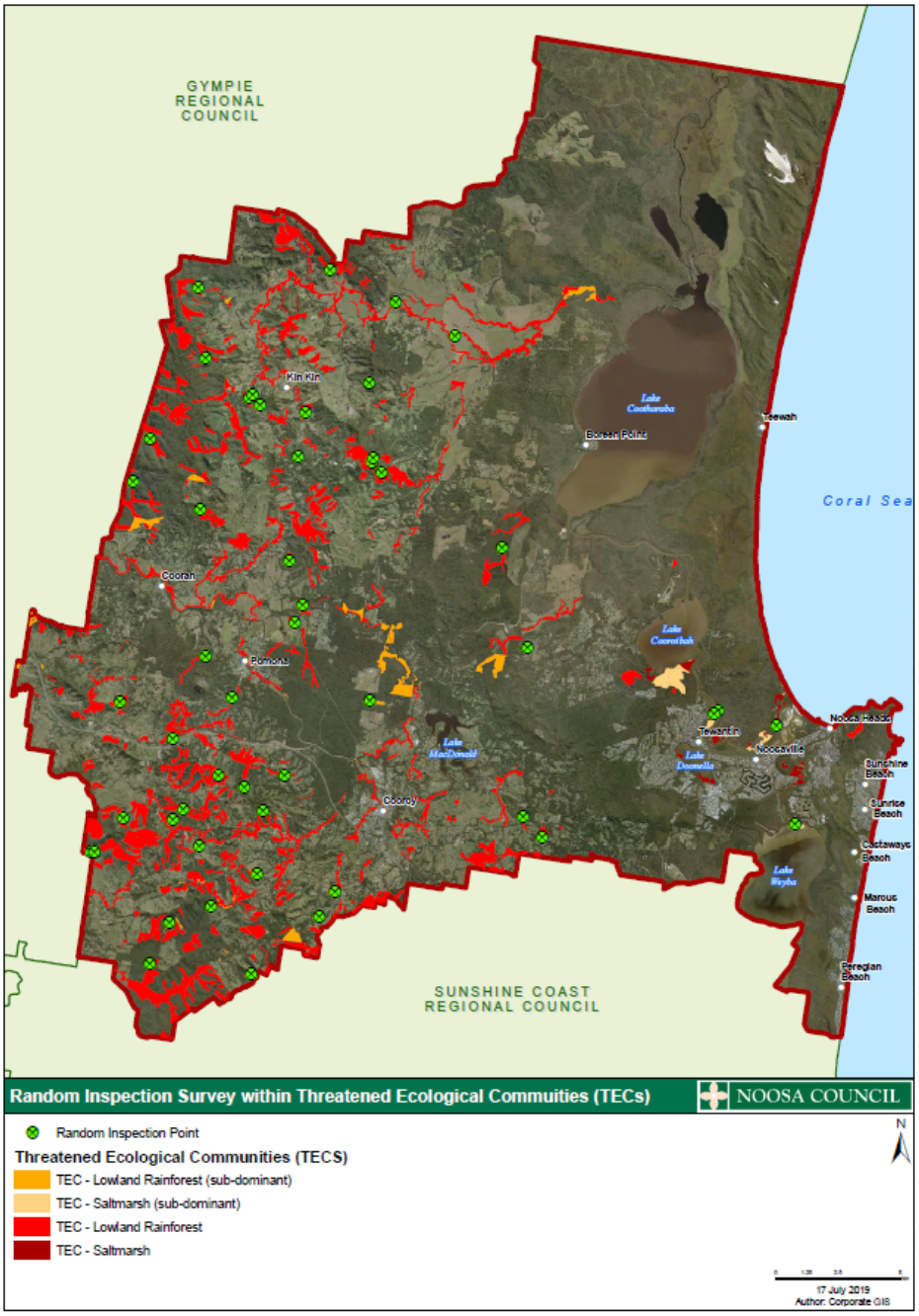
To further build knowledge on the distribution and abundance of invasive species, Council has developed an annual Shire wide random survey program. A randomised survey helps remove bias from the collection of data which is often in areas of where people reside or travel (e.g. along roadways). The survey covers both public and private land.



Map 5: Shire wide random survey design for invasive species. In this example 50 new sites are randomly generated each year for the survey.

6.2.3 Targeted surveys

Annual targeted surveys help improve understanding of the distribution and abundance of invasive species in specific areas such as high biodiversity value ecosystems. This information helps inform priority management actions. Map 6 shows a random plot design for surveys within saltmarsh and lowland rainforest which are Threatened Ecological Communities (TECs).



Map 6: Annual targeted random plot surveys within saltmarsh and lowland rainforest (Threatened Ecological Communities (TECs))

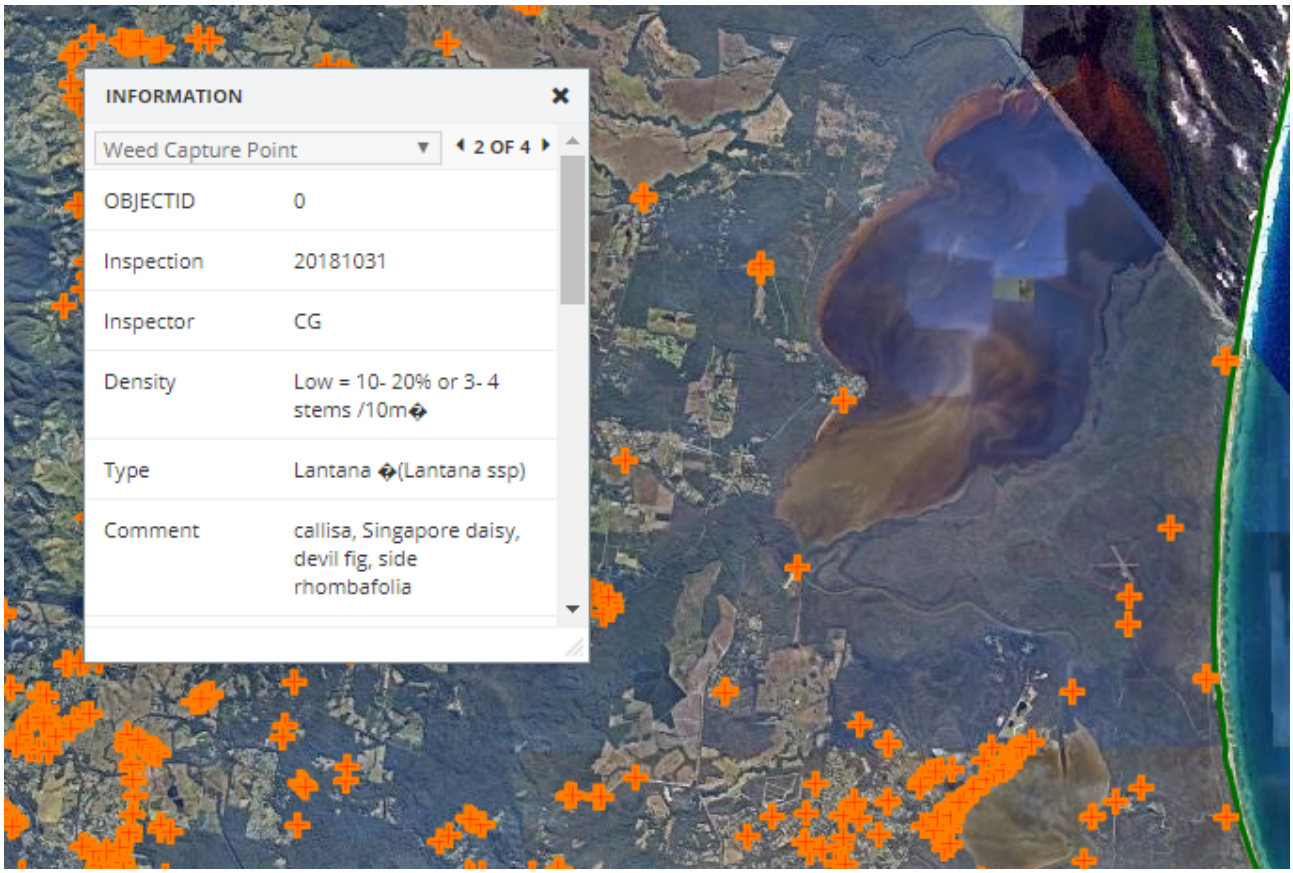
Surveys can also be species specific. For example sand plot monitoring can be used to determine the presence of dogs and foxes based on footprints left in sand plots.

Sand plot tracking for feral animals (Photo: PestSmart)

6.3 Data collection applications

6.3.1 'Collector App'-Council

Council utilises mobility devices and applications to better support staff in the field. Staff use tablets or mobile phones with 'Collector App' to record invasive species presence and management response. Sites are re-visited to assess the effectiveness of management controls over time. Collector App can also be used for targeted citizen science projects to gather more data and information from residents across the Shire.



Map 7: Use of a tablet 'Collector App' to collect on ground invasive species data

The Queensland Government Herbarium also has a ‘Weed Spotter App’ which provides a weed identification service.

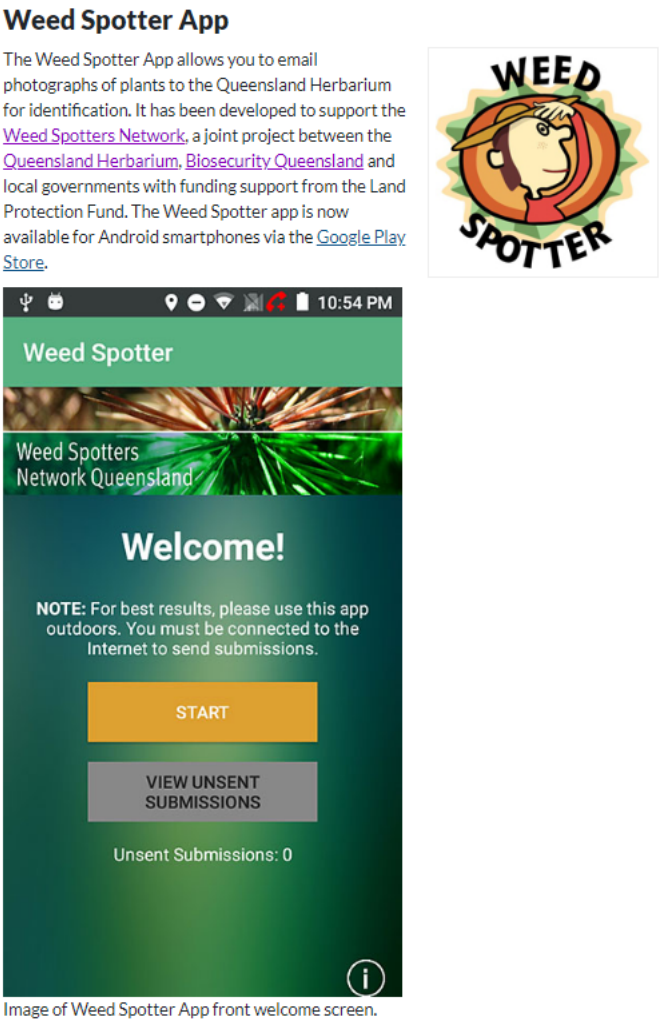


Figure 5: Queensland Government Weed Spotter App

7. Community engagement

Essential to the success of implementing biosecurity programs is strong community engagement. The Noosa Biosecurity Plan is promoted through:

- Community engagement processes during its development
- Displays at public events
- Updated websites with links to biosecurity resources
- Utilising existing networks to promote the importance of managing biosecurity matters.

8. Summary

The Noosa Biosecurity Plan provides Council and community with a framework to manage invasive animals and plants in a practical and meaningful way. The Plan's objective is to manage invasive plant and animal biosecurity risks to people, biodiversity, and the local economy based on priorities and actions that are practical for all landowners. To help achieve these objectives an implementation Action Plan guides delivery over the next 5 years. Council appreciates efforts from landowners and volunteers to help protect Noosa's values from the threats of invasive plants and animals.

9. The Noosa Environment Strategy 2019

The Noosa Environment Strategy 2019 was developed to help protect and enhance Noosa's unique natural environment, while supporting a sustainable community lifestyle. The Strategy identified four key themes-biodiversity; waterways, wetlands and coasts; sustainable living; and climate change adaptation and resilience. The Noosa Biosecurity Plan 2020 supports the strategic outcomes identified in the Noosa Environment Strategy with targets relevant to the Noosa Biosecurity Plan 2020 shown below.

Target (from the Noosa Environment Strategy)	Baseline measurement	Role of the Noosa Biosecurity Plan
By 2030, there is no net loss of ecosystem values across the shire, and the condition of Council's priority bushland reserves are enhanced.	Bushland operational assessments (BOAs) will be undertaken, where they do not already exist, across priority Council-managed restoration initiatives and as identified in the Bushland Reserve Strategic Management Plan.	Prioritised weed management actions will lead to measurable improvement in BOAs in Council-managed reserves. Council supports prioritised weed management on private land through education and targeted landholder extension programs.
By 2030, populations of key threatened indicator species remain viable.	A baseline is to be developed for 6-8 key threatened species based on: • Representativeness across biological families • Representativeness across ecosystems • Iconic value to the Noosa community • Availability of existing data and records Depending on the species selected, there may already be existing data, however a new baseline for some species will be required.	Threats will be identified and managed for each of the identified key threatened species. Management will be prioritised based on this threat identification (for example, increased wild dog control to support koalas, or weed management to protect rare plants).
By 2030, 80% of all grazing land achieves best practice management for agriculture.	A baseline is to be developed using the ABCD framework and classification for grazing lands.	Prioritised weed management actions will lead to measurable improvement in agricultural areas of the Shire. Council supports prioritised weed management on private land through education and targeted landholder extension programs.

Table 9. Noosa Environment Strategy 2019 targets and relationship with the Noosa Biosecurity Plan 2020

The Noosa Environment Strategy 2019 also identifies specific activities or projects to help meet the above targets. The activities/projects relevant that guide the Noosa Biosecurity Plan 2020 are shown below.

Reference	Activity/Project
1	Undertake environmental restoration activities throughout Council's conservation reserves. Prepare Bushland Operational Assessments (BOAs) for Council reserves to monitor the success of work.
2	Reduce the threat of priority biosecurity risks, such as pest plants and animals, on Council land and support private landholders to do the same.
3	Support private landholders to achieve environment outcomes on their property through an expanded Land for Wildlife and Voluntary Conservation Agreement Program.
4	Undertake an urban environmental education program to improve environmental outcomes for urban wildlife in strategic locations
5	Scope and undertake monitoring programs on populations of 6-8 key representative threatened species, to mitigate against local extinctions.
6	Implement propagation programs that grow threatened plant species and result in new populations at appropriate, low-risk locations
7	Undertake targeted wild dog control in key Koala Habitat Areas as identified in Koala Threat Mapping.
8	Implement an Eastern Beaches dune rehabilitation program to improve the condition, species diversity and stability of dune ecosystems and enhance resilience to climate change.
9	Support on-ground actions with landholders that improve environmental, economic and social outcomes on rural properties throughout Noosa while contributing to long-term sustainability of rural landscapes in the Shire.

Table 10. Relevant activities and projects in the Noosa Environment Strategy 2019 that guide the Noosa Biosecurity Plan 2020.

10. Noosa Biosecurity Implementation Action Plan

The Noosa Biosecurity Implementation Plan supports the strategy objectives in the Noosa Environment Strategy. The Implementation Action Plan below shows how the Biosecurity Plan integrates with the activities and projects identified in the Noosa Environment Strategy.

Noosa Biosecurity Implementation Action Plan							
Ref	**Action**	**Noosa Environment Strategy 2019 activity/project**	**Indicator/Output**	**Responsibilities**	**Frequency**	**Resourcing**	**Timeframe**
1	Review Plan	1-9	Plan review	Council Environment Services	Annual	Existing budget	Ongoing
2	Regulate Schedule 2 Invasive Biosecurity Matters as per Qld *Biosecurity Act 2014*	2,3,7,9	Compliance is achieved by landholders	Council Environment Services and Queensland Government	As required	Existing budget	Ongoing
3	Qld Government, Council and private landowners work collaboratively to manage targeted biosecurity matters on their land	2,3,7,9	Invasive species are controlled through Qld Government, Council and private landowner collaboration	Council Environment Services, Parks and Gardens, Infrastructure Services, Qld Government, public, private landowners	As required	Existing budget	Ongoing
4	**Pest survey program** Undertake regular property surveys for biosecurity matters	1,3,5,7,8,9	4 rural localities are surveyed each quarter and landholders control invasive species as required	Environment Services	Quarterly	Existing budget	Ongoing
5	**Shire-wide survey** Improve knowledge on the distribution and abundance of invasive species through shire wide random plot surveys	1-9	50 random plot survey inspections per year	Council Environment Services	Annual	**New initiative**- Within existing resources and/or grant project	Ongoing

Noosa Biosecurity Implementation Action Plan							
Ref	**Action**	**Noosa Environment Strategy 2019 activity/project**	**Indicator/Output**	**Responsibilities**	**Frequency**	**Resourcing**	**Timeframe**
6	**Targeted surveys** Assess the impacts of invasive species on Threatened Ecological Communities (TECs)	2,5	50 random plot survey inspections per year	Council Environment Services and Natural Resource Management Groups	Annual	Within existing resources and/or grant project e.g. Kin Kin Catchment Cats Claw-Madeira Project	Ongoing
7	Raise community awareness of invasive species identified for '**Prevention'** and '**Eradication'** and threats from adjoining shires through- Environmental events (Noosa Show, Festival of Water) - Council Website - LfW and Bushcare networks - Other organisations (Country Noosa, Landcare) - Cooperation with other departments and agencies including Council's Parks and Gardens and Biosecurity Qld	1-9	New invasive species are **'Prevented'** from entering Noosa Shire. Species identified for '**Eradication'** are removed from shire. New threats from adjoining LGAs are reported to Council and controlled	Environment Services, Environment and Natural Resource Management Groups	**Events**- each September Weedbusters Week and Noosa Show Day **Council website update-** March 2020 **LfW promo**- quarterly	Within existing resources	Ongoing
8	Update data and mapping on invasive species based on historic CRMs, DA reports, Ecological Restoration Plans and local knowledge	1,3,4	Council invasive species mapping is updated and informs priority management actions	Environment Services, GIS, Development Services	Finite project	**New initiative $10,000 subject to budget considerations**	Short-medium term

Noosa Biosecurity Implementation Action Plan							
Ref	**Action**	**Noosa Environment Strategy 2019 activity/project**	**Indicator/Output**	**Responsibilities**	**Frequency**	**Resourcing**	**Timeframe**
9	Investigate incentives/rebates that that would encourage landowners to meet biosecurity obligations	2,7	Report to Council	Environment Services	Finite project	**New initiative** Within existing resources	Medium term
10	Participate in SEQ Pest Advisory Forum (SEQPAF) and attend meetings	1-9	Attendance at forums	Environment Services and Queensland Government	Once every 4 months	Existing budget	Ongoing
11	Review wild dog control program in relation to koala habitat areas	7,9	Wild dog control is undertaken in areas which demonstrate a benefit for both landowners and koalas	Environment Services and University of Sunshine Coast	Finite project	**New initiative** USC work placement program	Short-medium term
12	Contribute to Biosecurity Queensland Land Protection Fund-On-ground works and research as a requirement of *Biosecurity Act 2014*	1,2,3,9	Funds support administration and research into managing biosecurity matters	Environment Services	Annual	$23,000 allocated per annum	Ongoing
13	Climate change pressures are considered with invasive species management	2,5,8,9	Invasive species prioritisation table is updated based on climate change predictive tools	Environment Services and Queensland Government	Annual	Existing budget	Ongoing
14	Continue to explore emerging technologies and techniques for invasive species management, including alternatives to chemical controls	1-9	New technologies and techniques are trialled for efficacy in Noosa.	Environment Services and Queensland Government	Annual	Existing budget	Ongoing

Table 11. Noosa Biosecurity Implementation Action Plan

The timing of the Noosa Biosecurity Implementation Action Plan is shown below.

Biosecurity Implementation Action Plan reference	Year 1				Year 2				Year 3				Year 4				Year 5				Environment Strategy activities or project reference
1. Plan review																					All
2. Regulation																					2,3,7,9
3. Collaborative projects e.g. Wild dog control																					2,3,7,9
4. Annual Pest Survey Program																					1,3,5,7,8,9
5. Annual Shire-wide surveys-**NEW**																					All
6. Annual Targeted TEC surveys																					2,5
7. Raise awareness of invasive species																					All
8. Update data and mapping-**NEW**																					1,3,4
9. Investigate incentives/rebates -**NEW**																					2,7
10. Participate in SEQ Pest Advisory forum																					All
11. Review wild dog control program re: koalas-**NEW**																					7,9
12. Contribute to Biosecurity Qld Fund																					1,2,3,9
13. Consider climate change pressures																					2,5,8,9
14. Explore alternative control methods																					All

Ongoing
Short term
Medium term
Long term

Table 12. Timing for the delivery of Noosa Biosecurity Implementation Action Plan

11. Appendices

11.1 Invasive species list

Biosecurity Act 2014
Schedule 1, Part 3 Invasive biosecurity matters - invasive plants

acacias non-indigenous to Australia (Acaciella spp., Mariosousa spp., Senegalia spp. and Vachellia spp. other than Vachellia nilotica, Vachellia farnesiana)
anchored water hyacinth (*Eichhornia azurea*)
annual thunbergia (*Thunbergia annua*)
bitterweed (*Helenium amarum*)
candleberry myrtle (*Morella faya*)
cholla cactus (Cylindropuntia spp. and hybrids other than *C. fulgida, C. imbricata, C. prolifera, C. rosea, C. spinosior* and *C. tunicata*) WONS
Christ's thorn (*Ziziphus spina-christi*)
Eurasian water milfoil (*Myriophyllum spicatum*)
fanworts (Cabomba spp. other than *C. caroliniana*)
floating water chestnuts (Trapa spp.)
harrisia cactus (Harrisia spp. syn. Eriocereus spp. other than *H. martinii, H. tortuosa* and *H. pomanensis syn. Cereus pomanensis*)
honey locust (Gleditsia spp. other than *G. triacanthos*)
horsetails (Equisetum spp.)
kochia (*Bassia scoparia syn. Kochia scoparia*)
lagarosiphon (Lagarosiphon major)
mesquites (all Prosopis spp. and hybrids other than *P. glandulosa, P. pallida and P. velutina*) WONS
Mexican bean tree (all Cecropia spp. other than *C. pachystachya, C. palmata and C. peltata*)
miconia (Miconia spp. other than *M. calvescens, M. cionotricha, M. nervosa and M. racemosa*)
mikania (Mikania spp. other than *M. micrantha*)
Peruvian primrose bush (*Ludwigia peruviana*)
prickly pear (Opuntia spp. other than *O. aurantiaca, O. elata, O. ficus-indica, O. microdasys, O. monacantha, O. stricta, O. streptacantha and O. tomentosa*)
red sesbania (*Sesbania punicea*)
salvinias (Salvinia spp. other than *S. molesta*) WONS
serrated tussock *(Nassella trichotoma*) WONS
Siam weed (Chromolaena spp. other than *C. odorata and C. squalida*)
spiked pepper (*Piper aduncum*)
tropical soda apple (*Solanum viarum*)
water soldiers (*Stratiotes aloides*)
witch weeds (Striga spp. other than native species)

Schedule 1, Part 4 Invasive biosecurity matters - invasive animals
All amphibians, mammals and reptiles **other than** the following —

amphibians, mammals and reptiles that are restricted matter
amphibians, mammals and reptiles indigenous to Australia, including marine mammals of the orders Cetacea, Pinnipedia and Sirenia
alpaca (*Lama pacos*)
asian house gecko (*Hemidactylus frenatus*)
axolotl (*Ambystoma mexicanum*)
bison or American buffalo (*Bison bison*)
black rat (*Rattus rattus*)
camel (*Camelus dromedarius*)
cane toad (*Rhinella marina syn. Bufo marinus*)
cat (*Felis catus and Prionailurus bengalensis x Felis catus*)
cattle (*Bos spp.*)
chital (axis) deer (*Axis axis*)
dog (*Canis lupus familiaris*)
donkey (*Equus asinus*)
European hare (*Lepus europaeus*)
fallow deer (*Dama dama*)
goat (*Capra hircus*)
guanicoe (*Lama guanicoe*)
guinea pig (*Cavia porcellus*)
horse (*Equus caballus*)
house mouse (*Mus musculus*)
llama (*Lama glama*)
mule (*Equus caballus x Equus asinus*)
pig (*Sus scrofa*)
red deer (*Cervus elaphus*)
rusa deer (*Rusa timorensis syn. Cervus timorensis*)
sewer rat (*Rattus norvegicus*)
sheep (*Ovis aries*)
water buffalo (*Bubalus bubalis*)

Schedule 2 Invasive biosecurity matters-restricted matter and categories

Grey highlight - Recorded in Noosa Shire.

Yellow highlight – In adjoining Shire but not in Noosa yet

WONS-Weeds of National Significance

Invasive plants	
African boxthorn (*Lycium ferocissimum*) WONS	3
African fountain grass (*Cenchrus setaceum*)	3
African tulip tree (*Spathodea campanulata*)	3
alligator weed (*Alternanthera philoxeroides*) WONS	3
annual ragweed (*Ambrosia artemisiifolia*)	3
asparagus fern (*Asparagus aethiopicus, A. africanus* and *A. plumosus*) WONS	3
asparagus fern (*Asparagus scandens*) WONS	3
athel pine (*Tamarix aphylla*) WONS	3
badhara bush (*Gmelina elliptica*)	3
balloon vine (*Cardiospermum grandiflorum*)	3
belly-ache bush (*Jatropha gossypiifolia* and hybrids) WONS	3
bitou bush (*Chrysanthemoides monilifera* ssp. *rotundifolia*) WONS	2,3,4,5
blackberry (*Rubus anglocandicans*, *Rubus fruticosus* aggregate) WONS	3
boneseed (*Chrysanthemoides monilifera* ssp. *monilifera*) WONS	2,3,4,5
bridal creeper (*Asparagus asparagoides*)	2,3,4,5
bridal veil (*Asparagus declinatus*)	3
broad-leaved pepper tree (*Schinus terebinthifolius*)	3
cabomba (*Cabomba caroliniana*) WONS	3
camphor laurel (*Cinnamomum camphora*)	3
candyleaf (*Stevia ovata*)	3
cane cactus (*Austrocylindropuntia cylindrica*)	3
cat's claw creeper (*Dolichandra unguis-cati*) WONS	3
Chilean needle grass (*Nassella neesiana*) WONS	3
chinee apple (*Ziziphus mauritiana*)	3
Chinese celtis (*Celtis sinensis*)	3
cholla cacti with the following names—	
• coral cactus (*Cylindropuntia fulgida*)	3
• devil's rope pear (*C. imbricata*)	3
• Hudson pear (*Cylindropuntia rosea* and *C. tunicata*)	2,3,4,5
• jumping cholla (*C. prolifera*)	2,3,4,5
• snake cactus (*C. spinosior*)	3
Dutchman's pipe (*Aristolochia* spp. other than native species)	3

elephant ear vine (*Argyreia nervosa*)	3
Eve's pin cactus (*Austrocylindropuntia subulata*)	3
fireweed (*Senecio madagascariensis*) WONS	3
flax-leaf broom (*Genista linifolia*) WONS	3
gamba grass (*Andropogon gayanus*) WONS	3
giant sensitive plant (*Mimosa diplotricha* var. *diplotricha*)	3
gorse (*Ulex europaeus*) WONS	3
groundsel bush (*Baccharis halimifolia*)	3
harrisia cactus (*Harrisia martinii*, *H. tortuosa* and *H. pomanensis* syn. *Cereus pomanensis*)	3
harungana (*Harungana madagascariensis*)	3
honey locust (*Gleditsia triacanthos* including cultivars and varieties)	3
hygrophila (*Hygrophila costata*)	3
hymenachne or olive hymenachne (*Hymenachne amplexicaulis* and hybrids) WONS	3
Koster's curse (*Clidemia hirta*)	2,3,4,5
kudzu (*Pueraria montana* var. *lobata* syn. *P. lobata*, *P. triloba* other than in the Torres Strait Islands)	3
lantanas—	
• creeping lantana (*Lantana montevidensis*)	3
• lantana, common lantana (*Lantana camara*) WONS	3
limnocharis, yellow burrhead (*Limnocharis flava*)	2,3,4,5
Madeira vine (*Anredera cordifolia*) WONS	3
Madras thorn (*Pithecellobium dulce*)	2,3,4,5
mesquites—	
• honey mesquite (*Prosopis glandulosa*) WONS	3
• mesquite or algarroba (*Prosopis pallida*) WONS	3
• Quilpie mesquite (*Prosopis velutina*) WONS	3
Mexican bean tree (*Cecropia pachystachya*, *C. palmata* and *C. peltata*)	2,3,4,5
Mexican feather grass (*Nassella tenuissima*)	2,3,4,5
miconia with the following names—	
• *Miconia calvescens*	2,3,4,5
• *M. cionotricha*	2,3,4,5
• *M. nervosa*	2,3,4,5
• *M. racemosa*	2,3,4,5
mikania vine (*Mikania micrantha*)	2,3,4,5
mimosa pigra (*Mimosa pigra*) WONS	2,3,4,5
Montpellier broom (*Genista monspessulana*) WONS	3

mother of millions (*Bryophyllum delagoense* syn. *B. tubiflorum*, *Kalanchoe delagoensis*)	3
mother of millions hybrid (*Bryophyllum* x *houghtonii*)	3
ornamental gingers—	
• Kahili ginger (*Hedychium gardnerianum*)	3
• white ginger (*H. coronarium*)	3
• yellow ginger (*H. flavescens*)	3
parkinsonia (*Parkinsonia aculeata*) WONS	3
parthenium (*Parthenium hysterophorus*) WONS	3
pond apple (*Annona glabra*) WONS	3
prickly acacia (*Vachellia nilotica*) WONS	3
prickly pears—	
• bunny ears (*Opuntia microdasys*) WONS	2,3,4,5
• common pest pear, spiny pest pear (*O. stricta* syn. *O. inermis*) WONS	3
• drooping tree pear (*O. monacantha* syn. *O. vulgaris*) WONS	3
• prickly pear (*O. elata*) WONS	2,3,4,5
• tiger pear (*O. aurantiaca*) WONS	3
• velvety tree pear (*O. tomentosa*) WONS	3
• Westwood pear (*O. streptacantha*) WONS	3
privets—	
• broad-leaf privet, tree privet (*Ligustrum lucidum*)	3
• small-leaf privet, Chinese privet (*L. sinense*)	3
rat's tail grasses—	
• American rat's tail grass (*Sporobolus jacquemontii*)	3
• giant Parramatta grass (*S. fertilis*)	3
• giant rat's tail grass (*S. pyramidalis* and *S. natalensis*)	3
rubber vines—	
• ornamental rubber vine (*Cryptostegia madagascariensis*)	3
• rubber vine (*C. grandiflora*) WONS	3
sagittaria (*Sagittaria platyphylla*) WONS	3
salvinia (*Salvinia molesta*) WONS	3
Scotch broom (*Cytisus scoparius*) WONS	3
Senegal tea (*Gymnocoronis spilanthoides*)	3
Siam weed with the following names—	
• *Chromolaena odorata*	3
• *C. squalida*	3
sicklepods—	

• foetid cassia (*Senna tora*)	3
• hairy cassia (*S. hirsuta*)	3
• sicklepod (*S. obtusifolia*)	3
silver-leaf nightshade (*Solanum elaeagnifolium*)	3
Singapore daisy (*Sphagneticola trilobata* syn. *Wedelia trilobata*)	3
telegraph weed (*Heterotheca grandiflora*)	3
thunbergia (*Thunbergia grandiflora* syn. *T. laurifolia*)	3
tobacco weed (*Elephantopus mollis*)	3
water hyacinth (*Eichhornia crassipes*) WONS	3
water lettuce (*Pistia stratiotes*)	3
water mimosa (*Neptunia oleracea* and *N. Plena*)	2,3,4,5
willows (all *Salix* spp. other than *S. babylonica*, *S.* x *calodendron* and *S.* x *reichardtii*) WONS	3
yellow bells (*Tecoma stans*)	3
yellow oleander, Captain Cook tree (*Cascabela thevetia* syn. *Thevetia peruviana*)	3
Invasive animals	
barbary sheep (*Ammotragus lervia*)	2,3,4,5,6
blackbuck antelope (*Antilope cervicapra*)	2,3,4,5,6
cat (*Felis catus* and *Prionailurus bengalensis* x *Felis catus*), other than a domestic cat	3,4,6
dingo (*Canis lupus dingo*)	3,4,5,6
dog (*Canis lupus familiaris*), other than a domestic dog	3,4,6
European fox (*Vulpes vulpes*)	3,4,5,6
European rabbit (*Oryctolagus cuniculus*)	3,4,5,6
feral chital (axis) deer (*Axis axis*)	3,4,6
feral fallow deer (*Dama dama*)	3,4,6
feral goat (*Capra hircus*)	3,4,6
feral pig (*Sus scrofa*)	3,4,6
feral red deer (*Cervus elaphus*)	3,4,6
hog deer (*Axis porcinus*)	2,3,4,5,6
red-eared slider turtle (*Trachemys scripta elegans*)	2,3,4,5,6
feral rusa deer (*Rusa timorensis*, syn. *Cervus timorensis*)	3,4,6
sambar deer (*Rusa unicolor*, syn. *Cervus unicolor*)	2,3,4,5,6
Tramp ants	
yellow crazy ant (*Anoplolepis gracilipes*)	3

Non-scheduled invasive species (mostly environmental weeds):

There are hundreds of invasive species in Noosa Shire that are not scheduled under the *Biosecurity Act 2014*. Some examples are shown below (source: Noosa's Worst Weeds, Noosa Integrated Catchment Association (NICA)).

Common name	**Scientific name**
Archer axillaris	*Macrotyloma axillare* var. *axillare*
Cadaghi	*Corymbia torrelliana*
Cocus palm	*Syagrus romanzoffiana*
Duranta	*Duranta repens*
Easter cassia	*Senna pendula* var. *glabrata*
Fishbone fern	*Nephrolepis cordifolia*
Gloriosa Lily	*Gloriosa superba*
Glycine	*Neonotonia wightii*
Impatiens	*Impatiens* spp.
Mickey mouse plant	*Ochna serrulata*
Mile-a-minute	*Ipomoea cairica*
Morning glory	*Ipomoea indica*
Setaria	*Setaria sphacelate*
Silver-leaved Desmodium	*Desmodium uncinatum*
Siratro	*Macroptilium atropurpureum*
Slash pine	*Pinus* spp.
Umbrella tree	*Schefflera actinophylla*

11.2 Useful websites on invasive species

Biosecurity Qld fact sheets https://www.daf.qld.gov.au/business-priorities/biosecurity
Marcus Beach Bushland Association https://mbba.org.au/our-worst-weeds/
Noosa & District Landcare https://noosalandcare.org/
Noosa Council https://www.noosa.qld.gov.au/weed-management
Noosa Council https://www.noosa.qld.gov.au/pest-animals
Noosa Parks Association-Botany Group https://noosaparks.org.au/botany-group/
Noosa Native Plants http://noosasnativeplants.com.au
Qld Government Weed Spotters Network
https://www.qld.gov.au/environment/plants-animals/plants/herbarium/weeds/weed-spotters
Weed Society of Qld, http://www.wsq.org.au/
Weeds of the Sunshine Coast https://noosariver.com.au/weeds-of-the-sunshine-coast/

Bitou bush *Chrysanthemoides monilifera ssp. Rotundifoli*
Photo: Queensland Department of Agriculture and Fisheries