BYRON SHIRE COUNCIL

Feral Animal (wild dog, fox and cat) Management Plan 2013-2015

January 2013

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Front page photo: Jim Rogers

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1. Introduction

Feral animals are recognised as having significant impacts on both livestock and wildlife. Councils Biodiversity Conservation Strategy recognises the impacts feral animals have on native species and in 2011 Council resolved to support Landcare Groups, land managers and landholders in the Shire to undertake a strategic wild dog, fox and cat control program and co-ordinate control with the Livestock Health and Pest Authority (LHPA) and National Parks and Wildlife Service (NPWS).

Council commenced a trapping program in late 2011, mainly targeting wild dogs but also foxes and cats. Significant trapping effort was carried out between March and September 2012 resulting in removal of 63 dogs, 21 foxes and 5 cats. The trapping program was successfully carried out on private land and involved financial support from both Council and landholders. Following this initial trapping program Council resolved to provide additional funding and an ongoing commitment to feral animal management.

This plan provides a framework for Byron Shire Council to work with stakeholders to undertake control actions to reduce the environmental, economic and social impacts of wild dogs, foxes and cats.

This plan aims to be complementary to the Regional Wild Dog Management Plan for the North Coast Livestock Health and Pest Authority Area 2011-2015, and Northern Rivers Wild Dog poster plan for Area 2 and 3 (in part).

1.1. Aims and objectives

This plan aims to support private land holders and land managers undertaking feral animal control and encourages a co-ordinated approach to feral animal management in Byron Shire.

Specific objectives are:

1. Increase community involvement in feral animal (wild dog, fox and cat) management in order to minimise impacts of predation on livestock and wildlife.
2. Minimise threats to public safety from wild dogs.
3. Record and share records of feral animal activity and impacts.
4. Increase collaboration within Council divisions, relevant agencies and stakeholders involved in domestic and feral animal management.
5. Monitor feral animal activity and impacts and evaluate the effectiveness of the plan.

1.2. Legislative and policy considerations

The following legislation applies to the management of feral animals carried out under this plan.

Table 1 Legislation relevant to management of feral animals in Byron Shire

Legislation	Overview
Rural Lands Protection Act 1998	Requires that all land managers in NSW have an obligation to control declared pest species (wild dogs) on their land.
Threatened Species Conservation Act 1995	Lists key threatening process and identifies threatened species at risk from predation in NSW. Guides the development of Threat Abatement Plans*, recovery plans and priority action statements (PAS).
Environmental Protection and Biodiversity Conservation Act 1999	Lists key threatening process and identifies threatened species at risk from predation in Australia. Guides the development of Threat Abatement Plans.*
Pesticides Act 1999	Regulates the use of pesticides in NSW. Use of sodium monofluoroacetate (1080) is controlled by a pesticide control order under this Act.
Prevention of Cruelty to Animals Act 1979	Regulates the humane handling and destruction of animals.
Firearms Act 1996 and Firearms (General) Regulation 1997	Regulates the ownership and use of firearms in NSW.
Workplace Health and Safety Act 2011	Governs the requirements to ensure and safe and healthy workplace.
Companion Animals Act 1998	Councils have the responsibility under this act to provide for effective and responsible care and management of companion animals.
Game and Feral Animal Control Act 2002 and Game and Feral Animal Control Regulation 2012	Provides for the effective management of introduced species of game animals, and to promote the responsible and orderly hunting of game animals on public and private land and of certain pest animals on public land.
Local Government Act 1993	Defines a Council's charter to include: *properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is*

	responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development

* Red foxes and feral cats are classed as nuisance animals in NSW and while there is no obligation for a landholder to control these species, they are recognised as a significant threat to biodiversity through the declaration of 'Predation by the European Red Fox' and 'Predation by the Feral Cat' as a key threatening processes under the *Threatened Species Conservation Act 1995* and *Environmental Protection and Biodiversity Conservation Act 1999.* Threat abatement plans, have been prepared for the Red fox under the *Threatened Species Conservation Act* and for feral cats under the *Environmental Protection and Biodiversity Conservation Act 1999.* These plans provide a strategy for managing the threats and impacts posed by these species.

Other plans and strategies relevant to the management of animals in the Byron Shire include:

- Regional Wild Dog Management Plan for the North Coast Livestock Health and Pest Authority Area 2011-2015
- Northern Rivers Wild Dog poster plan for Area 2 and 3 (in part).
- Northern Rivers Region Pest Animal Strategy 2012- 2015 – Office Environment and Heritage
- Feral Animal Control Plan, West Byron Sewage Treatment Works 2004 – Byron Shire Council.
- Companion Animal Management Plan 2000 – Byron Shire Council

Control of feral animals is consistent with the Byron Biodiversity Conservation Strategy 2004 in regard to the key themes of *Community Involvement & Education*, *Environmental Weeds & Introduced Pests* and *Threatened Species.*

1.3. Target Species

1.3.1. Wild dogs

All wild-living dogs including dingoes, feral dogs and hybrids are included as wild dogs under the *Rural Land Protection Act 1998* (*RLP Act*). Wild dog refers to any dog living in the wild and can be divided into three groups:

- Dingoes (*Canis lupus dingo*); native dogs brought from Asia around 5000 years ago which are related to wolves. Pure dingoes are populations or individual that have not hybridised with domestic dogs.
- Feral dogs (*Canis lupus familiaris*): dogs that where once domesticated but are now living wild.
- Hybrids: dogs resulting from cross breeding of dingoes and domestic or feral dogs.

In NSW under the *Rural Lands Protection Act 1998* wild dogs, including dingoes, have been declared a pest animal throughout NSW.

1.3.2. European Red Foxes

The European red fox (*Vulpes vulpes*) has a natural distribution across the continents of Europe, Asia and North America. Foxes were deliberately introduced into Australia in the 1850's for recreational hunting. A range of characteristics combine to make the fox an extremely successful invasive animal including having a wide dietary range,

few serious diseases, few natural enemies, a high reproductive rate and a high rate of cub survival.

1.3.3. Cats

Feral cats (*Felis catus*) were introduced to Australia early during European settlement and were established in the wild by 1850. Intentional releases were made in the late 1800s in the hope that cats would control rabbits, rats and mice. Feral cats are now found in most habitats on the mainland, Tasmania and many offshore islands.

For management purposes cats are divided into three categories - domestic, stray and feral. Domestic cats are owned and cared for, and stray cats are those found roaming cities, towns and some rural holdings. Cats in all categories cause impacts on wildlife, however feral cats, which survive in the wild, are the target for management in this plan.

1.4. Feral Animal Distribution

Currently there is limited information regarding the exact distribution and abundance of wild dogs, foxes and cats in Byron Shire. The recent land use and social demographic changes in the Shire, from predominantly livestock industries to horticulture and lifestyle properties, has increased the suitable habitat for feral animals. All three species have been reported over much of the Shire and could be expected to occur in most areas.

Wild dogs have been observed in most areas of the Shire, based on reported sightings to Council and from the DogScan website. Highest activity levels have been reported in Goonengerry, Upper Coopers Creek, Huonbrook, The Pocket, Mt Chincogan, Main Arm, Mullumbimby Creek and Wilson Creek. However, wild dogs have also been reported in more cleared areas including Coopers Shoot, Bangalow, Coorabel and Ewingsdale.

Records of foxes have been recorded at Byron Bay, Broken Head, Goonengerry and Clunes on the FoxScan website. NPWS undertake baiting for foxes in Brunswick Heads and Tyagarah Nature Reserves. This represents a wide distribution in a variety of habitat types and as such foxes could be expected to occur in most areas of the Shire.

Information regarding feral cats is the scarcest, however given their ability to adapt to a variety of areas they could be expected to occur in most areas except perhaps dense rainforest vegetation.

1.5. Schedule 2 – Dingo Conservation Areas

To balance the need to control wild dogs with the conservation of dingoes, Pest Control Order 17 allows the general destruction obligation for lands listed under Schedule 2 of the Order to be satisfied through the preparation of a Wild Dog Management Plan. Wild Dog Management Plans for these areas include both control and conservation objectives. Schedule 2 areas in Byron Shire include Mt Jerusalem, Goonengerry and Nightcap National Park and Whian Whian State Conservation Area. Schedule 1 areas include all other lands and in these areas wild dogs, including dingoes, are a declared pest and landowners have an obligation to control them.

Dingoes were once widespread however historic eradication programs and hybridisation with domestic and feral dogs significantly impacted on dingo

populations. Currently the extent of pure dingo populations in the north coast region is unclear. Research in some areas of Australia has indicated that the dingoes, and wild dogs, can play an important role as top order predators and can potentially reduce the abundance of other feral predators such as the red fox and cat (Glen *et al* 2007).

Opportunistic collection of tissue samples during Councils 2012 trapping program provided 27 samples of wild dog DNA which were analysed to assess the approximate percentage of dingo ancestry for each individual. All of the samples provided enough DNA for analysis and the results show that all the samples are considered hybrids between domestic dogs and dingoes, with all samples having between 51% and 81% dingo ancestry.

1.6. Stakeholders

Table 2 lists relevant stakeholders in regard to feral animal control in Byron Shire.

Table 2 List of stakeholders

Stakeholder	Role
Byron Shire Council	• Control feral animals on Council managed land including wild dog control in compliance with the *RLP Act* 1998 and in line with relevant *Standard Operating Procedures*. • Support private landholders to control feral animals on private land. • Provide information on responsible dog ownership and control options available.
North Coast Livestock Health and Pest Authority	• Assist private land managers and public land managers to 'continuously suppress and destroy' wild dogs.
National Parks and Wildlife Service	• Undertake wild dog and fox control in compliance with the *RLP Act* 1998 and in line with relevant *Standard Operating Procedures*. • Implement and monitor control programs in accordance with Northern Rivers Region Pest Animal Strategy.
Byron Shire private land managers	• Undertake wild dog control in compliance with the *RLP Act* 1998 and in line with *Standard Operating Procedures*. • Control foxes and cats with support from Council and LHPA. • Ensure domestic animals are not allowed to roam freely unsupervised.
Department of Primary Industries – Catchment and Lands	• Undertake wild dog control in compliance with the *RLP Act* 1998 and in line with *Standard Operating Procedures*.
Landcare groups	• Promote responsible pet ownership, feral animal control options and programs. • Assist in coordinating control programs on private land.
Invasive Animals Cooperative Research Centre	• Provide advice and support to Council and other stakeholders.

2. Impacts of feral animals

2.1. Livestock

Wild dogs and foxes can have significant impacts on primary production. In Byron Shire wild dogs impact on the cattle industry, particularly targeting calves as well as sheep, alpacas, poultry, domestic dogs and horses. Predation by wild dogs can lead to loss of calves and associated financial loss, increase labor requirement in terms of stock management (moving stock to secure paddocks, higher monitoring requirement during calving season etc), emotional distress of witnessing attacked livestock. Foxes can impact on livestock particularly smaller livestock such as poultry, as well as spreading disease (see 2.4 below).

2.2. Wildlife

The threat posed by pest animals to biodiversity has been identified as the fourth largest in NSW behind land clearing, weeds and altered fire regime, in terms of total number of species at risk. Predation by feral dogs (*Canis lupus familiaris*), foxes and cats have all been listed as Key Threatening Process' under the *Threatened Species Conservation Act 1995*.

Wild dogs prey on a variety of animals including mammals, birds and reptiles of all sizes from insects to cattle. They mainly prey on medium-large sized mammals when available including possums, bandicoots and wallabies. Predation by wild dogs has been identified as a threat to 36 species listed as threatened in NSW, 13 of these species have been recorded in Byron Shire (Coutts Smith *et al* (2007) Appendix 1).

Uncontrolled domestic dogs are an ongoing issue across the landscape particularly in the urban fringe and rural residential areas. Roaming domestic dogs are often reported as being responsible for death and injury to native wildlife, particularly koalas.

Foxes prey particularly on small to medium-sized, ground-dwelling and semi-arboreal mammals, ground-nesting birds and chelid tortoises. Foxes have been shown to cause more impacts on wildlife, compared with wild dogs, due to their larger diversity of prey species (Claridge *et al* 2010, Glen *et al* 2006). A total of 111 threatened species in NSW were identified as at risk from foxes, including 31 species which occur in Byron Shire (Coutts Smith *et al* (2007) Appendix 1).

Feral cats prey mainly on small to medium sized mostly birds, mammals and reptiles. They pose a threat to more native species than any other pest animal or weed. In NSW they have been identified as a threat to 117 threatened species, 32 of these species occur in Byron Shire (Coutts Smith *et al* (2007) Appendix 1).

2.3. Public safety

Wild dogs can cause concerns for public safety particularly when they form packs. Council has received reports from residents of wild dogs being active close to houses in Main Arm, Wilson Creek and Huonbrook areas as well as in farming areas around Federal, Clunes and Booyong.

2.4. Disease

Wild dogs are implicated in the spread of hydatid tapeworm which is a risk to both human health and livestock due to hydatidosis. They also provide a reservoir for heartworm infection and dog diseases such as parvovirus. Wild dogs are a major potential risk of maintaining and spreading dog rabies if it were to be introduced to Australia. In high density areas foxes may pose a risk to humans and pets, through transmission of diseases such as distemper, parvo virus and mange. Feral cats can

carry infectious diseases such as toxoplasmosis and sarcosporidiosis, which can be transmitted to native animals, domestic livestock and humans.

3. Management of Feral Animals

Determining the most appropriate method for managing the impact of pest animals needs to consider several factors including efficacy, cost-effectiveness, practicality, target specificity, operator safety, and also humaneness (or animal welfare impact). National Codes of Practice (COPs) and Standard Operating Procedures (SOPs) for the humane control of pest animals must be complied with when undertaking control programs.

3.1. Control Options

3.1.1. Baiting

Use of Sodium monofluoroacetate (1080) baits is considered to be the most effective method of controlling dogs and foxes over larger areas and is therefore the most used method of fox and wild dog control throughout Australia. It is not legal to use 1080 baits to poison cats.

The SOPs *DOG004 Ground baiting of wild dogs with 1080*, and *FOX001 Ground baiting of foxes with 1080* provides an overview of the use of 1080 baits. All baiting carried out as part of this plan must be in line with these SOPs and relevant legislation.

3.1.2. Padded Jaw trapping

Padded jaw traps are often used in conjunction with baiting programs. Use of padded jaw traps reduces the injuries caused to trapped animals. Trapping is often employed when other control methods are not available (eg. in peri urban areas where laying of baits cannot be undertaken) or not effective (eg. to target problem animals that do not take baits).

The SOPs *DOG001Trapping of wild dogs using padded jaw traps*, and *FOX005 trapping of wild dogs using padded jaw traps* provides guidelines for the use of padded jaw traps. All trapping carried out as part of this plan must be in line with these SOPs and relevant legislation.

3.1.3. Shooting

Shooting is usually an opportunistic method of control and can be used to target specific problem animals. It is labor intensive and considered an ineffective technique to reduce populations of wild dogs over extensive areas.

3.1.4. Den fumigation

Fumigation of fox dens with carbon monoxide (CO) gas can be used to control foxes particularly to destroy young cubs. Den fumigation can be effective to target active dens but is not effective as a general fox control method and should be used in combination with other control methods.

SOP *FOX004 Fumigation of fox dens using carbon monoxide* provides an overview of the use of carbon dioxide to fumigate fox dens. Den fumigation undertaken as part of this plan must be carried out in line with this SOP.

3.2. Constraints

3.2.1. 1080 bait use

1080 is a restricted pesticide and can only be used by those people who are authorised and trained. The use of 1080 baits is restricted by the Pesticides Act 1999 - Pesticide Control (1080 Liquid concentrate and bait products) Order 2010 (PCO). The PCO sets out who can use 1080 baits to control specific pest animals and how it is used.

The PCO includes a number of restrictions on where 1080 baits can be used. This includes baiting in closely settled farming areas or areas within four (4) kilometres of a village or any street. Ground Baiting using 1080 for wild dogs and foxes must not be laid within 500 metres or 150 meters respectively of a habitation, except where a landholder uses 1080 baits on their own property, in which case the landholder may lay the 1080 baits closer to their own habitation.

However these conditions do not apply if the baiting program is planned in conjunction with, and has been approved by, an Authorised Control Officer (LHPA Ranger). A program approved under this condition must include strategies for minimising risk to non-target animals. This condition applies to proposals where an Authorised Control Officer plans a baiting program, in which case the 1080 wild dog baits may be laid closer to a habitation, subject to

- the Authorised Control Officer undertaking a risk assessment
- Any adjoining landholders agreeing in writing to use or allow the use of 1080 wild dog baits as part of a coordinated wild dog control program at distances of less than 500 metres but no closer than 150 metres from a habitation on the landholder's property;
- Landholders know the risk involved and accept responsibility for problems arising for the program

1080 wild dog baits must not be laid within 10 metres of a domestic water supply.

The restrictions on the use of 1080 have potential to reduce the area where baiting can be carried out and alternative control methods will need to be used in these areas.

3.2.2. Impacts on wildlife

Baiting and trapping have the potential to negatively impact off target species. Dogs and foxes are particularly susceptible to 1080 poison as are other mammalian carnivores; however herbivores, birds and reptile are less susceptible. A risk assessment is included in Appendix 4 which includes management actions to be taken to minimise the risk of off target impacts to wildlife.

4. Management Approach

The most effective approach to feral animal management involves a nil tenure approach were management is coordinated between all land managers. While Council owns and manages some lands, the majority of land in the Shire is privately owned. Therefore, to ensure effective management of feral animals at a landscape scale it is essential to encourage and support private landholders to undertake feral animal control. In addition collaboration with other agencies undertaking feral animal management in the Shire (i.e. NPWS, LHPA) is essential.

Council supports an integrated management approach where all appropriate management options are considered. Ground baiting is considered the most cost effective control method and should be employed where possible. Given the constraints on the use of 1080 baits the use of a soft jaw trapping is also considered an important component in the management response.

As such the main focus of Councils program will be the use of traps in areas where baiting with 1080: (a) has not been effective in targeting problem animals via alternative methods (b) is not possible due to constraints on use or (c) is not supported by landholder.

4.1.1. Community Involvement

Council's involvement in feral animal control is a way to support landholders to meet their obligation to control wild dogs under the *Rural Lands Protection Act.* Landholders and land managers will be encouraged to participate in management of feral animals by:

- Reporting sightings and impacts of feral animals to Council and the LHPA. This information will be recorded and used for monitoring feral location and evaluating the effectiveness of the management program.
- Provide advice and support to land holders regarding relevant legislation, responsibilities and management options, and refer enquiries to the LHPA. This will include advice regarding the role of relevant stakeholders in the management of feral animals.
- Forming local control groups with neighbouring landholders, in conjunction with LHPA, to ensure a broad scale management program is undertaken. LHPA actively encourage this approach in regards to wild dog control and some control groups are currently formed.
- Participating in the trapping program. Council will engage the services of an appropriately experienced and licensed trapper to work on private land. Landholders will be invited to participate in trapping program where impacts are being experienced.

Action 1: Promote feral animal control program in conjunction with LHPA and invite landholders experiencing feral animal impacts to be involved.

Action 2: Provide advice and support to landholders in conjunction with LHPA regarding feral animal management, responsibilities and options.

Action 3: Promote responsible pet ownership and highlight impacts of domestic animals on wildlife and link with issue of feral animals.

Action 4: Encourage land owners and land managers to complete training and undertake 1080 baiting in collaboration with LHPA.

4.1.2. Engagement with agencies

Within Byron Shire the Livestock Health and Pest Authority and the National Parks and Wildlife Service undertake or support wild dog and fox control programs. Coordinating Councils feral animal program with these agencies will improve the effectiveness of feral animal management across the broader area.

Action 5: Liaise with LHPA and NPWS regarding annual coordinated control programs.

4.1.3. Trapping Strategy

Although more resource intensive, trapping is considered an effective method of control to use as part of an integrated control program. Trapping can be used in combination with baiting in order to target bait shy animals, and in more highly populated areas where use of 1080 in constrained.

Council will support an integrated approach by engaging a suitably skilled and licensed trapper. Council will pay a retainer to the trapper and a 'fee per carcass' for each animal successfully trapped and euthanized will be payable by the landholder.

Landholders will be invited to express interest in participating in the program. This will include the requirement to demonstrate the commitment and capacity to fund the fee per carcass element of the program. Landholders expressing a willingness to collaborate on the program will be selected based on the prioritisation criteria (see below). The program will aim to complement existing activities and avoid duplication of control efforts.

Trapping will be carried out between Autumn and Spring in order to maximise capture of feral animals and minimise off target capture of native wildlife.

Given the limitation of Council resources it is important to prioritise where control effort will be focused to achieve the most effective results. In line with the model code of practice, priority will be given to areas that involve collaboration with regional control programs carried out by other agencies or landholders, as well as where significant impacts are occurring to livestock and wildlife.

The following situations are considered a HIGH PRIORY for control:

1. Sites that involve co-ordination with land management agencies involved in feral animal control program (i.e NPWS, LHPA)
2. Sites where there is an ongoing demonstrated commitment to control programs.

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Sites not meeting the above criteria will only be consider for inclusion in Councils control program as resources allow, or where considered appropriate based on local knowledge and experience of Council officers and/or the trapping contractor.

Landholders involved in the program will also be required to agree to information regarding control actions to be shared with the LHPA.

Action 6: Engage experienced and qualified trapper to undertake trapping on Council and private land.

Action 7: Develop and implement a strategic trapping schedule. Prioritise trapping location based on criteria outlined in 4.1.3

5. Data collection and project evaluation

Primarily monitoring of the management program will aim to collect information regarding the location and impacts of feral animals; the trapping activities and outcomes and the level of community involvement.

5.1. Feral animal location and impacts

The following observations can be used by landholders as an indicator of the presence of feral animals:

- Wild dog, fox or cat seen or heard.
- Dog tracks identified in areas domestic dogs are known not to be located.
- Sand pads or non toxic bait stations.
- Scat/ faeces and scratch marks.
- Livestock kills or damage/ or stressed animals.

Council flora and fauna databse will be used to record the location of feral animals and impacts caused. Information to be included in the database includes: location, date, species, abundance, method of observation, impact and any management response. This information should be shared with other stakeholders and be analysed over time to determine if control programs are reducing the reported sightings and impacts of feral animals.

Action 8: Record data of feral animal sightings and impacts in Council's flora and fauna database.

Action 9: Encourage landholders to report sightings and impacts of feral animals to Council and LHPA.

Action 10: Share records with relevant stakeholders.

5.2. Trapping activities and outcomes

A program will be established to monitor the outcomes of the trapping program. The information outlined in Table 3 will be collected in order to establish trap effort and outcomes.

Table 3 Information to be recorded during trapping program

Theme	Data required
Trapping Effort	Trapping dates
	Number of traps set each day
	Trap success each day
Trap location	Property
	GPS coordinates
Captures	Species
	Date of capture
	Sex
	Age Class
	Weight
	Pregnacy status

	Photo
	By catch
Impacts	Signs of feral animal activity
	Evidence of impacts on livestock
	Evidence of impacts of wildlife
Other	Weather
	other relevant observations

Action 11: Establish monitoring program of feral animal trapping effort, location, captures and impacts.

5.3. Scat and stomach analysis

Evaluating the ecological impact of feral animals can be achieved by examining their diet and the simplest way to do this is through scat analysis. This can also be achieved through examination of stomach contents which is also easily achieved as part of a trapping program. Scat analysis consists mainly of identifying mammalian hairs and examining bones, teeth and claws.

Analysis can give an indication of what species feral animals are preying on and, if the sample size is large enough, the proportion of each prey species within the predator's diet (Claridge *et al* 2012, Brunner and Wallis 1986). In addition DNA analysis is able to be performed on scats, which is desirable in the case of wild dogs to collect information regarding the level of hybridizing occurring within the wild dog population.

Collection of scats can be undertaken through transect surveys along forest and farm roads in a range of locations or opportunistically as part of the trapping program.

Action 12: Support a research and monitoring program to collect scats and stomach contents of feral animals trapped during the program for analysis.

Action 13: Support research in regard to dingo conservation, the ecological function of wild dogs and the impacts of feral animals on wildlife.

5.4. Infrared cameras

Infrared cameras are a monitoring tool that could be used for a variety of purposes. They could be used to confirm the presence of feral animals or native species in an area, as well as determine abundance, if included in an appropriate survey design. They can also be used to investigate animal behaviour without being influenced by the presence of people. Infrared camera also provide images that can be effectively used for community engagement/ awareness programs.

Action 14: Design and undertake monitoring program using infrared cameras in order to determine presence of feral animals and/ or behaviour at trap locations.

6. Action Summary

Action	Description	Timeframe	Responsibility and resources required	Priority	Desired outcome
1.	Promote feral animal control program in conjunction with LHPA and invite landholders experiencing feral animal impacts to be involved.	March 2013-ongoing	Existing staff time (Team Leader - Natural Environment), LHPA	High	List of participating landholders established.
2.	Provide advice and support to landholders in conjunction with LHPA regarding feral animal management, responsibilities and options.	Ongoing	Existing staff time, LHPA and NOROC wild dog project officer (until June 2013)	High	Advice provided, feral animal webpage on Council website established.
3.	Promote responsible pet ownership and highlight impacts of domestic animal on wildlife and link with issue of feral animals.	Ongoing	Existing staff time (Rangers) and NOROC wild dog project officer (until June 2013)	High	Decrease in roaming domestic animals (cats, dogs) and associated impacts.
4.	Encourage land owners and land managers to complete training and undertake 1080 baiting in collaboration with LHPA.	Ongoing	Existing staff time, LHPA and NOROC wild dog project officer (until June 2013)	High	Increase in baiting where impacts are occurring.
5.	Liaise with LHPA and NPWS regarding annual coordinated control programs.	March 2013-ongoing	Existing staff time (Team Leader - Natural Environment), LHPA, NPWS.	High	Stakeholder meeting occurs twice yearly in late Summer and Spring.
6.	Engage experienced and qualified trapper to undertake trapping on Council and private land as required.	March 2013 (yearly review)	Existing staff time (Team Leader - Natural Environment)	High	Experienced trapper engaged to undertake trapping work.

Action	Description	Timeframe	Responsibility and resources required	Priority	Desired outcome
7.	Develop and implement a strategic trapping program. Prioritise trapping location based on criteria outlined in 4.1.3	March – September (yearly)	$20,000 pa. for trapper (dependant on level of activity)	High	Trapping undertaken, decease in feral animal impacts.
8.	Record data of feral animal sightings and impacts in Council's flora and fauna database.	March 2013	Existing staff time (Team Leader - Natural Environment)	High	Records collected and entered into database.
9.	Encourage landholders to report sightings and impacts of feral animals to Council and LHPA.	Ongoing	Existing staff time (Team Leader - Natural Environment)	High	Reports received, if occurring.
10.	Share records with relevant stakeholders.	Ongoing	Existing staff time (Team Leader - Natural Environment)	High	Records shared with relevant stakeholders
11.	Establish monitoring program of feral animal trapping effort, location, captures and impacts.	March 2013	Existing staff time and trapper.	High	Monitoring program established.
12.	Support a research and monitoring program to collect scats and stomach contents of feral animals trapped during the program for analysis.	Ongoing	Existing staff time, trapper, partnerships with universities.	Low	Material collected, research occuring.
13.	Support research in regard to dingo conservation, the ecological function of wild dogs and the impacts of feral animals on wildlife.	Ongoing	Existing staff time, partnerships with university and Invasive Animal CRC.	Low	Increase level of research in region.
14.	Design and undertake monitoring program using camera traps.	March 2013	Existing staff time, trapper.	Medium	Camera traps used to monitor trapping and feral animal presence.

7. References and further reading

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Office of Environment and Heritage - 1080 user guidance fact sheet
http://www.environment.nsw.gov.au/pesticides/1080PCOfactsheet.htm#b

Wildsearch Ecological Services- for the Kyogle Branch NSW Farmers Association. *Upper Richmond Wild Dog and Fox control Plan 2011*

Appendix 1 Threatened species in Byron Shire at risk from feral animal predation

Species listed under the *NSW Threatened Species Conservation Act 1995 (TSC)* and the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC)*, at risk from predation by wild dogs, foxes and cats.

Scientific name	Common name	Conservation status	wild dog	fox	Cat
Aepyprymnus rufescens	Rufous bettong	TSC (V)		x	
Amaurornis olivaceaus	Bush hen	TSC(V)		x	x
Anseranus semipalmata	Magpie goose	TSC (V)		x	
Atrichornis rufescens	Rufus scrub wren	TSC (V)		x	x
Botaurus poiciloptilus	Australasian bittern	TSC (E1)		x	x
Burhinus grallarius	Bush stone curlew	TSC (E1)		x	x
Cercartetus nanus	Eastern pygmy possum	TSC (V)	x	x	x
Dasyornis brachypterus	Eastern bristle bird	TSC, EPBC (E1)		x	x
Dasyurus maculatus	Spotted tail quoll	TSC (V), EPBC (E)		x	x
Erythrotriorchis radiatus	Red goshawk	TSC (CE), EPBC (V)		x	
Esacus neglectus	Beach stone curlew	TSC (E4)	x	x	x
Grus rubicunda	Brolga	TSC (V)	x		
Haematopus fuliginosus	Sooty oyster-catcher	TSC (V)	x	x	x
Haematopus longirostris	Pied oyster-catcher	TSC (E1)	x	x	x
Ixobrychus flavicollis	Black Bittern	TSC (V)		x	x
Litoria aurea	Green and gold bell frog	TSC (E1), EPBC (V)		x	x
Marcopus parma	Parma Wallaby	TSC (V)		x	x
Menura alberti	Alberts lyrebird	TSC (V)	x	x	x
Miniopterus schreibersii oceanensis	Eastern bentwing bat	TSC (V)		x	x
Ninox connivens	Barking owl	TSC (V)		x	x
Ninox strenua	Powerful owl	TSC (V)	x	x	x
Nurus atlas	Atlas rainforest ground beetle	TSC (E1)			x
Nurus brevis	Shorter rainforest ground bettle	TSC (E1)			x
Onychoprion fuscata	Sooty tern	TSC (V)	x		x
Pachycephala olivacea	Olive whistler	TSC (V)		x	x

Petaurus norfolcensis	Squirrel glider	TSC (V)	x	x	x
Petrogale penicillata	Brush tail rock wallaby	TSC, EPBC (V)		x	
Phascolarctos cinereus	Koala	TSC (V), EPBC (V)	x		
Phascogale tapoatafa	Brush tail phascogale	TSC (V)		x	x
Planigale maculata	Common planigale	TSC (V)		x	x
Potorous tridactylus	Long nose potoroo	TSC (V), EPBC (V)	x	x	x
Pseudomys gracilicaudatus	Eastern chestnut mouse	TSC (V)	x	x	x
Pseudomys oralis	Hastings river mouse	TSC (E1), EPBC (E)		x	x
Pterodroma neglecta	Kermadec Petrel	TSC (V)			x
Pterodroma nigripennis	Black wing petrel	TSC (V)			x
Sternula albifrons	Little tern	TSC (E1)	x	x	x
Thylogale stigmatica	Red-legged pademelon	TSC (V)		x	x
Turnix melanogaster	Black breasted button quail	TSC (CE)		x	x

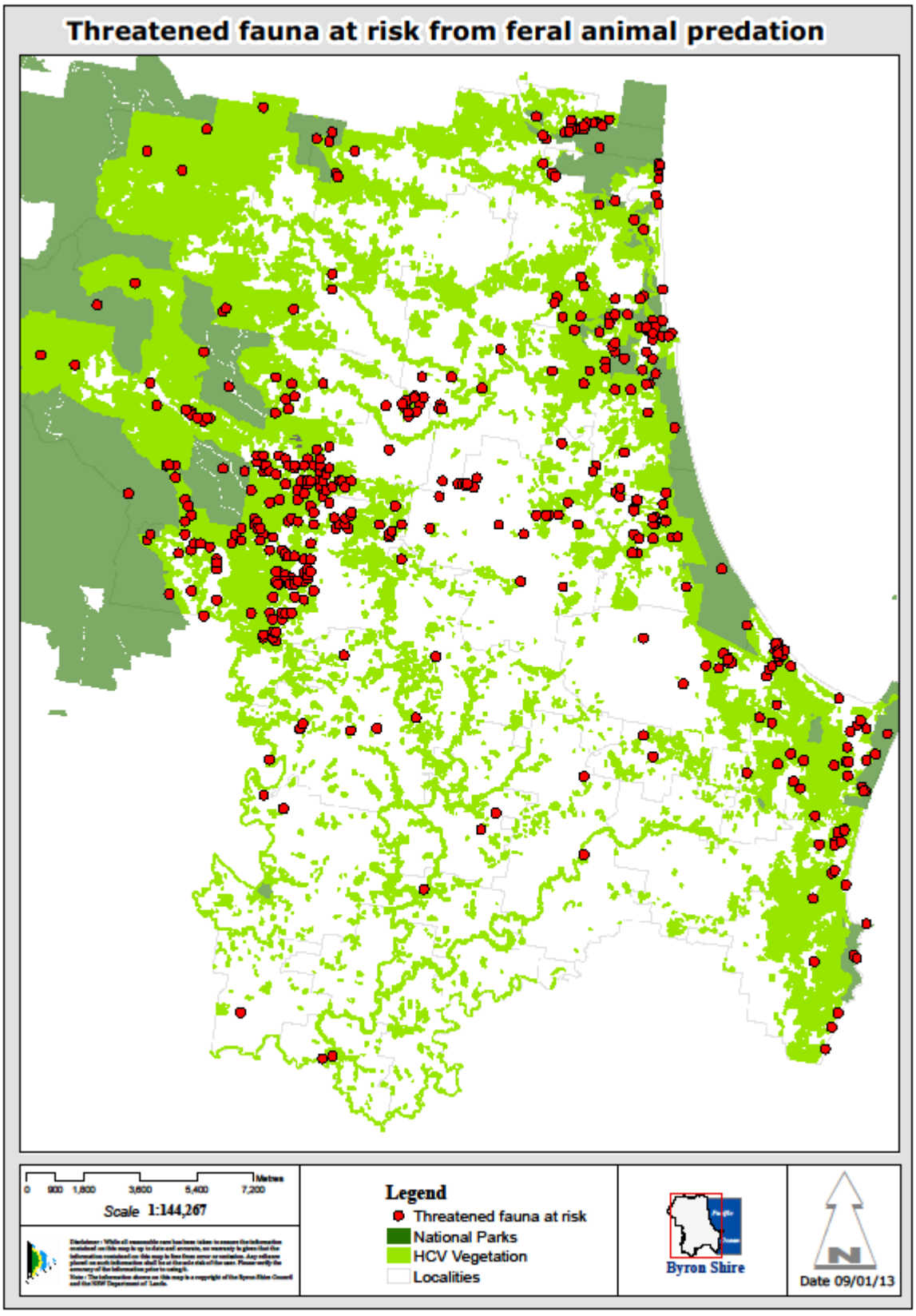
V - Vulnerable

E1- Endangered

CE - Critically Endangered

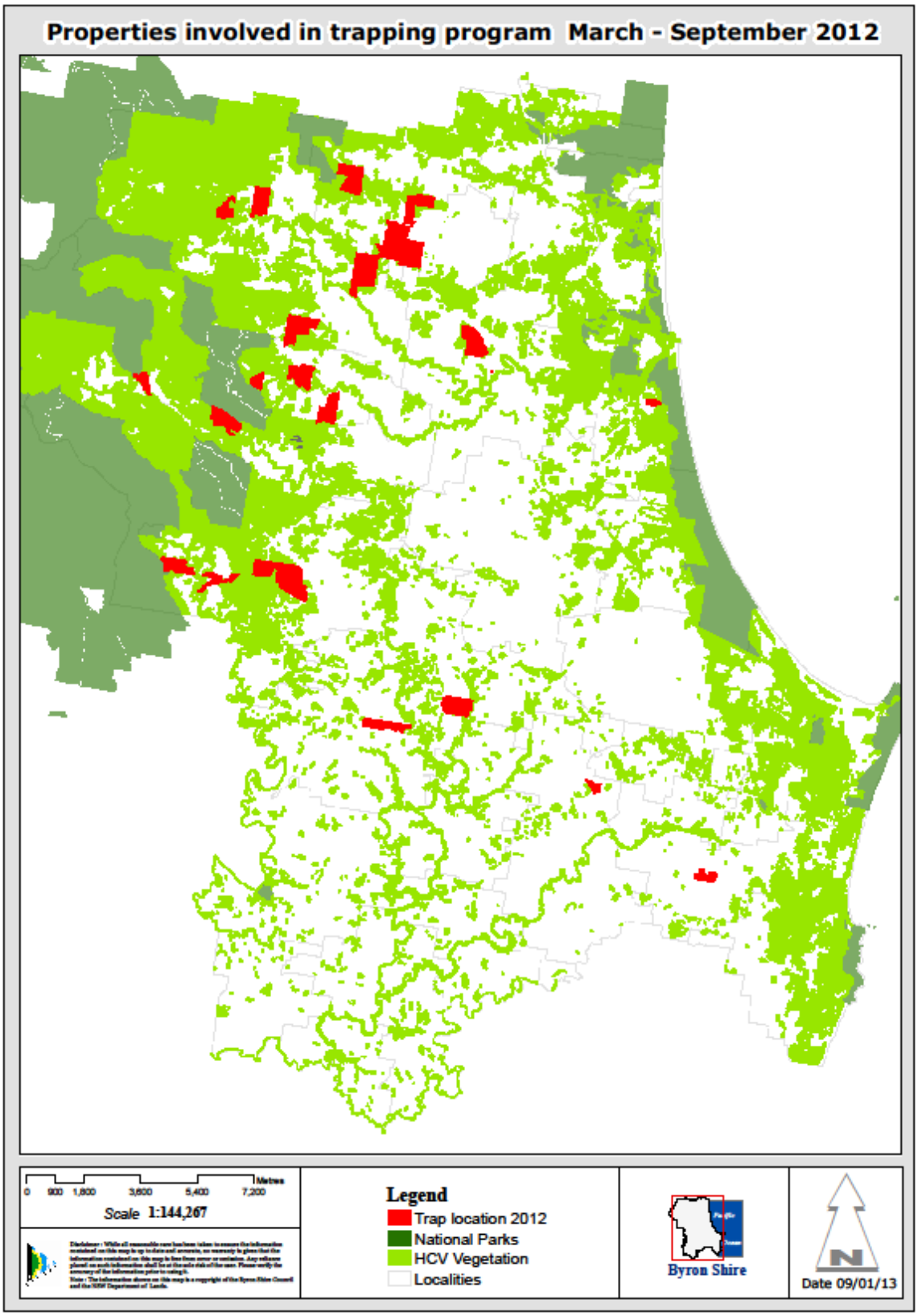
Source: Coutts Smith *et al* (2007), Atlas of NSW Wildlife (http://www.bionet.nsw.gov.au/), Department of Sustainability, Environment, Water, Population, and Communities (http://www.environment.gov.au/biodiversity/threatened/index.html)). Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions.

Appendix 2 Location of threatened fauna species at risk from feral animal predation in Byron Shire.



(Source: Byron Shire Council threatened species database)

Appendix 3 Location of properties involved in Council's feral animal trapping program in 2012.



Appendix 4 Risk Analysis
Adapted and modified from DEC 2006.

Risk	Likelihood	Consequence	Risk	Action
Non-target kill or injury to wildlife.	Possible	Moderate	High	• The Pesticide Control (1080 Liquid Concentrate and Bait Products) Order (PCO) 2010 and standard operating procedure DOG004 (SOP) describe the risk of 1080 ground baiting to native fauna and prescribes conditions and general restrictions on ground baiting so as to limit the risk associated with bait to the environment and native wildlife. All baiting will be carried out by trained persons in line with PCO and SOP. • The standard operation procedure DOG001 outlines the risk of trapping to wildlife and describes conditions and general restrictions on the use of padded jaw traps. All trapping will be carried out in line with the SOP. • Trapper will be appropriately experienced and licensed in undertaking trapping.
Non-target kill of domestic animals.	Possible	Moderate	High	• Wild dog and fox control programs are undertaken with the support of and coordination with the Livestock Health and Pest Authority and neighbours. All neighbours and occupiers within 1km of the baiting location will be notified to advise of the proposed 1080 baiting program. The Pesticide Control (1080 Liquid Concentrate and Bait Products) Order 2010 prescribes conditions to minimise risk to domestic animals and includes distance restrictions, public notification requirements and 1080 poisoning notice requirements. These conditions will be implemented to minimise the risk to domestic animals. • Properties neighbouring trapping sites should be notified. • Injured domestic dogs should be taken to the vet and when the identity of the owner has been establish they must be notified. • If trapper is in doubt about status of trapped dog it is to check with microchip scanner.

				• Uninjured domestic dogs caught should be taken to the Council pound.
Contamination of watercourses from 1080 baits	Unlikely	Minor	Low	• Baits will be air dried for 1-2 days to prevent seepage and as baits will be hand placed will not end up in watercourses. • The Pesticide Control (1080 Liquid Concentrate and Bait Products) Order 2010 prescribes conditions and general restrictions on ground baiting to minimise the risk to the environment and wildlife. These conditions will be implemented to minimise the risk of watercourse contamination.
Contamination of soil from 1080 leaching in the field	Rare	Insignificant	Low	• Baits will be air dried for 1-2 days to prevent seepage and 1080 is degraded rapidly by soil micro-organisms. • The Pesticide Control (1080 Liquid Concentrate and Bait Products) Order 2010 prescribes conditions and general restrictions on ground baiting and the risk to environment. These conditions will be implemented to minimise the risk of soil contamination.
Human poisoning from mixing and deploying baits	Rare	Major	High	• The Pesticide Control (1080 Liquid Concentrate and Bait Products) Order 2010 prescribes conditions and general restrictions on the use of 1080 baits so as to minimise the risk to humans. These conditions will be implemented to minimise the risk to humans, during the preparation and handling of 1080 poison baits.
Failure to impact on feral animals from as a result of the management program.	Possible	Moderate	High	• The Plan provides the techniques to enable monitoring of the feral animal impacts and will evaluate the effectiveness of the Plan. The Plan implementation will be reviewed and modified as required to optimise effectiveness.