



NSW NATIONAL PARKS & WILDLIFE SERVICE

Castlereagh, Agnes Banks and Windsor Downs Nature Reserves Draft Amendment to the Plan of Management

Return of threatened and declining species and
improving ecosystem health



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Have your say

Changes are proposed to the Castlereagh, Agnes Banks and Windsor Downs Nature Reserves Plan of Management to enable the return of locally extinct species, improved conservation for extant species and the restoration of ecosystem processes. This will be achieved through the creation of a feral predator-free area within either Castlereagh Nature Reserve or Windsor Downs Nature Reserve using conservation fencing. This will allow the eradication of feral predators and herbivores from within the fenced area and the reintroduction of a suite of native animals lost from the reserve since European settlement, with additional benefits for biodiversity and ecosystem health.

Changes are also proposed to enable an associated education centre to be constructed in either Castlereagh or Windsor Downs Nature Reserve to provide information to the community about the threatened native species that have been returned, the threat to our native fauna from feral cats and foxes, and the role of feral predator-free areas in helping us restore ecosystem function in NSW protected areas.

The Castlereagh, Agnes Banks and Windsor Downs Nature Reserves Plan of Management was adopted in 1999. Section 73B of the *National Parks and Wildlife Act 1974* enables the Minister to amend a plan of management.

We want to know what you think about this proposed amendment. To give us feedback, please send a written submission via:



the online submission form at www.environment.nsw.gov.au/get-involved/have-your-say



email to npws.parkplanning@environment.nsw.gov.au



post to: Manager Planning Evaluation and Assessment, Locked Bag 5022,
Parramatta NSW 2124.

Written submissions must be received by **8 March 2021**.

To help us make the best use of your feedback:

- Please tell us what issue or part of the amendment you are talking about. One way you can do this is to include the section heading and/or page number from the amendment in your submission.
- Tell us how we can make the amendment better. You may want to tell us what you know about the park or how you or other people use and value it.

We are happy to hear any ideas or comments and will consider them all, but please be aware that we can't always include all information or ideas in the final amendment.

What happens to your feedback?

Step 1: At the close of the public exhibition period, we consider all submissions and prepare a submissions report. Multiple submissions received by the same author will be counted as a single submission.

Step 2: We provide the relevant local advisory committee and the National Parks and Wildlife Advisory Council with the proposed amendment, all submissions and the submissions report. They consider the documents, make comments on the amendment or suggest changes, and provide advice to the Minister for Energy and Environment.

Step 3: The Minister considers the amendment, submissions and advice, makes any necessary changes and decides whether to adopt the amendment under the National Parks and Wildlife Act.

Your privacy

Your submission will be provided to two advisory bodies. Your comments on the draft plan may include personal information. The Department of Planning, Industry and Environment complies with the *NSW Privacy and Personal Information Protection Act 1998*, which regulates the collection, storage, quality, use and disclosure of personal information. For details see Privacy and security). Information that identifies you may be gathered when you use our website or send us an email.

If you indicate in your written submission that you object to your submission being made public, we will ask you before releasing your submission in response to any access applications under the *Government Information (Public Access) Act 2009*.

Why amend the plan?

Australia has the worst mammal extinction rate in the world, and many of our surviving small-medium sized mammals have suffered catastrophic declines in range and abundance. The loss of our small-medium sized mammals has been driven primarily by feral cats and foxes.

Feral cats are found throughout mainland Australia and kill 1.4 billion native animals every year. They have contributed to most of the small mammal extinctions in Australia over the last 250 years (Woinarski et al. 2018) and continue to have a significant impact on native mammals, reptiles and birds. In peri-urban areas pet cats kill on an estimated 241million native animals each year (Legge et al. 2020).

While Castlereagh, Agnes Banks and Windsor Downs nature reserves protect important remnants of the extensive open forests and woodlands that once covered the Cumberland Plain, the fauna of these reserves has been devastated. Many species are now locally extinct. Other species continue to occur but at very low densities and at high risk of extinction. For example, the southern brown bandicoot is locally extinct, the long-nosed bandicoot is either locally extinct or on the brink of local extinction. The species that have been lost played important ecosystem roles – for example, through turning over soil, spreading native seed and fungal spores, or as native predators.

The loss of native species diversity, and the dramatic decline in abundance of extant¹ native species, means the ecosystems at Castlereagh, Agnes Banks and Windsor Downs Nature Reserves are significantly diminished. Restoring these ecosystems through the reintroduction of lost fauna species is possible only by establishing a feral predator-free area using conservation fencing.

Establishment of a feral predator-free area within either Castlereagh Nature Reserve or Windsor Downs Nature Reserve is a critical step in restoring the ecosystems in this part of the Cumberland Plains. It will enable the return of native species previously lost from New South Wales, including either the eastern bettong or the brush-tailed bettong, and provide the community with the opportunity to experience Cumberland Plain woodland once again alive with native mammals.

¹ Still existing, not destroyed or lost

This will be achieved by identifying a suitable site within Castlereagh or Windsor Downs Nature Reserve, constructing a feral predator-proof fence, and then eradicating feral predators and herbivores from within the fenced area. The feral predator-proof fence will prevent cats and foxes from continually invading the nature reserve and regularly killing native animals.

Once the reserve is feral predator-free, a suite of now absent native animals that have been lost from the reserve will be reintroduced. The eradication of feral predators will also deliver a significant conservation benefit for extant species, such as the speckled warbler and other ground-nesting birds.

An education centre is also proposed to provide opportunities for visitors to learn about the important role that parks and feral predator-free areas play in protecting native wildlife, the impacts of feral predators on native animals, and the importance of management to control feral predators and herbivores to restore and protect habitat.

The current plan provides for controlling, and where practicable eliminating, pests in the nature reserves. This amendment is required to enable construction of feral predator-proof fencing, an education centre and new management trails as required to support the feral predator-free area.

Feral predator-free areas for wildlife across NSW

The proposed feral predator-free area is part of broader National Parks and Wildlife Service (NPWS) work which proposes the most significant threatened fauna restoration project in NSW history.

The initiative addresses the major risk to threatened mammals – predation by feral cats and foxes – by establishing a network of feral predator-free areas on national park estate. Establishment of these areas will enable reintroduction of locally extinct species (including threatened species) and deliver measurable conservation benefits for extant threatened species which, in turn, will help restore essential ecosystem processes.

In addition to the removal of feral predators and pests, other interventions such as active fire management, provision of nest boxes, and other habitat management measures will be used, as appropriate, to help re-establish and/or restore wild populations of target species.

The feral predator-free areas will operate as biodiversity anchors supporting broader landscape-scale conservation by:

- preventing the extinction of highly threatened species not expected to survive in the presence of feral cats and/or foxes
- providing secure long-term protection, and increasing the wild population of species suppressed by cats and/or foxes
- restoring ecological health through the restoration of ecosystem processes such as the return of digging mammals, the ecosystem engineers missing from our native landscapes
- generating knowledge through research and innovation which can be applied to mitigate the impact of feral predators and improve conservation outcomes ‘beyond the fence’
- establishing insurance populations of threatened species until effective landscape control of cats and foxes is developed
- providing source populations for the restoration of species across the landscape
- promoting public awareness of, and appreciation for, the value of native wildlife.

The proposed works will build on three existing feral predator-free areas in western NSW. Locally extinct mammals are being reintroduced in feral predator-free areas in Sturt and

Mallee Cliffs national parks and in Pilliga State Conservation Area following construction of feral predator-proof fences and removal of feral predators.

How to read the amendment

The proposed amendment, if adopted, would change the Castlereagh, Agnes Banks and Windsor Downs Nature Reserves Plan of Management and should be read in conjunction with the adopted plan.

Plans of management are available at: [Plans of management on the NSW Government's Environment website.](#)

Page number references in this document correspond to page numbers as they appear on the pages of the online PDF version of the adopted plan.

Proposed amendments

The Castlereagh, Agnes Banks and Windsor Downs Nature Reserves Plan of Management was adopted in 1999 (NPWS 1999). Below are the proposed amendments to the plan. Where a change is proposed to an action in the body of the plan, corresponding changes will be made to Section 5 'Plan Implementation' as required.

A review of environmental factors, which examines the potential impacts of the proposals on the environmental and cultural features of reserves and identifies mitigation measures, will be completed before any works are undertaken.

Amendment 1. Feral predator-free area, visitation and community education

The current plan of management directs that 'introduced species will be controlled, and where practicable eliminated from the reserves' and that priority will be given to controlling foxes and cats.

The current plan provides for independent or self-guided recreation, including walking, in all three reserves. It notes that Agnes Banks Nature Reserve is not suitable for cycling because the reserve comprises important relic sand dunes but provides for cycling on formed management trails in Windsor Downs and Castlereagh nature reserves, providing no unacceptable impacts occur.

The current plan also recognises the role community education programs play in protecting and managing the reserves.

Proposed changes

Feral predators have had a significant impact on Australian native animals. **Australia has the worst mammal extinction rate in the world.** Over 30 Australian mammal species have been driven to extinction in the past 250 years, with cats and foxes the main drivers for at least two-thirds of these losses (Legge et. al. 2018). Predation by cats and foxes has also led to declining populations and shrinking distributions of many surviving Australian native animals.

At Castlereagh and Windsor Downs Nature Reserves a range of small-medium sized animals are now thought to be locally extinct – these include the long-nosed bandicoot, eastern quoll and bush stone-curlew.

The effective control of cats and foxes is essential for the recovery of many of our threatened and declining native animals, especially small terrestrial mammals and ground-dwelling birds. Despite extensive and ongoing efforts, there is currently no effective strategy for landscape scale control of feral cats and landscape scale fox control has had mixed results.

Constructing feral predator-proof fencing and eradicating feral predators within the fenced area creates a feral predator-free area where native animals can be released, and healthy populations re-established. The establishment of feral predator-free areas is recognised as an essential component of an overall strategy to prevent further extinctions of predator-susceptible threatened mammals in the short to medium-term (e.g. Woinarski et. al. 2018).

Feral predator proof fencing will be constructed at Castlereagh or Windsor Downs Nature Reserve to facilitate the eradication of feral predators such as foxes, cats and wild dogs and pigs and deer and, to the extent feasible, rabbits.

The location of the feral predator-free area will be determined after detailed environmental assessment and the consideration of operational constraints. Supporting infrastructure may also be constructed if required for conservation purposes.

Where feasible, predator proof fencing will have vehicular access, for routine inspections and maintenance. Subject to the final route of the fence, new management trails may need to be constructed, or sections of existing trails realigned. In some circumstances existing trails that are no longer required for management purposes may be closed and, where appropriate, rehabilitated. New management trails may also be required within the feral predator-free area to facilitate predator control works, for monitoring of reintroduced species or for improved fire management capability.

Subject to appropriate planning and approvals, a wide range of native animals will be considered for release including brown antechinus, bush rat, common dunnart, eastern or brush-tailed bettong, eastern quoll, koala, new-holland mouse, long-nosed bandicoot, and green and golden bell frog. The removal of feral predators will also help to restore ecosystem function and benefit a range of extant fauna including several threatened bird species, microbats and the Cumberland Plain snail. Final selection of species for reintroduction will be made after scientific assessment and in accordance with a translocation proposal.

Once established the feral predator free area will provide a unique visitor opportunity to see the bush as it was before the arrival of feral animals – alive with small native mammals in a healthy ecosystem. Arrangements for access within the predator-free area will be developed once the area is feral predator-free and is likely to include organised nocturnal tours. Access will be restricted or not permitted during construction of the fenced area and eradication of feral predators, and at times when native species are being reintroduced/established.

A major benefit of the feral predator-free area will be the opportunity it provides to inform visitors about the natural values of the Cumberland Plain, its native animals, the threats posed by feral predators and other pests, and the importance of protecting remaining habitat. To realise this opportunity, an education centre will be constructed. The location of the education centre is yet to be finalised.

The education centre building will also house an area where equipment and materials required for the ongoing operation and maintenance of the feral predator-free area can be stored. Until the centre is built, equipment and materials will be housed in a temporary storage facility that may be constructed within the feral predator-free area.

Construction of facilities, including predator proof fencing, an education centre, any additional management trails and a temporary storage facility, may require clearing of native vegetation and disturbance of the soil present in the reserve. These actions will be subject to environmental assessment. Measures will be applied to limit the extent of site disturbance and minimise clearing of vegetation.

Unrelated to the feral predator-free proposal, in Agnes Banks Nature Reserve an existing walking track, the Cottage Loop Track, is identified. Several additional management trails in Agnes Banks Nature Reserve (see Amendment 3) also provide opportunities for walkers.

Section 2.2.2 Importance of Castlereagh, Agnes Banks and Windsor Downs

*Plan reference: pages 5–6, under **Natural heritage conservation***

Replace the third sentence of the third paragraph:

Each nature reserve protects different plant species and associations including a number of threatened and poorly conserved species and regionally rare forest associations.

With:

Each nature reserve protects different plant species and associations including threatened ecological communities and threatened and poorly conserved native plants.

Replace the fourth and fifth paragraphs:

Parts of Castlereagh Nature Reserve and Windsor Downs Nature Reserve support Cumberland Plain Woodland vegetation, a community which has been listed as an Endangered Ecological Community under the *Threatened Species Conservation Act 1995*.

The rarity of the Cumberland Plain woodland vegetation found in Windsor Downs Nature Reserve and Castlereagh Nature Reserve, and associated rare plants, resulted in both these areas being listed on the Australian Heritage Commission's Register of the National Estate.

With:

Given the extensive clearing of vegetation already undertaken across the Cumberland Plain and the continuing clearing for urban development, most of its vegetation communities, including the vegetation communities of the reserves, have been listed as threatened ecological communities under the *Biodiversity Conservation Act 2016*. Threatened ecological communities present in the reserves include Cooks River/Castlereagh Ironbark Forest, Castlereagh Scribbly Gum Woodland, Shale Gravel Transition Forest, Castlereagh Swamp Woodland, Agnes Banks Woodland and Cumberland Plain Woodland.

Add new final paragraphs:

Introduced pests, especially feral predators such as cats and foxes, have had a significant impact on Australian native animals, including those present on the Cumberland Plain. Many fauna species that were once found within the reserves are now locally extinct while others are threatened or less abundant.

Creating a feral predator-proof area will enable reintroduction of a range of locally extinct, rare and/or declining native animals into the reserve. It will also enhance protection and increase populations of existing native animal species within the reserve that are being suppressed by cats and foxes. Reintroduction of native animals, including those that previously occurred or were once more widespread on the Cumberland Plain, is expected to support ecological restoration.

*Plan reference: page 7, under **Education and scientific use***

Add a new third paragraph:

Creating a feral predator-free area will present an opportunity to increase public understanding of the threats to native mammals from feral predators, the high rates of native animal extinction in New South Wales and Australia, and the importance of these missing species to ecosystem function. It will also allow visitors to experience native fauna in a natural area in a way that has not been possible in New South Wales for more than 100 years.

Section 3.2 Specific objectives for Castlereagh, Agnes Banks and Windsor Downs Nature Reserves

Plan reference: page 8

Add a new specific objective:

protection and enhancement of native animals in Castlereagh or Windsor Downs Nature Reserve, including through construction of feral predator-proof fencing; eradication of feral predators; improved control, and where possible eradication, of other feral pests and reintroduction of select native animals within the feral predator-free area;

Section 3.3 Overall strategy

Plan reference: page 8

Replace the second sentence:

Priority will be placed on protection of the dunes and other vegetation communities within Agnes Banks Nature Reserve from uncontrolled access, reduction of the number of management trails in Castlereagh Nature Reserve, and reduction of impacts on Windsor Downs Nature Reserve from neighbouring developments and associated users.

With:

Priority will be placed on protection of the dunes and other vegetation communities within Agnes Banks Nature Reserve from uncontrolled access, creation of a feral predator-free area, and reduction of impacts on Windsor Downs Nature Reserve from neighbouring developments and associated users.

Section 4.1.1 Geology, landform and soils

*Plan reference: page 11, under **Policies***

Replace the second policy:

Features and sites of geological, geomorphological and/or pedological significance will be protected from disturbance. These include the Agnes Banks dunes, the undisturbed gravels in Castlereagh Nature Reserve and the shale levee in Windsor Downs Nature Reserve.

With:

Features and sites of geological, geomorphological and/or pedological significance will be protected from disturbance wherever possible. These include the Agnes Banks dunes, the undisturbed gravels in Castlereagh Nature Reserve and the shale levee in Windsor Downs Nature Reserve.

Section 4.1.2 Native plants and animals

Delete the following introductory paragraphs:

Castlereagh, Agnes Banks and Windsor Downs Nature Reserves contain a range of native plant and animal associations of the Cumberland Plain. Whilst the nature reserves are in close proximity to each other, the occurrence of different soils in each reserve has resulted in vegetation associations and associated animal populations that differ markedly from each other. They also contain a number of threatened and poorly conserved species.

Under the Threatened Species Conservation Act a recovery plan and/or threat abatement plan must be prepared for endangered and vulnerable plants and animals. The purpose of a recovery plan is to promote the recovery of a threatened species, population or ecological community to a position of viability in nature. A

threat abatement plan outlines the management of key threatening processes with a view to their abatement, amelioration or elimination.

The relatively small size of each nature reserve and their proximity to urban and semi-urban areas makes it important to establish and maintain wildlife corridors linking them to other naturally vegetated areas. Whilst the nature reserves may be able to support viable and diverse native plant and animal populations in isolation to each other, wildlife corridors provide key habitat in addition to the reserves and a mechanism for native plant and animal movement.

Replace introductory paragraphs with:

Castlereagh, Agnes Banks and Windsor Downs Nature Reserves contain a range of native plant and animal associations of the Cumberland Plain. Whilst the nature reserves are in close proximity to each other, the occurrence of different soils in each reserve has resulted in vegetation associations and associated animal populations that differ markedly from each other. They also contain a number of threatened and poorly conserved species. Almost all vegetation communities within the nature reserves are listed as threatened ecological communities under the Biodiversity Conservation Act.

However, the health of these ecological communities in each reserve is significantly impaired by the ongoing impact of feral animals. For example, a very high proportion of the small-medium sized mammal fauna that once occurred in each reserve is now locally extinct or occurs only at very low levels. The loss of these species – and the ecosystem processes which they contributed to – has significantly reduced the ecological health of each reserve.

The relatively small size of each nature reserve and their proximity to urban and semi-urban areas makes it important to establish and maintain corridors linking them to other naturally vegetated areas to the extent feasible. However, it is expected that ongoing urban development and transport upgrades will continue to limit the extent to which each reserve can be connected effectively to other areas of native vegetation. Maintaining connectivity alone will not be sufficient to enable the return of locally extinct fauna, and nor will it enable the restoration of extant fauna and flora affected by the ongoing impact of feral animals. Accordingly, active management intervention within each reserve – including the exclusion of feral animals - is essential if biodiversity values are to be maintained and restored over time.

A feral predator-free area will be established in Castlereagh or Windsor Downs Nature Reserve to enable reintroduction of a range of native animals and improve ecosystem function.

The project will involve construction of feral predator-proof fencing to facilitate the eradication of predators such as foxes, cats and wild dogs as well as other pests including pigs and deer. Rabbits will also be controlled to the greatest extent possible. Selection of the final location of the feral predator-free area will be subject to environmental assessment and approval, and operational constraints.

As well as facilitating the reintroduction of select native animals, the construction of predator proof fencing and the eradication of feral predators and feral herbivores (if not eradicated, rabbits will be reduced to levels that are not ecologically significant) will help restore ecosystem function. This will improve conditions for threatened ecological communities and for extant native plants and animals, including several threatened birds and microbats and the Cumberland Plain land snail.

Monitoring will be undertaken to quantify the benefits of the feral predator-free area, to enable assessments of ecosystem health and to inform ongoing management

decisions. For example, populations of reintroduced and extant animals will be monitored, as will threats and a range of other ecological indicators.

The feral predator-free area provides a significant opportunity to inform visitors about native animals, the impacts of feral predators and other pests on native animals, and the importance of management to control feral predators and other pests and protect remaining habitat fragments. To realise this opportunity, an education centre will be constructed.

While the infrastructure required to create and maintain the feral predator-free area will require some clearing and site disturbance, all works will be subject to environmental impact assessment. The creation and maintenance of a feral predator-free area will improve biodiversity and is designed to help restore ecosystem function.

*Plan reference: pages 12-13, under **Castlereagh Nature Reserve***

Replace the first paragraph:

A number of vegetation surveys have been undertaken in the area. One study (Benson, Coveny and Hind, 1984) identified two principal vegetation formations: open-forest and low woodland.

With:

A number of vegetation surveys have been undertaken in the area (for example, Benson et. al. 1984, NPWS 2002). These have identified two broad vegetation formations: open forest and low woodland.

Replace the second paragraph:

Open-forest occurs on clay soils and is dominated by broad-leaved ironbark *Eucalyptus fibrosa* ssp. *fibrosa* with occasional mugga ironbark *Eucalyptus sideroxylon*, thin-leaved stringybark *Eucalyptus eugenioides* and woollybutt *Eucalyptus longifolia*. There is a diverse shrubby understorey including *Pultenaea ulicifolia*, *Pultenaea violacea*, *Allocasuarina littoralis* and numerous forbs and grasses.

With:

The open forest community is part of the threatened ecological community Cooks River/Castlereagh Ironbark Forest, listed as endangered under the Biodiversity Conservation Act. This community is dominated by broad-leaved ironbark *Eucalyptus fibrosa*, with occasional mugga ironbark *Eucalyptus sideroxylon* and woollybutt *Eucalyptus longifolia*. A small tree layer of white feather honey myrtle *Melaleuca decora* is common. A relatively dense shrub stratum is dominated by prickly-leaved paperbark *Melaleuca nodosa* and peach heath *Lissanthe strigosa*. A variety of other shrubs also occur, including downy wattle *Acacia pubescens*, *Dillwynia tenuifolia*, gorse bitter pea *Daviesia ulicifolia*, Sydney bush-pea *Pultenaea parviflora*, hairy bush-pea *Pultenaea villosa*, *Micromyrtus minutiflora* and *Grevillea juniperina* subsp. *juniperina*. Commonly occurring species within the relatively sparse ground stratum include wiry panic *Entolasia stricta*, *Lepidosperma laterale*, *Opercularia diphylla*, blue flax-lily *Dianella revoluta*, kangaroo grass *Themeda triandra*, weeping grass *Microlaena stipoides* var. *stipoides* and white root *Lobelia purpurascens*. Cooks River/Castlereagh Ironbark Forest primarily occurs on clay soils derived from Tertiary alluvium.

Replace the third paragraph:

Low woodland covers the remaining area and is dominated by stringybark *Eucalyptus haemastoma* and narrow-leaved apple *Angophora bakeri*. The low woodland has a similar understorey to that which occurs in the open forest within the reserve.

With:

The low woodland community is part of the threatened ecological community Castlereagh Scribbly Gum Woodland, listed as vulnerable under the Biodiversity Conservation Act. This community is dominated by Parramatta redgum *Eucalyptus parramattensis* subsp. *parramattensis*, narrow-leaved apple *Angophora bakeri* and scribbly gum *Eucalyptus sclerophylla*, often with a small tree layer of white feather honey myrtle *Melaleuca decora*. Its well-developed shrub stratum is diverse and includes species such as hairpin banksia *Banksia spinulosa*, prickly-leaved paperbark *Melaleuca nodosa*, thyme honey-myrtle *Melaleuca thymifolia*, needlebush *Hakea sericea* and broad-leaved hakea *Hakea dactyloides*. The ground stratum contains a diverse range of grasses and forbs including kangaroo grass *Themeda triandra*, wiry panic *Entolasia stricta*, *Cyathochaeta diandra*, blue flax-lily *Dianella revoluta*, grass trigger-plant *Stylidium graminifolium*, *Platysace ericoides*, slender wire lily *Laxmannia gracilis* and *Aristida warburgii*. Castlereagh Scribbly Gum Woodland is most often found on sandy soils.

Add a new fourth paragraph:

Castlereagh Nature Reserve also protects fragments of two other endangered ecological communities - Castlereagh Swamp Woodland and Shale Gravel Transition Forest.

Replace the last sentence in the sixth paragraph:

Part of the reserve is listed on the register of the National Estate as habitat for jewel beetle *Stigmodera (Castiarina) flavovaria* and over 135 species of birds have also been recorded in the reserve.

With:

The reserve provides habitat for jewel beetle *Castiarina flavopicta* and over 135 species of birds have also been recorded in the reserve.

*Plan reference: pages 15–16, under **Policies***

Replace the first dot point of the first policy:

maintain natural biodiversity

With:

maintain or improve biodiversity

Add a new second policy:

Reintroduction of native animals will be undertaken in accordance with all relevant permits and approvals

*Plan reference: page 16, under **Actions***

Add a new high priority action:

Improve biodiversity through construction of a feral predator-proof fence in either Castlereagh or Windsor Downs Nature Reserves, eradication of feral predators, the reintroduction of native animals, the restoration of extant populations of fauna that have been suppressed by cats and foxes and the restoration of vegetation that has been impacted by feral herbivores.

Section 4.1.3 Introduced plants and animals

*Plan reference: page 17, under **Introduced animals***

Replace the second paragraph:

Introduced animals can compete with and prey on native plant and animal species. Evidence of introduced species include scats, diggings and disturbed vegetation which not only affects native species, it detracts from the experience when visiting natural areas. Cats and dogs are generally domestic animals entering the reserve from the neighbourhood or are abandoned in or adjacent to the reserves. The responsibility is vested in the owner for the effective control and management of domestic dogs and cats.

With:

Pest animals compete with and prey on native plants and animals. Feral predators have had a devastating impact on Australian native animals, many of which, particularly Australian small-medium sized mammals, are highly susceptible to predation by cats and foxes. Since 1788, predation by cats and foxes has played a role in the extinction of at least 34 Australian mammals. Predation by cats and foxes has also led to population declines and reduced the distribution of many surviving Australian native animals.

Feral predator-proof fencing will be constructed in either Castlereagh or Windsor Downs to facilitate eradication of feral predators, prevent future invasion of cats, foxes and dogs into the reserve and allow the reintroduction of native animals, including those that previously occurred, or were once more widespread, on the Cumberland Plain. The feral-free area will boost extant fauna and improve ecosystem health.

The exact location of the feral predator-free area will be determined by operational constraints and refined through a consideration of environmental and heritage impacts.

Ongoing and intensive pest control work will occur within the feral predator-free area. Feral predators such as cats and foxes will be eradicated.

Perimeter trails will be constructed alongside the fences, as far as practicable, to enable access to the fences for regular patrols to assess their integrity and undertake maintenance.

*Plan reference: page 17, under **Policies***

Replace the first policy:

Introduced species in Castlereagh, Agnes Banks and Windsor Downs Nature Reserves will be controlled, and where practicable eliminated.

With:

Pest species in Castlereagh, Agnes Banks and Windsor Downs Nature Reserves will be controlled, and where practicable eliminated. Feral predator-proof fencing will facilitate eradication of feral predators and feral herbivores (if eradication of rabbits is not feasible, they will be reduced to a level that is not ecologically significant).

Delete the third policy:

Control strategies will as far as possible be species specific and have minimal impact on biological diversity, neighbouring landholders and reserve visitors.

*Plan reference: page 17, under **Actions***

Add a new high priority action:

Construct feral predator-proof fencing to create a feral predator-free area. Eradicate feral predators and reintroduce a range of native animals, including those that previously occurred or were once more widespread on the Cumberland Plain, to help restore ecosystem function. (see also 4.1.2).

Section 4.2.1 Environmental education, interpretation and public use

Plan reference: pages 25-26

Replace the second last paragraph:

Castlereagh and Windsor Downs Nature Reserves are popular with local children for bicycle riding. Bicycle riding can pose a threat to the public safety and cause soil erosion and vegetation loss when undertaken off trails. The flat terrain and predominantly clay and gravel soils in Castlereagh and Windsor Downs Nature Reserves mean that cycling may be acceptable in these reserves if it is restricted to formed trails. Agnes Banks Nature Reserve, in contrast, comprises scientifically important relic sand dunes which have high erosion potential and is unsuitable for bicycle riding.

With:

Cycling will not be allowed within the feral predator free area or Agnes Banks Nature Reserve. Elsewhere, cycling will be allowed on formed trails in accordance with NPWS signs.

Replace the last paragraph:

Prominent and active community education programs are key management activities that assist the protection and management of the reserves. Existing interpretation material includes information brochures for Castlereagh and Windsor Downs Nature Reserves. These reserves also have prominent signs at public entrances and on public road boundaries. Agnes Banks Nature Reserve does not have an information brochure and has no on-site interpretation.

With:

Prominent and active community education programs are key management activities that assist the protection and management of the reserves. An education centre will be constructed in association with the feral predator-free area to provide visitors with information about Australian native animals, the impacts of vertebrate pests on their populations, the importance of protecting remaining habitat fragments and the role played by feral predator-free areas. The education centre will also act as a hub or a meeting point for organised visits. It will also have a separate section, closed to the public, to provide operational support to the feral predator-free area (see also Section 4.2.3).

NPWS plans to operate the education centre initially but will investigate the potential for an external partner to run the education centre in partnership with NPWS in the future.

*Plan reference: pages 26-27, under **Policies***

Add three new policies:

Castlereagh, Agnes Banks and Windsor Downs Nature Reserves primarily provide for the conservation of biodiversity, the maintenance of ecosystem function, the conservation of cultural heritage and education, research and monitoring.

Information about native animals, the impacts of pests and the importance of management, including creating feral predator-free areas, will be available to the community at the education centre.

Access in the feral predator-free area for self-guided visitors may be restricted during certain hours (e.g. between dusk and dawn) or at other times to accommodate essential management operations. Managed public access (e.g. between dusk and dawn) will be provided through organised visitor activities - for example, guided nocturnal tours.

Replace the current second policy:

Walking and bicycle riding will be permitted in the reserves providing visitors keep to formed management trails and no unacceptable impacts occur.

With:

Walking will be permitted on management trails in the reserves and on the Cottage Loop Track in Agnes Banks Nature Reserve. Cycling will not be allowed within the feral predator free area or Agnes Banks Nature Reserve.

Add a new dot point to the last policy about interpretation of the reserves:

the role of the feral predator-free area in restoring ecosystem function;

*Plan reference: page 27, under **Actions***

Add three new medium priority actions:

Build an education centre to provide information to visitors and to house NPWS operations supporting the feral predator-free area.

Consider, and if appropriate, enter into leasing or licensing arrangements for the education centre for purposes including education, interpretation and display.

Construct low-impact infrastructure, such as observation hides, elevated viewing platforms and walking tracks, as required to facilitate visitors, staff, researchers and other authorised persons viewing and studying wildlife within the feral predator-free area. Any new infrastructure will be subject to environmental impact assessment and relevant approvals.

Section 4.2.2 Research

Plan reference: page 28

Add a new second sentence to the first paragraph:

Targeted research and monitoring of feral predator control and reintroduction of native animals will be vital to inform future management of the feral predator-free program.

*Plan reference: page 28, under **Policies***

Add a new first dot point to the first policy about priorities for research and monitoring:

the effect on ecological health of establishing a feral predator-free area and reintroducing locally extinct species and restoring populations of extant species;

*Plan reference: page 28, under **Actions***

Add a new high priority action:

Actively pursue partnerships with appropriate institutions to assist with and/or undertake long term research and monitoring projects in the reserves, with a focus on the feral predator-free area.

Section 4.2.3 Management operations

*Plan reference: page 30, under **Policies***

Add a new policy:

New management trails may be constructed, and existing management trails realigned, to support the feral predator-free area.

*Plan reference: pages 30–31, under **Actions***

Replace:

The need for Llandilo Trail within Castlereagh Nature Reserve and the Dip Trail within Windsor Downs Nature Reserve to be retained as management trails will be reviewed.

With:

The need for the Dip Trail within Windsor Downs Nature Reserve to be retained as a management trail will be reviewed.

Add two new high priority actions:

Construct new management trails and realign existing management trails as necessary to support the feral predator-free area, including for maintaining fencelines, facilitating pest control, monitoring of reintroduced animals or protecting the feral predator-free area from fire. Trail location, design and construction will require environmental impact assessment and relevant approvals.

Establish a temporary storage facility within the feral predator-free area to support operation and maintenance of fences and the feral predator-free area. Once this support can be provided at the education centre building or within its grounds, consider closing and removing the temporary storage facility.

Section 6 Selected references

Plan reference: page 35

Add a new reference:

NPWS 2002, Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney, Final Edition, NPWS, Sydney.

Amendment 2. Fire management

The current plan of management includes details about fire management that have been superseded by the reserve fire management strategies (OEH 2016 a, b & c).

Proposed changes

Consistent with the NPWS statewide approach, fire management for each reserve is outlined in a detailed fire management strategy rather than in a plan of management.

The amendment removes detailed fire management planning from the plan of management and identifies the fire management strategy for each reserve.

The construction of new or improved assets, including predator proof fencing and an education centre, and increased biodiversity values following reintroductions of native animals may require changes to the fire management approach.

Section 4.1.4 Fire Management

Plan reference: pages 18-21

Replace Section 4.1.4 Fire management (the entire section) with new text:

The primary objectives of NPWS fire management are to protect life, property, community assets and natural and cultural heritage from the adverse impacts of fire, while also managing fire regimes in parks to maintain and enhance biodiversity. NPWS also assists in developing fire management practices that contribute to conserving biodiversity and cultural heritage across the landscape and implements cooperative and coordinated fire management arrangements with other fire authorities, neighbours and the community (OEH 2013a).

Fire is a natural feature of many environments and is essential for the survival of some plant communities. However, inappropriate fire regimes can lead to loss of particular plant and animal species and communities, and high frequency fires have been listed as a key threatening process under the Biodiversity Conservation Act (NSW SC 2000).

The reserves have a history of relatively frequent fire and, due to their relatively small size, some previous fires have burnt all, or nearly all, of each reserve. Fire management is critical to protect the natural and cultural heritage of the reserves from too frequent fire, to ensure that the entire reserve does not burn in a single fire event and to limit the spread of fire from the reserves to surrounding lands.

Fire management strategies that define the fire management approach for each of the reserves have been prepared (OEH 2016 a, b, c). The fire management strategies outline the recent fire history of the reserves, key assets within and adjoining the reserves including sites of natural and cultural heritage value, fire management zones and fire control advantages such as management trails and water supply points. They also contain fire regime guidelines for conservation of the reserve vegetation communities.

The fire management strategy for the feral predator-free area will be reviewed to ensure fencing and other infrastructure associated with the feral predator-free area are adequately protected from fire and that optimal fire regimes are identified for threatened ecological communities and native plants and animals present. The objectives of fire management will be to ensure the entire feral predator free does not burn in a single event, and to create a mosaic of different age since fire patches which both optimise ecological outcomes and help limit the biodiversity impact of any unplanned fires.

Castlereagh and Windsor Downs Nature Reserves are located adjacent to large areas of residential and rural residential lands. Agnes Banks Nature Reserve also has some rural

residential development adjacent to it. Strategic Fire Advantage Zones have been identified in Windsor Downs and Agnes Banks Nature Reserves. These zones are managed to maintain reduced fuel loads to help reduce fire intensity and protect residential and rural residential areas from wildfire. Prescribed burns have been undertaken across the reserves, including within Strategic Fire Advantage Zones to reduce fuel loads and better protect adjacent communities.

NPWS maintains cooperative arrangements with surrounding landowners and the Rural Fire Service (RFS) and is actively involved with the Cumberland Zone bush fire management committee. Cooperative arrangements include fire planning, fuel management and information sharing. Hazard reduction programs, ecological burning proposals and fire trail works are coordinated in conjunction with the bush fire management committee.

Policies

- Negative impacts of fire on life, property and the environment are minimised.
- The potential for spread of bushfires on, from, or into the park is minimised.
- Fire regimes are appropriate for conservation of native plant and animal communities.

Actions

- Implement the fire management strategies for the reserves and update as required.
- Continue to be involved in the Cumberland Zone bush fire management committee and maintain cooperative arrangements with local RFS brigades and surrounding landowners in regard to fuel management and fire suppression.
- Suppress unplanned fires in the reserves in line with the reserve fire management strategies.
- Manage the reserves to protect biodiversity in line with the reserve fire management strategies.

Selected References

Plan reference: page 35

Add the following five references cited in the new fire management text:

NSW SC 2000, *Final Determination to List High Frequency Fire Resulting in the Disruption of Life Cycle Processes in Plants and Animals and Loss of Vegetation Structure and Composition as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20014.

OEH 2013a, *Living with Fire in NSW National Parks: A strategy for managing bushfires in national parks and reserves 2012–2021*, revised edition, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/fire/120690livfire.htm.

OEH 2016a, Agnes Banks Nature Reserve Fire Management Strategy, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Fire-management-strategies/agnes-banks-nature-reserve-fire-management-strategy-160687.pdf.

OEH 2016b, Castlereagh Nature Reserve Fire Management Strategy, Office of Environment and Heritage, Sydney, <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Fire-management-strategies/castlereagh-nature-reserve-fire-management-strategy-160688.pdf>.

OEH 2016c, Windsor Downs Nature Reserve Fire Management Strategy, Office of Environment and Heritage, Sydney, <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Fire-management-strategies/windsor-downs-nature-reserve-fire-management-strategy-160689.pdf>.

Amendment 3. New maps

The current plan includes three A4 black and white maps – one map for each of the nature reserves covered by the plan. All three maps will be replaced and referred to as ‘figures’.

Proposed changes

New colour A4 maps for Castlereagh, Agnes Banks and Windsor Downs nature reserves show existing management trails that will be retained and maintained, and additions made to the reserves since the 1999 plan was adopted. The new map for Agnes Banks Nature Reserve will also show a walking track that occurs in the park.

Section 2.2.2 Location and Regional Setting

Plan reference: pages 3–5

Update the descriptions of Agnes Banks and Windsor Downs nature reserves to reflect additions made to those reserves since 1999.

Section 4.2.3 Management operations

Plan reference: pages 29–30, under Agnes Banks Nature Reserve

Replace the last sentences of the first paragraph:

Sandy Trail will be maintained and upgraded. Other trails will be closed and where necessary rehabilitated.

With

Sandy Trail and the other trails shown on Figure 1 will be retained and maintained as management trails. Other trails will be closed and where necessary rehabilitated.

Maps

Plan reference: multiple

Refer to new maps as figures throughout the plan, e.g. see Figure 1.

Plan reference: end pages

Replace the current black and white A4 maps of the three reserves

With: updated colour A4 maps (see Figures 1-3).

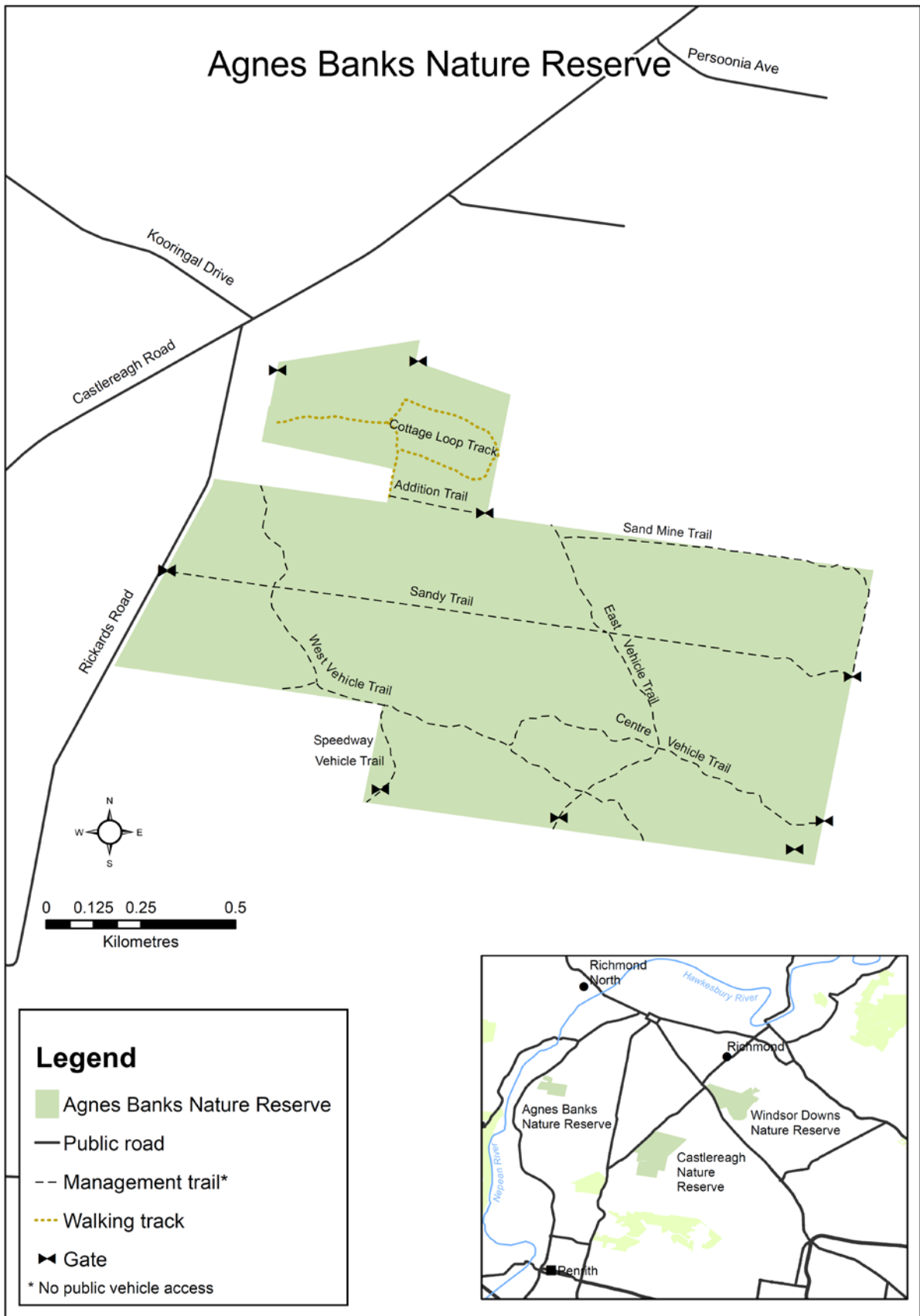


Figure 1 Revised plan of management map – Agnes Banks Nature Reserve

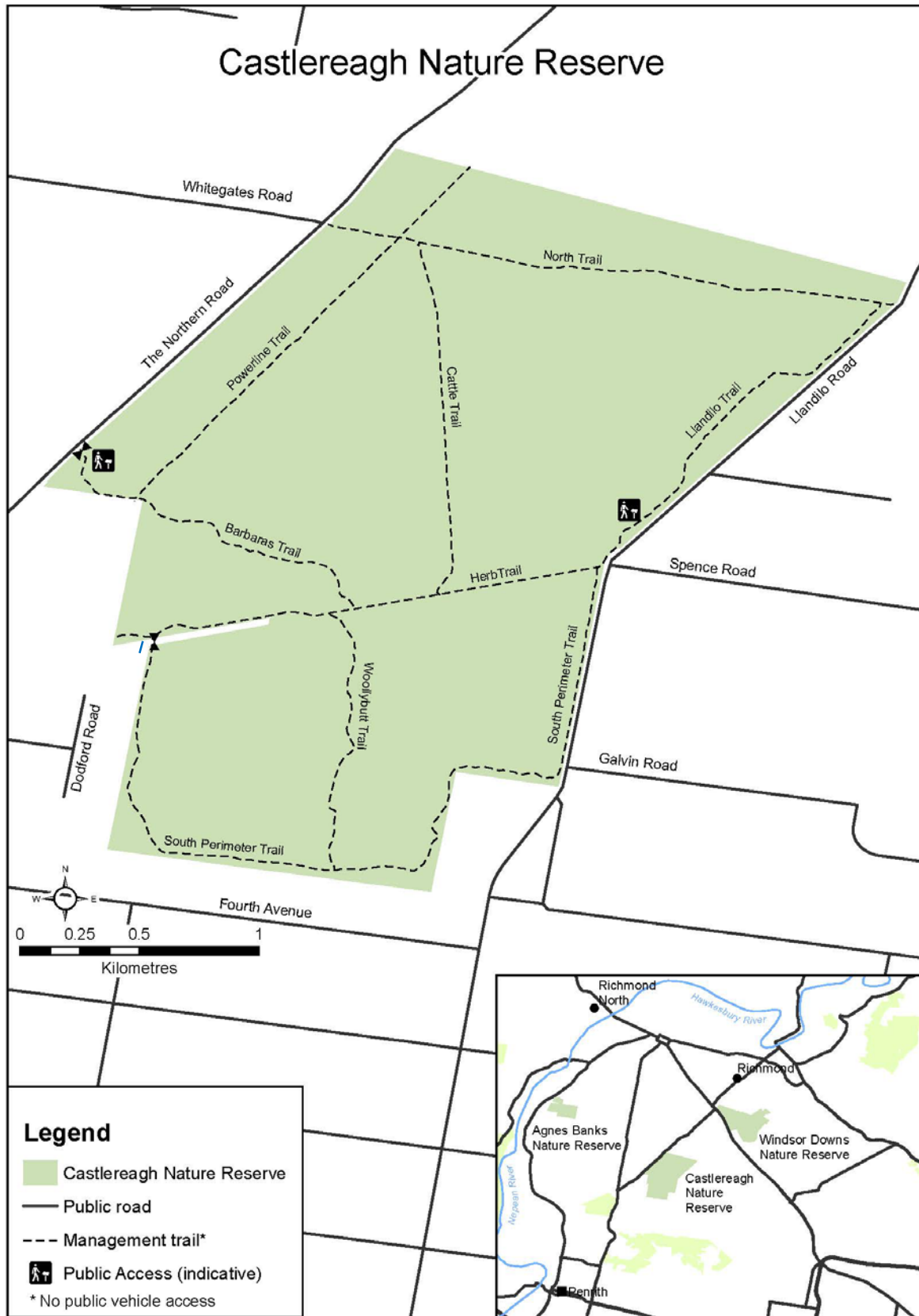


Figure 2 Revised plan of management map – Castlereagh Nature Reserve

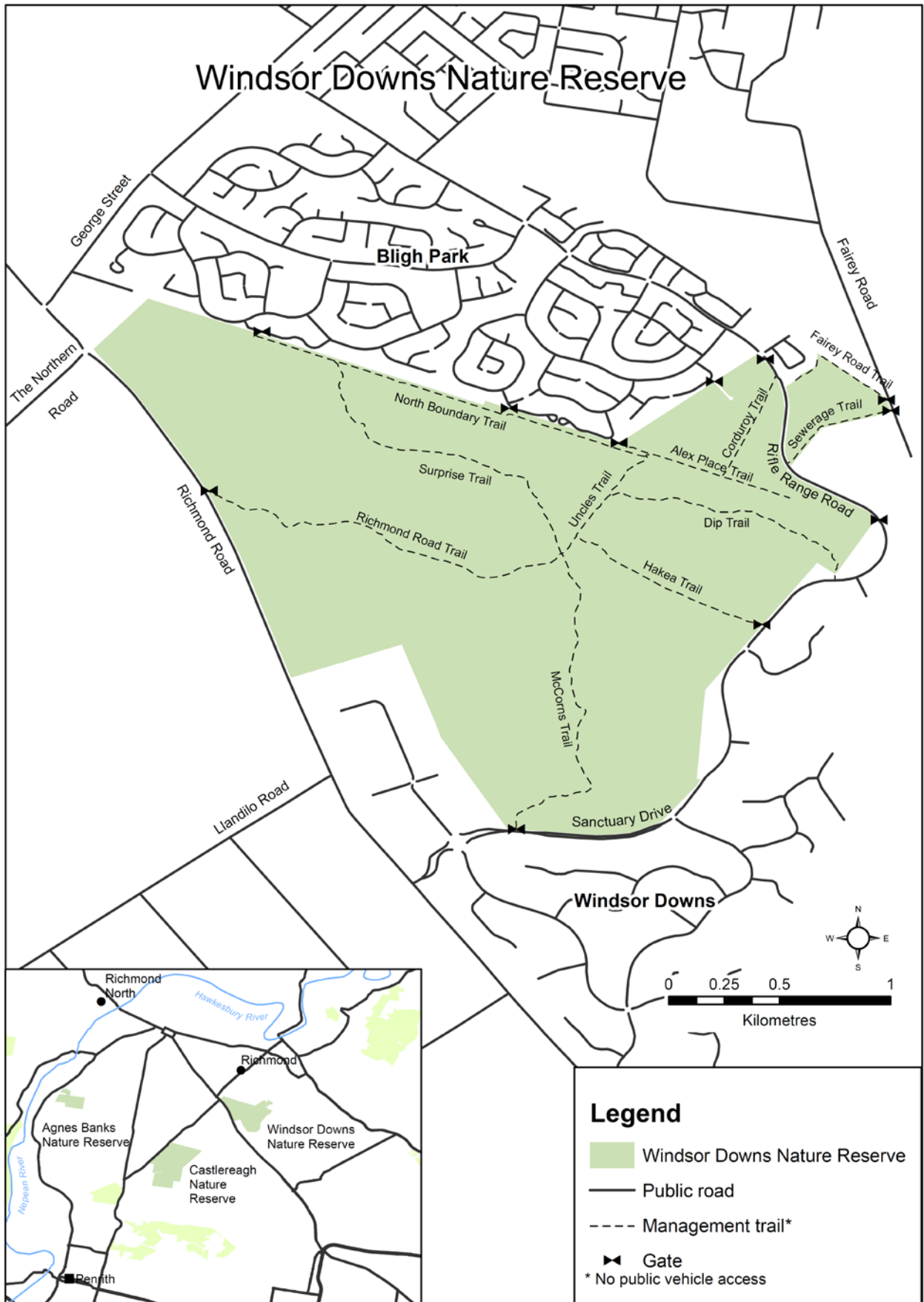


Figure 3 Revised plan of management map – Windsor Downs Nature Reserve

Amendment 4. Other changes

The current plan requires several other changes that are administrative changes. These additional changes are not directly related to the proposed creation of a feral predator-free area.

Proposed changes

The plan will be updated to reflect the fact that the *Biodiversity Conservation Act 2016* has replaced the *Threatened Species Conservation Act 1995*.

Following the creation of the Biodiversity Conservation Act, management of threatened species, communities and key threatening processes is now guided by the *Biodiversity Conservation Program* and the *Saving Our Species* program. Recovery plans and threat abatement plans are no longer prepared under the Biodiversity Conservation Act.

Several plants and animals have had their scientific and common names updated, misspellings corrected and/or their status under the Biodiversity Conservation Act updated.

References to the Noxious Weeds Act and to noxious weeds have been deleted as that act has been repealed.

The contact details for managers of the reserves will be updated and the plan will identify that, should operations be proposed that are not consistent with the plan, an amendment to the plan is required to enable those operations.

Forewords are no longer published in NPWS plans of management. The foreword dating from adoption of the original plan will not form part of the republished amended plan.

The current plan identifies that some lands in Agnes Banks Nature Reserve and on adjacent private property are covered by a Permanent Conservation Order under the Heritage Act. Changes to the Heritage Act in 1999 led to the creation of the State Heritage Register. Places formerly covered by Permanent Conservation Orders are now listed on the State Heritage Register. The State Heritage Register listing continues to apply to parts of Agnes Banks Nature Reserve and to a small area of adjacent private property.

Throughout the plan

Replace Threatened Species Conservation Act with Biodiversity Conservation Act wherever it occurs throughout the plan.

Correct spelling errors of scientific names and **update** status of threatened species as required throughout the plan.

Foreword

Delete the Foreword.

Section 1 Introduction

Plan reference: page 1

Add a new last sentence to the third paragraph:

Should operations be proposed in future that are not consistent with this plan, an amendment to the plan will be required.

Replace the last paragraph:

Additional information or enquires about the nature reserves or this plan of management may be obtained from the Service's Hills Sub-District Office, which is located in Scheyville National Park, or by telephone on (045) 723 100.

With:

Additional information or enquires about the nature reserves or this plan of management may be obtained from the NPWS Cumberland Area Office, which is located in Scheyville National Park, or by telephone on 4580 2706.

Section 2.2.1 Location and regional context

*Plan reference: page 4, under **Agnes Banks Nature Reserve***

Add two new sentences:

Additions to the reserve were made in 1995 and 2006. Part of these additions, and some adjacent private property, is listed on the State Heritage Register for its environmental heritage with natural, scientific and aesthetic significance.

Section 4.1.2 Native plants and animals

Plan reference: page 12

Replace the second paragraph:

Under the Threatened Species Conservation Act a recovery plan and/or threat abatement plan must be prepared for endangered and vulnerable plants and animals. The purpose of a recovery plan is to promote the recovery of a threatened species, population or ecological community to a position of viability in nature. A threat abatement plan outlines the management of key threatening processes with a view to their abatement, amelioration or elimination.

With:

Key strategies for the recovery of threatened species, populations and ecological communities are set out in a statewide Biodiversity Conservation Program (OEH 2017). A range of actions are currently prioritised and implemented through the Saving our Species program, which aims to maximise the number of threatened species that can be secured in the wild in New South Wales for 100 years (OEH 2013b). Key threatening processes are also managed through a range of strategies including those developed under the Saving our Species program.

Individual recovery plans are prepared for nationally listed threatened species and some recovery plans were previously prepared for some species and communities listed in New South Wales to consider management needs in more detail.

*Plan reference: pages 15–16, under **Policies***

Delete the second policy.

Section 4.2.3 Management operations

Plan reference: pages 28–29

Replace the second paragraph:

Castlereagh, Agnes Banks and Windsor Downs Nature Reserves are managed by the North Metropolitan District of the NSW National Parks and Wildlife Service.

Administration of the nature reserves is based at the Hills Sub-District Office in Scheyville National Park.

With:

Castlereagh, Agnes Banks and Windsor Downs Nature Reserves are managed by the NPWS Greater Sydney Park Operations Branch, Cumberland Area. Administration of the nature reserves is based at the Cumberland Area Office in Scheyville National Park.

Section 4.1.3 Introduced plants and animals

*Plan reference: pages 16-17, under **Introduced plants***

Replace the first paragraph:

Under the Noxious Weeds Act 1993, the Service is required to control noxious weeds to the extent necessary to restrict them from spreading to neighbouring properties. No noxious weeds have been recorded in the nature reserves. There are however, occurrences of African lovegrass *Eragrostis curvula* and whisky grass *Andropogon virginicus* along management trails and on the boundaries of the reserves.

With:

There are, for example, occurrences of African lovegrass *Eragrostis curvula* and whisky grass *Andropogon virginicus* along management trails and on the boundaries of the reserves.

Section 4.1.6 Historic heritage

*Plan reference: pages 23-24, under **Agnes Banks Nature Reserve***

Replace the final two sentences of the second paragraph:

Forty-two hectares, which included around 80% of the land covered by the order, was added to the nature reserve in 1995. The Order still applies over this land and a small area of private land adjoining the nature reserve.

With:

Forty-two hectares was added to the nature reserve in 1995, including around 36 hectares of land covered by the order. In 1999, changes to the Heritage Act led to the establishment of the State Heritage Register. Places formerly covered by Permanent Conservation Orders are now listed on the State Heritage Register.

In 2006 a further 16 hectares was added to the park, including two hectares covered by the listing. The State Heritage Register listing now covers some 38 hectares of the reserve and a small area of adjacent private land.

Selected References

Plan reference: page 35

Add the following references:

OEH 2013b, Saving our Species, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/savingourspecies/about.htm.

OEH 2017, Biodiversity Conservation Program, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/threatenedspecies/pas.htm.

References

Leary T and Kwok A 2007, A vertebrate fauna survey of Castlereagh Nature Reserve, unpublished report for NSW National Parks and Wildlife Service, Department of Environment and Climate Change.

Legge Sarah, Woinarski John C. Z., Dickman Chris R., Murphy Brett P., Woolley Leigh-Ann, Calver Mike C. 2020, We need to worry about Bella and Charlie: the impacts of pet cats on Australian wildlife. *Wildlife Research* **47**, 523-539.

Legge SM, Woinarski JCZ, Burbidge AA, Palmer A, Ringma J, Radford J, Mitchell N, Bode M, Wintle B, Baselar M, Bentley J, Copley P, Dexter N, Dickman CR, Gillespie G, Hill B, Johnson C, Latch P, Letnic M, Manning A, McCreless EE, Menkhorst P, Morris K, Moseby K, Page M, Pannell D, and Tuft 2018, Havens for threatened Australian mammals: the contributions of fenced areas and offshore islands to protecting mammal species that are susceptible to introduced predators, *Wildlife Research* 45, 627–644.

NPWS 1999, *Castlereagh, Agnes Banks and Windsor Downs Nature Reserves Plan of Management*, NSW National Parks and Wildlife Service, <https://www.environment.nsw.gov.au/research-and-publications/publications-search/castlereagh-agnes-banks-windsor-downs-nature-reserve-plan-of-management>.

OEH 2016a, *Agnes Banks Nature Reserve Fire Management Strategy*, Office of Environment and Heritage, <https://www.environment.nsw.gov.au/research-and-publications/publications-search/agnes-banks-nature-reserve-fire-management-strategy>.

OEH 2016b, *Castlereagh Nature Reserve Fire Management Strategy*, Office of Environment and Heritage, <https://www.environment.nsw.gov.au/research-and-publications/publications-search/castlereagh-nature-reserve-fire-management-strategy>.

OEH 2016c, *Windsor Downs Nature Reserve Fire Management Strategy*, Office of Environment and Heritage, <https://www.environment.nsw.gov.au/research-and-publications/publications-search/windsor-downs-nature-reserve-fire-management-strategy>.

Woinarski J, Wintle B, Kujala H, Keith H, Lindenmayer D, Legge S, Phillips B, Johnson C, Cadenhead N, Bode M, Bekessy S, Ringma J, Morgain R 2018, *Submission to the Senate Inquiry on Australia's faunal extinction crisis, The management and extent of the National Reserve System*, Submission 159, attachment 6 https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Faunalexinction/Submissions.