



MULLIGANS FLAT WOODLAND SANCTUARY CONCEPT PLAN

SEPTEMBER 2016



Acknowledgements

The Extended Mulligans Flat Sanctuary Concept Plan and Interpretation Strategy has been prepared by TRC Tourism, DSB and Locales for the ACT Parks and Conservation Service and the Woodlands and Wetlands Trust.

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Dams in the Sanctuary are a popular place for bird watching and viewing wildlife



SECTION 01
INTRODUCTION

Mulligans Flat Woodland Sanctuary: restoring our nature, transforming our thinking and inspiring action for conservation

BACKGROUND

Nestled on the edge of the ACT's expanding residential area the Mulligans Flat Woodland Sanctuary (MFWS) is one of Australia's most outstanding examples of woodland biodiversity conservation of national and local significance. The recently extended 1251 ha sanctuary is the largest most intact and contiguous area of the critically endangered Yellow Box–Blakely's Red Gum Grassy Woodland in public ownership in Australia and provides habitat for a number of threatened and rare plant and animal species. The long term aim of the MFWS is to restore the rich variety and abundance of woodland habitats and native wildlife that were present before European settlement.

A very significant feature of the MFWS is the absence of feral predators and herbivores in areas where a predator proof fence has been erected to provide protection. The fenced area provides a safe haven for the reintroduction of animal species that are locally extinct such as the Eastern Bettong, Bush Stone-curlew, New Holland Mouse and Eastern Quoll. The aim is to extend the predator proof fence to other parts of MFWS and expand the reintroduction program and woodland restoration activities.

The MFWS is managed by the Woodland and Wetlands Conservation Trust in partnership with the ACT Government. The ACT Parks and Conservation Service (PCS) provide the day to day management expertise needed for wildlife and nature reserve operations. The roles and responsibilities of each agency are set out in Appendix 1.

The MFWS hosts an internationally significant research program managed under the Mulligans Flat–Goorooyarroo Woodland Experiment, a partnership between The Australian National University, the ACT Government and CSIRO with assistance from other researchers and community groups. The aim of the project is to increase the level of understanding of woodland ecosystems and inform the development of reintroduction programs for animals known to have

occurred in the Canberra region, especially 'keystone' species that have a disproportionately large restorative effect on their environment. The experiment has focused on the establishment of a predator-proof fence in the original and smaller Mulligans Flat Woodland Reserve, as well as 94 experimental plots and associated monitoring to investigate the impact of management actions (including addition of logs, burning, exclusion of kangaroos and feral predators) to restore the structure and function of woodland ecosystems.

The MFWS is a large 'outdoor laboratory' offering opportunities to educate and inspire a new generation of residents, school children, university students, scientists, landholders, land managers about the restoration, conservation and management of box-gum woodlands—a major step forward for one of Australia's most threatened ecological communities.

PURPOSE OF THE CONCEPT PLAN

The primary purpose of the Mulligans Flat Woodland Sanctuary Concept Plan is to guide the protection of the natural, cultural values of MFWS into the future, while at the same time welcoming ACT residents, interstate and overseas visitors to experience for themselves a typical Australian box-gum grassy woodland habitat and its wildlife as it recovers from the impacts of farming and clearing.

It represents an important step in the planning, design and management of the MFWS and builds on the early planning and design strategies completed for the original Mulligans Flat Woodland Sanctuary prior to expansion. It sets the vision and overarching principles for management of the extended MFWS.

At the core of this concept plan is a very simple idea: the more people experience, connect with, and share their love for nature, the more support there will be for its conservation. The vision for the Sanctuary will be realised through the development of a range of appropriate experiences that connect visitors to the Sanctuary's values.

The plan provides visual representations of the MFWS's values, proposed management zones and infrastructure to support recreation and education to assist in planning and managing the MFWS.

The Concept Plan has been prepared concurrently with the Mulligans Flat Woodland Sanctuary Interpretation Plan. The concept plan includes an interpretive framework designed to engage visitors while communicating the key messages of the MFWS and its conservation and restoration projects. The interpretation framework is based around a set of interpretation principles that guide the development of any future project. They are general philosophical principles to follow when developing or assessing the interpretation design and content. Both plans should be read in conjunction with each other as the concepts are integrated across both plans.

OBJECTIVES OF THE CONCEPT PLAN

The objectives of the Concept Plan are to:

- Articulate a vision for the MFWS focused on the key themes of restoring, learning, and inspiring
- Summarise the values of the MFWS and the management obligations to protect those values
- Identify issues and opportunities associated with visitor use and the ongoing protection of the MFWS values
- Present an overarching framework to guide land management of the MFWS that reflects the key themes and assists delivery of the land management obligations of the partners
- Present the elements of the concept plan to stakeholders in a form that enables the partners to demonstrate the vision and development potential of the MFWS.



APPROACH

Preparation of the Concept Plan involved:

- review of available data: flora and fauna, topographic information
- extensive site analysis including on-site investigations
- consultation and liaison with key stakeholders
- community engagement via an online survey
- attendance at workshops and committee meetings to discuss direction and key objectives, and
- the development of concepts and details for discussion and refinement.

During the course of the investigations for this concept plan, two workshops were held with representatives of the Wetlands and Woodlands Trust, ACT Parks and Conservation Service and the Friends of Mulligans Flat. Separate consultations were held with local Aboriginal community representatives, ACT Government representatives, and ACT Parks and Conservation field staff. The issues and opportunities identified in the consultation were then considered by the design team in the preparation of the plan.

STRUCTURE

The report is structured to present the MFWS context, a summary of the key issues, followed by identification of site opportunities and constraints.

Section 2 presents an overview of the site context, the legislation and strategic plans relevant to MFWS and the Concept Plan.

Section 3 provides an overview of the significant values and opportunities associated with MFWS.

Section 4 provides an overview of threats and constraints to planning for the MFWS.

Section 5 outlines the opportunities for sustainable visitor use and the target markets appropriate for MFWS.

Section 6 outlines the concept plan with the vision, objectives and planning principles informing the way the opportunities and constraints of the MFWS have been interpreted and an outline of the key concepts with descriptions of the key features and facilities of each visitor precinct.



Viewing native wildlife is a popular activity in the Sanctuary



SECTION 02
PLANNING CONTEXT



This section outlines the location and planning context for the development of the Concept Plan.

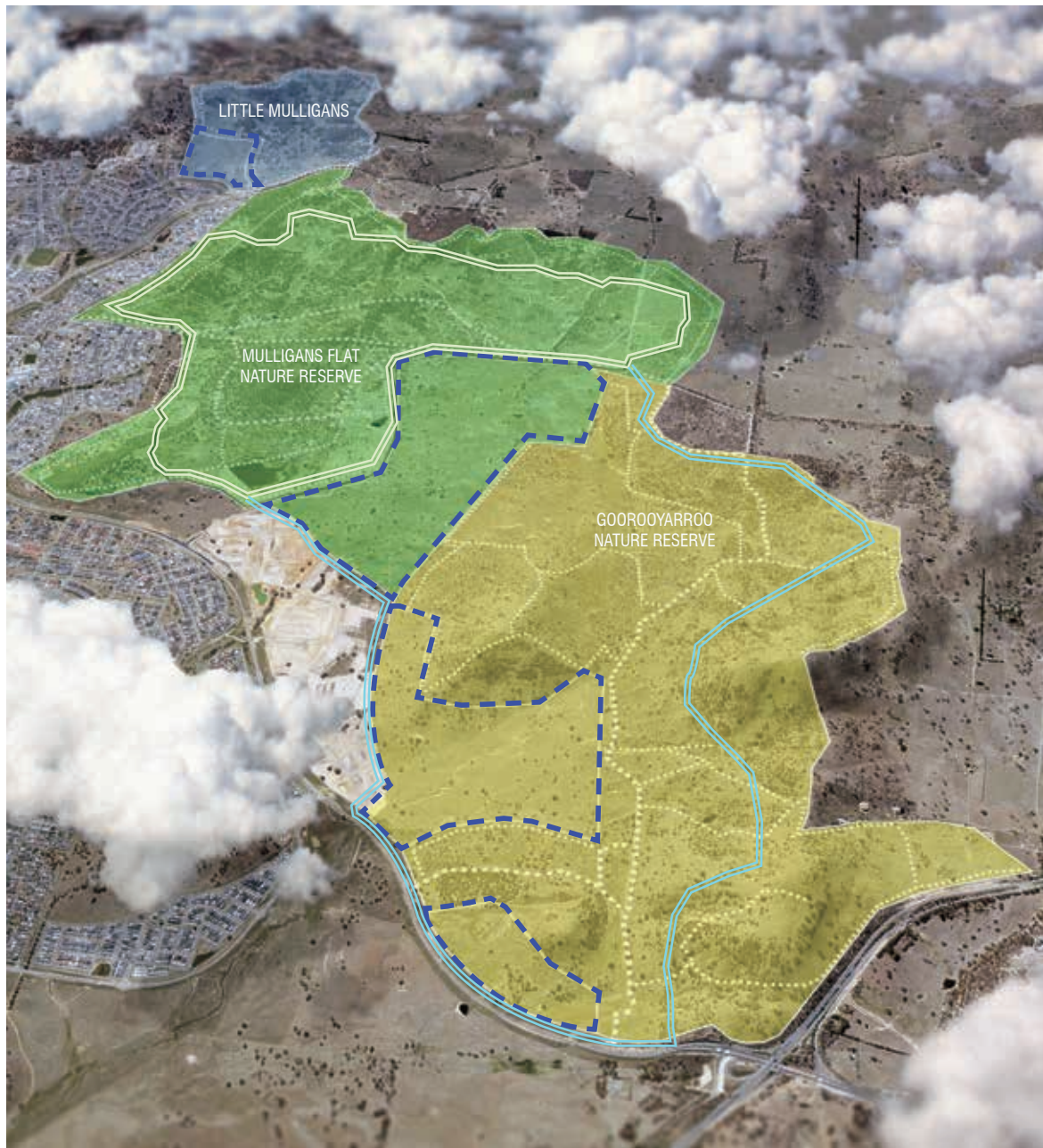
LOCATION

The MFWS has recently been extended to include the original Mulligans Flat Woodlands Sanctuary (located within the Mulligans Flat Reserve); and Goorooyarroo Nature Reserve as well as an area known as the Throsby Offsets (Throsby North, Throsby East and Kenny Broadacre) (Figure 1). The extended sanctuary is now known as Mulligans Flat Woodland Sanctuary and is referred to as MFWS from this point forward in the Concept Plan.

The MFWS is bounded to the north by the ridge along the ACT/NSW border, on the west and south-west by the Gundaroo road and the Canberra suburbs of Forde and Bonner, and on the south east by Horse Park Drive and the new residential area of Throsby. The eastern boundary of MFWS backs onto a section of the Goorooyarroo Nature Reserve in NSW.

Mulligans Flat and Goorooyarroo Nature Reserves are part of Canberra Nature Park, a series of over 30 reserves throughout suburban ACT.

FIGURE 1: MULLIGANS FLAT WOODLAND SANCTUARY



Legend

-  Little Mulligans
-  Mulligans Flat Nature Reserve
-  Gorooyarroo Nature Reserve
-  Offset Area
-  Existing Sanctuary Fence
-  Extended Sanctuary Fence



LEGISLATION AND STRATEGIC PLANNING

The management of all land in the ACT is underpinned or influenced by a wide range of legislation, planning and policy documents relevant to the Concept plan. The conservation and management of the MFWS is bound by a series of obligations outlined in a number of documents summarised as follows:

2.1 CANBERRA NATURE PARK

The Mulligans Flat and adjacent Goorooyarroo Nature Reserves are part of Canberra Nature Park, a series of over 30 reserves throughout suburban ACT. Management efforts across both reserves focus on the following:

- manage the newly added offset areas in accordance with offset management plans
- continue to support the Mulligans Flat – Goorooyarroo Woodland experiment
- support the development and management of an extended Sanctuary
- facilitate improved recreational management and interpretation
- develop and implement a conservation management plan for the significant cultural sites
- continue to support ParkCare
- protect grassland fauna and woodland bird habitat including superb parrot breeding trees.

2.2 THROSBY OFFSET MANAGEMENT PLAN

Areas of land within Canberra Nature Park identified as environmental offsets are also subject to the land management commitments described in Offset Management Plans. These plans are produced to comply with conditions of approval for development that has, will have or is likely to have a significant impact on matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act).

The Throsby Offset Management Plan¹ guides the implementation of ecological management activities within the offset areas (which are included in the MFWS), to protect and enhance the extent and condition of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland) ecological community as well as the habitat and populations of the Golden Sun Moth, Superb Parrot and Striped Legless Lizard.

Specific objectives include:

- to improve the condition of areas that meet the listing criteria for the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland as defined under the Environmental Protection Biodiversity Conservation Act (EPBC Box Gum Woodland)

¹ ACT Government, Extension to the Mulligans Flat and Goorooyarroo Nature Reserves, Draft Offset Management Plan (for the Throsby North, Throsby East and Kenny Broadacre Offset Areas), Commitments 10 within the Gungahlin Strategic Assessment Biodiversity Plan, July 2015

- to improve the condition of areas that currently do not meet the EPBC Box Gum Woodland criteria to a condition that meets the listing criteria
- to improve the management of existing habitat to contribute towards the persistence of a viable local population of Golden Sun Moth in northern ACT
- to improve the management of existing and potential habitat in order to support the recovery of the Superb Parrots
- to improve the management of existing habitat to contribute towards the persistence of a viable population of Striped Legless Lizard.

Appendix 2 outlines the commitments that are specific to the MFWS. These commitments have been considered and integrated into the concept plan where relevant.

2.3 THE NATIONAL CAPITAL PLAN

The MFWS is part of the National Capital Open Space System (NCOSS) – as part of the Hills Ridges and Buffer Spaces and is subject to the General Policies of the National Capital Plan (NCP).

2.4 OTHER REGIONAL AND NATIONAL STRATEGIES

The MFWS also contributes towards delivering the commitments set out in other regional and national plans, strategies and policies relating to:


- the management and recovery of threatened species and ecological communities (including contributing towards the ACT Government's Action Plans for threatened species and communities and the delivery of established long-term research and monitoring programs)
- the assessment and management of places or objects with heritage value
- addressing priority land management issues (e.g. reducing the impact on natural and cultural values from invasive plants and animals, implementing fire management regimes and managing visitor use)
- the management of the Canberra Nature Park.

Appendix 3 provides a summary of the plans and strategies that the management of the MFWS also contributes to.





Dams across the Sanctuary are a reminder of previous land use



SECTION 03
VALUES AND
OPPORTUNITIES

The MFWS is a valuable conservation asset with strong community support. Apart from its significant values, what potentially sets the MFWS apart from other reserves across Australia is the woodland restoration program, the successful reintroduction of rare and endangered species and the community programs aimed at woodland restoration and conserving habitat for threatened wildlife, particularly in a world where ecological habitats are disappearing. This section presents a summary of the key values of the MFWS.

BIODIVERSITY CONSERVATION

The MFWS represents an outstanding woodland biodiversity conservation asset of national significance. It contains one of the most significant areas of the critically endangered Yellow Box–Blakely’s Red Gum Grassy Woodland in Australia and provides habitat for other threatened and rare plant and animal species. Management of the MFWS aims to improve biodiversity, flora and fauna habitat and habitat conditions for threatened species.

The upper slopes of the reserves are dominated by open forests of Red Stringybark (*Eucalyptus macrorhyncha*) associated with Scribbly Gum (*Eucalyptus rossii*), Brittle Gum (*Eucalyptus mannifera*) and Broad-leaved Peppermint (*Eucalyptus dives*). Blakely’s Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*) woodland occurs on the lower slopes with an understorey of flowering plants (shrubs, herbs, grasses, lilies and orchids). Areas of grassland contain a diversity of native grasses and wildflowers and one of the largest stands of Kangaroo Grass (*Themeda triandra*) in the ACT (Figure 2).

This mosaic of communities has produced a high diversity of native plant species and habitat for an array of native ground dwelling and arboreal mammals, birds, reptiles, amphibians and invertebrates, including several threatened, rare or uncommon species. Native plants recorded in the MFWS include 18 tree and 44 shrub species, 47 grass species, about 150 species of herbs or lilies, and 24 rush or sedge species. Over 160 native bird species, 12 mammal species, 16 reptile

species and 8 amphibian species have been observed. Dams created for earlier farming practices provide aquatic habitat for birds, frogs and turtles in the MFWS.

The MFWS has significant potential for habitat restoration and reintroduction of native animal species which have become locally extinct due to past stock grazing and agricultural land uses, vegetation clearing and feral animal predation.

3.1 THREATENED AND RARE ECOLOGICAL COMMUNITIES AND SPECIES

Yellow Box–Blakely’s Red Gum Grassy Woodland (Box-Gum Grassy Woodland) – The MFWS contains one of the largest, most intact and diverse tracts of this critically endangered woodland remaining in Australia. Once occurring over an area extending from southern Queensland to Victoria, 92% of Box-Gum Grassy Woodland (over 5 million hectares) has been cleared and the remainder exists in small fragmented remnants often less than 10 hectares in area. Box-Gum Woodland is listed as critically endangered under both Commonwealth legislation (the *Environment Protection and Biodiversity Conservation Act 1999* – the EPBC Act) and ACT legislation (the *Nature Conservation Act 2014*). The 1,382 hectares of Box-Gum Grassy Woodland in the MFWS is the largest contiguous area of that community remaining in the ACT and the largest area in public ownership in Australia. Of this area, 1,315 hectares meets the classification of Box-Gum Grassy Woodland under the EPBC Act, while 67 hectares is capable of being improved to meet the EPBC Act classification criteria. The woodland area is being restored to improve its biodiversity and habitat value.

Threatened and rare plant species – The MFWS contains populations of the nationally endangered Hoary Sunray (*Leucochrysum albicans*) and the nationally vulnerable Austral Toadflax (*Thesium australe*) which are the only known occurrences of these species in the Gungahlin area. Plant species considered rare in the ACT which occur in the MFWS are Narrow Plaintain (*Plantago gaudichaudii*), Blue Grass Lily (*Caesia calliantha*), Twinging Fringe Lily (*Thysanotus patersonii*), Hairy Centrolepis (*Centrolepis strigosa*) and the Murnong or Yam Daisy (*Microseris lanceolata*), an Aboriginal food plant that has become less abundant due to livestock grazing impacts.

Striped Legless Lizard (*Delma impar*) – Over 50% of the ACT population of the Striped Legless Lizard (which is listed as vulnerable nationally and in the ACT) occurs in Gungahlin. The south of the MFWS contains a small area of habitat (Figure 3).

Golden Sun Moth (*Synemon plana*) – The once widespread Golden Sun Moth is on the brink of extinction due to loss of habitat and is listed as critically endangered under Commonwealth legislation and endangered under ACT legislation. The MFWS supports a large Golden Sun Moth population in around 350 hectares of continuous habitat (Figure 3).

Perunga Grasshopper (*Perunga ochracea*) – The MFWS provides habitat for this flightless grasshopper which is listed as vulnerable in the ACT due to loss of habitat due to urbanisation and agriculture. Another uncommon grasshopper species, Key's Matchstick Grasshopper (*Keyacris scurra*), also occurs in the MFWS.

Superb Parrot (*Polytelis swainsonii*) – The MFWS includes very significant breeding area for the Superb Parrot which is listed as vulnerable nationally and in the ACT. Over half the known nesting sites of this species in the ACT are within the MFWS and protection of this breeding habitat is important for the long term viability of the species in the ACT (Figure 3).

Regent Honeyeater (*Anthochaera phrygia*) – The Regent Honeyeater is listed as critically endangered nationally and in NSW and as endangered in the ACT. Once regularly seen across the ACT, it is now a rare visitor. The MFWS provides important habitat and food resources for this species.

Swift Parrot (*Lathamus discolor*) – Woodlands in the north of the ACT are utilised as winter feeding areas for the Swift Parrot which migrates to mainland Australia after breeding in Tasmania. The Swift Parrot is listed as endangered under Commonwealth legislation and as vulnerable in the ACT (Figure 3).

Other threatened birds – Several other woodland bird species listed as vulnerable in the ACT have been recorded in the Mulligans Flat Reserve and or Goorooyarroo Nature Reserves – Painted Honeyeater (*Grantiella picta*), Varied Sittella (*Daphoenositta chrysoptera*), White-winged Triller (*Lalage sueurii*), Hooded Robin (*Melanodryas cucullata*), and Little Eagle (*Hieraaetus morphnoides*). Areas of Drooping She-oak (*Allocasuarina verticillata*) in Goorooyarroo Nature Reserve provide a critical food source for the vulnerable Glossy Black Cockatoo (*Calyptorhynchus lathamii*). The area is also a regional stronghold for the Scarlet Robin (*Petroica boodang*) which is declining in the ACT. There are also records of the Diamond Firetail (*Stagonopleura guttata*) which is also declining locally and is listed as vulnerable in NSW. The Brown Treecreeper (*Climacteris picumnus*) once locally extinct was reintroduced into the original Mulligans Flat Woodlands MFWS in 2009, however the species was not able to be sustained.

International migratory birds – The MFWS is visited by Latham's Snipe (*Gallinago hardwickii*) the White-throated Needletail (*Hirundapus caudacutus*) and the Rainbow Bee-eater (*Merops ornatus*) which migrate from Asia and are listed as migratory species under Commonwealth EPBC Act.

Locally significant reptiles and amphibians – The MFWS has a high diversity of lizard species including the Spotted-back Skink (*Ctenotus uber orientalis* (known locally from only a few scattered populations in the ACT), the Stone Gecko (*Diplodactylus vittatus*) and the rare black form of the Shingleback (*Trachydosaurus rugosus*). The Black-Headed Snake (*Suta spectabilis dwyeri*) has also been observed.

3.2 REINTRODUCED SPECIES

Eastern Bettong (*Bettongia gaimardi*) – Previously widespread in south-east Australia this species of small mammal became extinct on the mainland in the 1920s, surviving in the wild only in Tasmania. In 2012 Eastern Bettong were reintroduced into the original sanctuary prior to expansion.

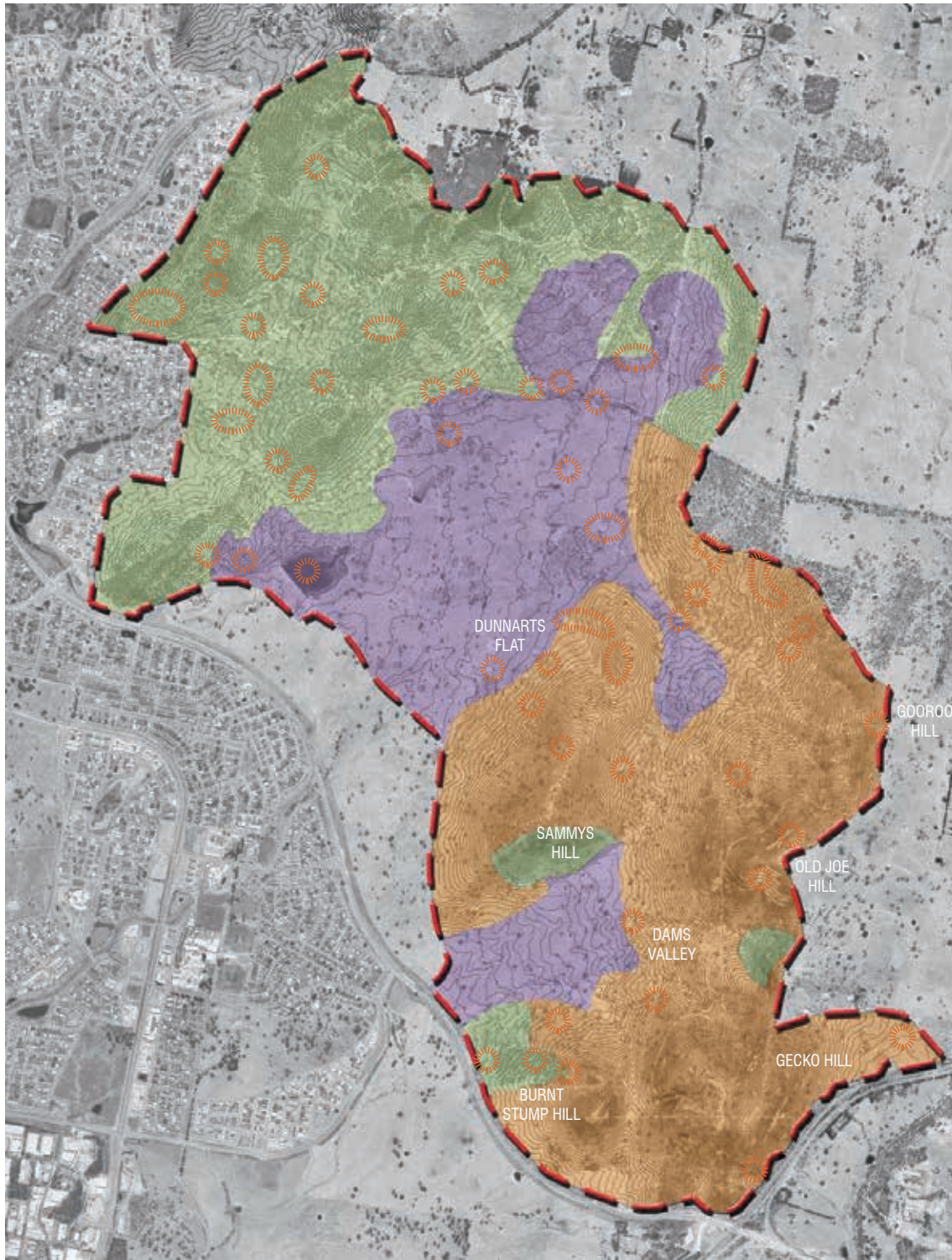
Brown Treecreeper (*Climacteris picumnus*) – Once locally extinct, the Brown Treecreeper was reintroduced in 2009, however the population was lost.

Bush – Stone Curlew (*Burhinus grallarius*) – This ground-dwelling bird has been locally extinct for nearly 50 years. There is a program of reintroduction of groups of birds which will continue into the foreseeable future.






New Holland Mouse (*Pseudomys novaehollandiae*) – This mouse has all but disappeared from the southern and drier inland parts of its distribution and was thought to be extinct until 1967. It was initially released in 2012 and since that time the population has grown.

Eastern Quoll (*Dasyurus viverrinus*) – The Eastern Quoll has been absent from mainland Australia for about 50 years, and in the Canberra region for around 80 or 90 years. It was released in the sanctuary in 2016.

FIGURE 2: LANDSCAPE VEGETATION PATTERNS



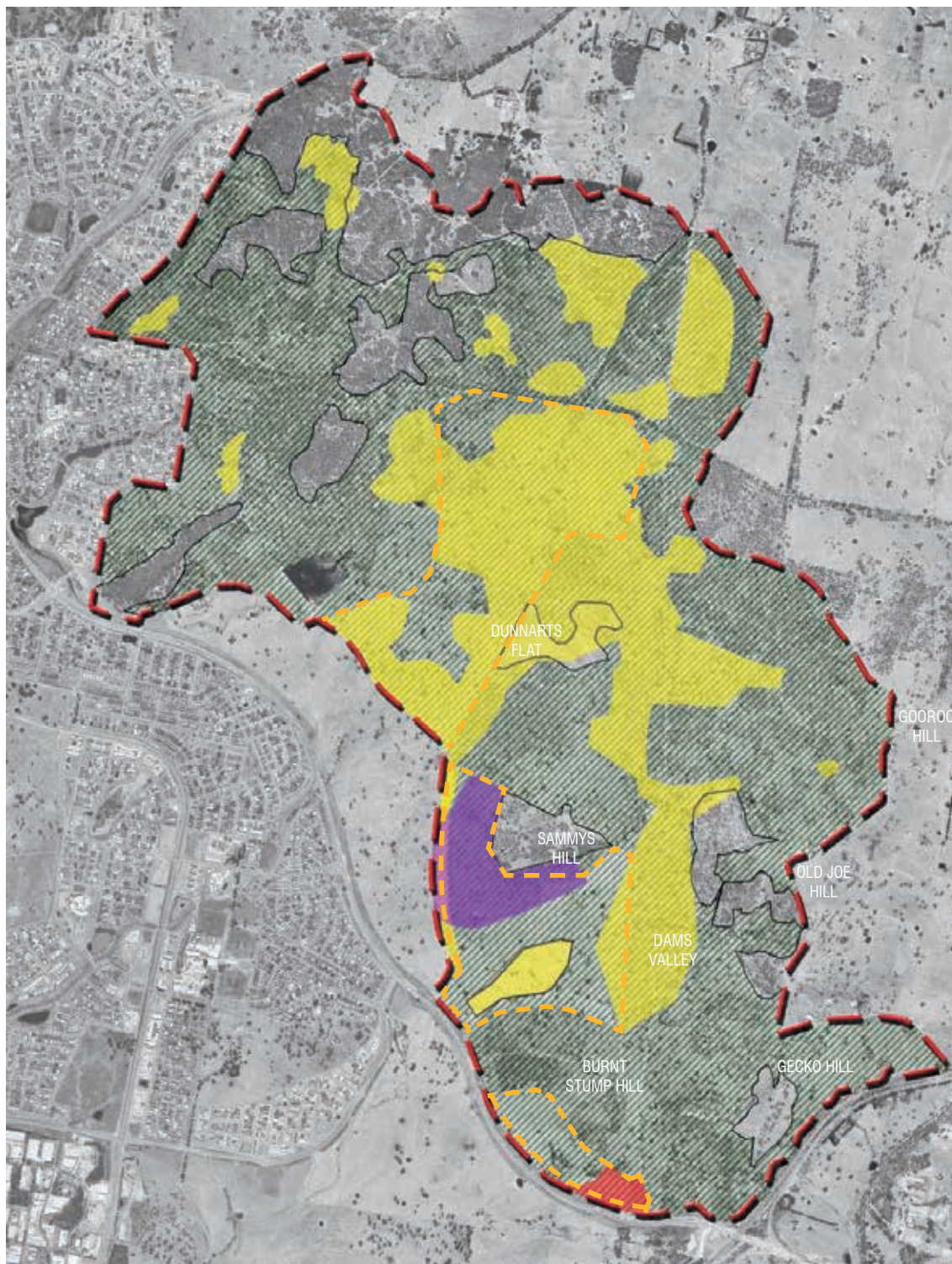
Legend

-  Site Boundary
-  Low-Medium Density Woodland
-  Open Grassy Woodland
-  Medium - High Density Woodland
-  Protected Plant Locations


Landscape Vegetation Patterns

The vegetation patterns are identified on the basis of visual quality assessment and density. The patterns have been identified as Medium to High Density, Low to Medium Density and Open Grassy Woodland. The Medium to High Density areas represents significant stands of dense trees that provide visual enclosure, contrast and interest when moving through the MFWS. The Low to Medium Density areas generally represents intermittent scattered groupings of endemic trees and regeneration providing visual break from open areas and destination points. The Open Grassy Woodland generally have scattered remnant individual trees or small groupings of trees that create visual interest and destinations in the open grass land areas.

FIGURE 3: GOLDEN SUN MOTH, SUPERB PARROT, STRIPPED LEGLESS LIZARD HABITAT AREAS



Legend

-  Site Boundary
-  Golden Sun Moth Habitat
-  Superb Parrot Breeding Habitat
-  Striped Legless Lizard Habitat
-  Offset Management Zone
-  Box Gum Woodland

Nationally Significant Habitat Areas

Mapping data sourced from *Extension to the Mulligans Flat and Goorooyaroo Nature Reserve - Draft Offset Management Plan - July 2015*

ECOLOGICAL RESTORATION AND RESEARCH

The MFWS is the site of an ecological restoration research project, the Mulligans Flat-Goorooyarroo Woodland Experiment that is of international importance. The project is aimed at both restoring and actively managing the biodiversity of the reserve and gaining a better understanding and evidence for management and ecological restoration of temperate woodlands.

The Mulligans Flat-Goorooyarroo Woodland Experiment, established in 2004, is a partnership between the Australian National University, CSIRO and ACT Government with assistance from other researchers and community groups. An initiative of the experiment was the introduction of a predator proof fence in the original and smaller Mulligans Flat Woodland Reserve, as well as 94 experimental plots and associated monitoring to investigate the impact of management actions (including addition of logs, burning, exclusion of kangaroos and feral predators) to restore the structure and function of woodland

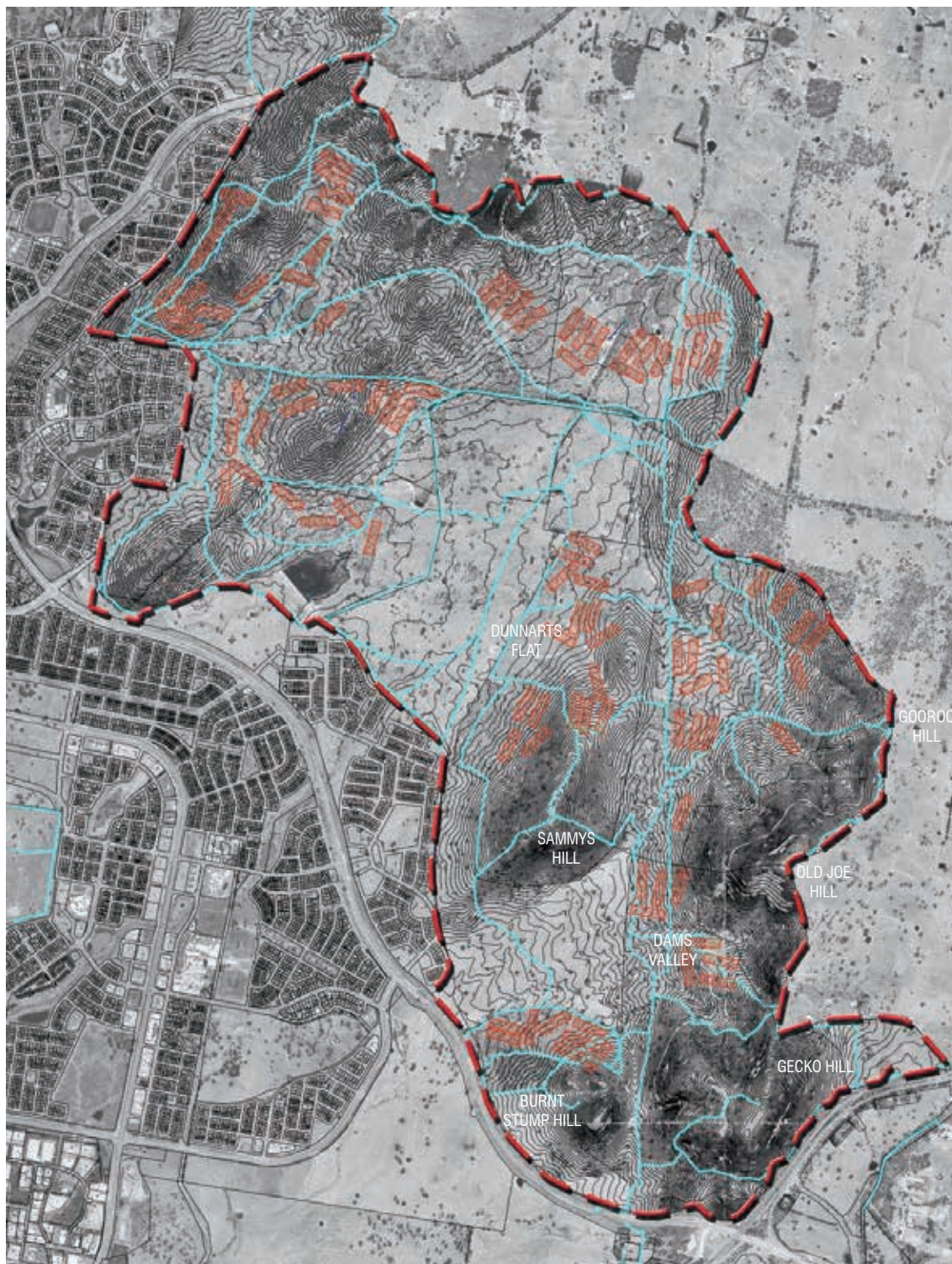
ecosystems. A number of research plots are scattered throughout the MFWS (Figure 4).

Locally-extinct species that have a 'restorative' effect on the environment have been gradually re-introduced into the original sanctuary and will continue in the expanded MFWS. They include the 2012 re-introduction of the Eastern Bettong which, through its extensive digging activity, is thought to be an 'ecosystem engineer' having a significant impact on soil, water infiltration, seed germination and litter accumulation. Potential releases may include Brush-tail Phascogale (*Phascogale tapoatafa*), Southern Brown Bandicoot (*Isodon obesulus*), Long-nosed Bandicoot (*Perameles nasuta*), Diamond Python (*Morelia spilota*), Yellow-footed Antechinus (*Antechinus flavipes*) and Eastern Chestnut Mouse (*Pseudomys gracilicaudatus*). As part of the experiment, woody debris is brought into the research area to replace what has been removed to test whether this has a biodiversity result.




In addition to the presence of one of the most extensive remaining areas of Box-Gum Grassy Woodland, the MFWS is especially suited to ecological research due to its long-term management by the ACT Government; its location near the universities, schools and research institutions in Canberra; and the presence of a well-educated and supportive local community.



FIGURE 4: RESEARCH PLOTS



Legend

-  Site Boundary
-  Research Plots
-  Existing Tracks

Research Plots and Existing Tracks

The site is scattered with experiment plots, outside the Offset Management Zones. Ground assessment of the site did not identify some of these plots as current or in use. There is an opportunity to provide informative signage about the plots and plot locations.

COMMUNITY CONSERVATION PARTNERSHIPS

Programs offered by the Woodland and Wetlands Trust contribute significantly to community partnerships in conservation management in the ACT. The local community, institutions, scientists and groups are vital partners in management of the MFWS. Community volunteers are making an important contribution to local conservation science and understanding of biodiversity.

Establishment of the original nature reserve in 1995 was based on a proposal by several community conservation groups and was followed in 2004 by the establishment of the Woodland Experiment partnership with scientific research institutions. The MFWS is a centre of community science and voluntary conservation activities. Community groups such as Friends of Mulligans Flat, Frogwatch, Waterwatch and the Canberra Ornithologists Group participate in ecological monitoring in the original sanctuary. The Bush on the Boundary group was established in response to the development of the suburbs of Forde and Bonner adjoining the original sanctuary and has expanded its interest to the urban/natural area interface in other areas of Gungahlin. Community groups, developers and local residents have been instrumental in promoting the practice of cat containment in nearby suburbs. The community is encouraged to take an active role in management and monitoring activities are encouraged through the 'Friends of Mulligans Flat' group, which also coordinates community events such as bird walks, wildflower walks and film and information evenings. It is anticipated that new residents of Throsby will contribute to volunteer program in the MFWS.



CULTURAL LANDSCAPE

3.3 ABORIGINAL HERITAGE

The MFWS forms part of the wider Gungahlin area which was once extensively used by Aboriginal people. Ngunnawal people occupied and actively managed the landscape of the Canberra region for more than 25 000 years prior to European settlement through traditional burning and other sustainable land management practices. They continue to feel a deep responsibility to preserve the spirit and stories of their ancestors embedded throughout the landscape today. Neighbouring language groups including the Ngambri, Ngarigu, Wolgalu, Gundungurra, Yuin and Wiradjuri people also maintain a strong association with the region, through their ancestral relationships with the area.

Significant landscape features such as hills, mountains, and ridgelines aided navigation and provided vantage points for its residents and for those travelling through country. In addition, many have cultural significance as features created by ancestral beings or as places of ceremony. Lowland Canberra was rich in food such as kangaroos, lizards, turtles, yabbies, fish, frogs and edible plants. Trees and other plants were used to build shelter and create tools, weapons, canoes, coolamons, baskets and rope. Quarries provided stone for the manufacture of tools and ochre for art, decoration and ceremony.

The country now known as MFWS is likely to have offered a variety of resources for food, shelter, tools, social and ceremonial life derived from the woodlands, grasslands and creeks which supported a range of mammals, birds, reptiles and invertebrates.





As a result of its history of Aboriginal occupation, there are a broad range of Aboriginal heritage places and sites of cultural and archaeological significance scattered throughout MFWS. An Aboriginal stone quarry site (which supplied a source of quartz and chert) is located in the MFWS together with several stone artefacts, scarred trees, and stone arrangements (Figure 5).

While some are listed in the ACT Heritage Register, it is important to recognise that there are numerous Aboriginal heritage sites recorded throughout MFWS not listed in the Heritage Register, and many more sites that are as yet unrecorded.

All Aboriginal places and objects found in the MFWS are listed and protected under the ACT *Heritage Act 2004*. They are protected in consultation with local Heritage legislated Registered Aboriginal Organisations (RAOs) and other Traditional Custodial groups.

The MFWS provides an opportunity for the region's Aboriginal communities and custodians to maintain connections to, and participate in management of, traditional country following the disruption and dispersal of the traditional way of life that occurred with the occupation of that country during European settlement of the region.

3.4 HISTORIC HERITAGE

The MFWS contains reminders of the 19th and early 20th century European settlement of Gungahlin that provide insights into the way of life and use of land in those times that has now been largely subsumed by urban development. These elements contribute to the story of Gungahlin told in homesteads and other historic sites in the area (Figure 5).

Of special significance is the Old Coach Road which is listed for protection on the ACT Heritage Register under the ACT *Heritage Act 2004*. The Old Coach Road,

constructed in 1880, linked the rural settlements of the region to Bungendore and roads and the railway between Bungendore and Sydney. It was an important local road transport link for the regional communities, providing a route for mail services, supplies, produce and transport to schools, churches and townships. It is also understood that the Old Coach Road may have followed the route of the traditional pathway taken by Aboriginal people moving through country. While much of the original route of the Old Coach Route no longer exists in its original form, some parts are visible in the MFWS.

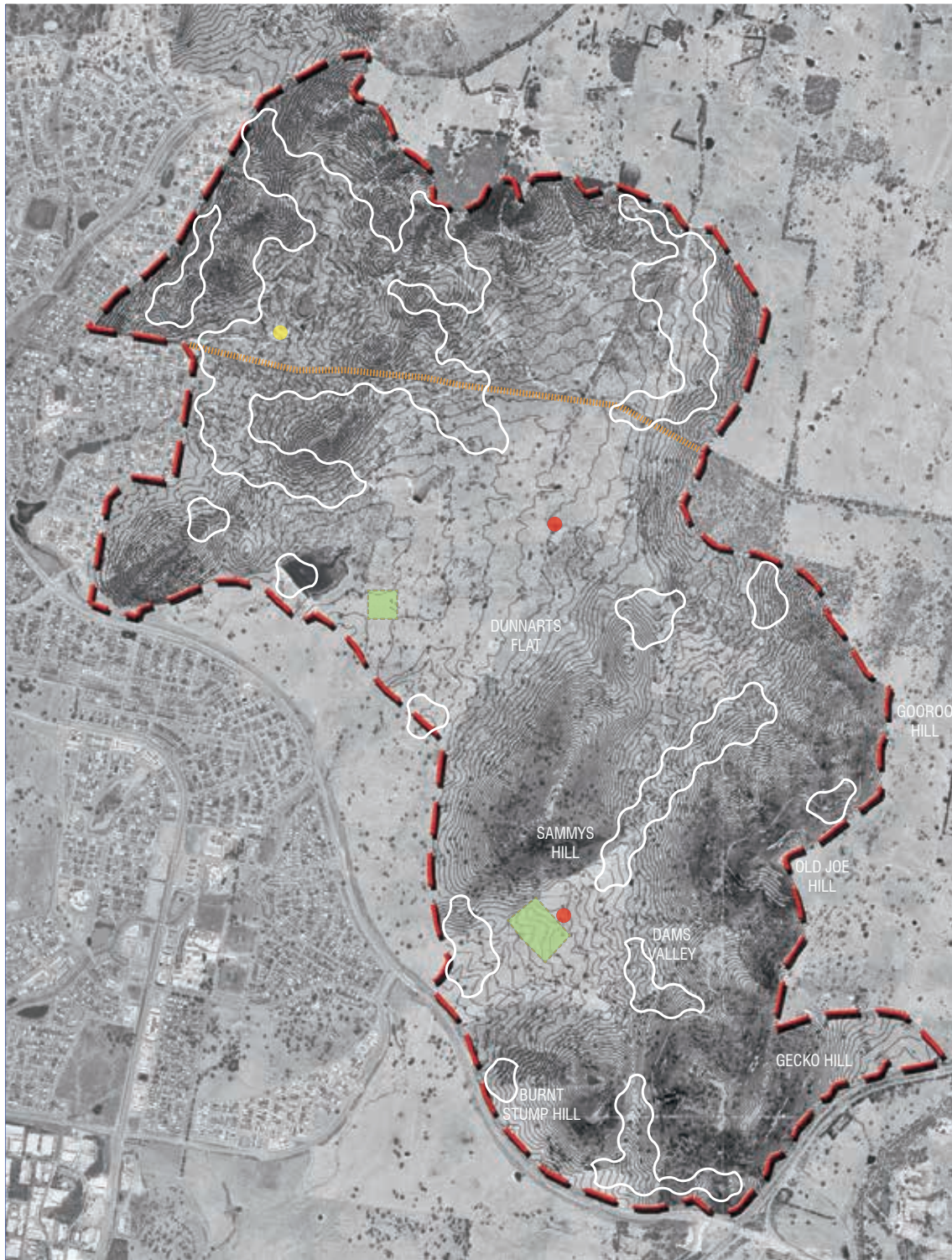
The Mulligans Flat Ploughlands, also listed on the ACT Heritage Register, are within the Extended MFWS and are a significant example of animal-drawn ploughing for agriculture before the advent of tractor-drawn ploughs. These ploughlands form an area of discernible ridges and furrows and are one of the most intact ploughlands remaining out of 65 ploughland sites which once existed in the ACT. The site includes an area of elms which may have been a hut or yard site.

The site of the former Mulligans Flat School (one of several small schools serving the region's scattered rural population) is within the Mulligans Flat Nature Reserve (outside the MFWS) and is marked by some chimney remains, pine trees planted in 1920 and other exotic plants. The first slab hut school was built on the Mulligans Flat site in 1896. A larger weatherboard building was constructed in 1913 and removed in 1933.

Within the MFWS a stone chimney, brick and stone scatters and an orchard remain of the Inglewood Homestead which was built in about 1893 and occupied until about 1925. A heritage assessment has yet to be conducted for this site.

Markers from the 1910 to 1915 survey of the ACT/NSW border for the excision of the land for the Australian Capital Territory from New South Wales are still evident on the border of Goorooyarroo Nature Reserve.

FIGURE 5: CULTURAL LANDSCAPE OF MFWS



Legend

-  Site Boundary
-  Proximity of known Aboriginal sites
-  Ploughed Lands
-  European Ruin
-  Woolshed
-  Old Coach Road

Heritage Sites - Aboriginal and European

The MFWS forms part of the wider Gungahlin area which was once extensively used by Aboriginal people. As a result of its history of Aboriginal occupation, there are a broad range of Aboriginal heritage sites of archaeological significance scattered across MFWS however it is understood that there are many more sites that are as yet unrecorded. The MFWS also contains reminders of the 19th and early 20th century European settlement of Gungahlin such as homesteads, the Old Coach Road and ploughed lands. Together the Aboriginal and European cultural heritage landscape of MFWS provide interpretation opportunities for visitors.

EDUCATION AND LEARNING

The MFWS is an important and accessible 'outdoor laboratory' providing information and insights on woodland ecological restoration for students, scientists, researchers and land managers. It is also a resource for enabling the general community and visitors to learn about, and be inspired by nature and biodiversity conservation.

The MFWS aims to provide a picture of the past natural landscape and to inspire visitors and the local community to observe and learn about woodland restoration. An increasing range of interpretation, tours, information and community engagement is being offered. School and early learning groups currently use the MFWS for outdoor learning activities.

A total of 1235 people participated in Mulligans Flat Outreach Activities (Twilight Tours and walks) over 18 months between October 2014 and May 2016. From these figures it can be estimated that around 800–900 people participate in these programs over a 12-month period. Of these 794 people (64%) participated in paid activities, and 441 (36%) in free activities. In general, participation in activities is increasing.

The Woodland Experiment in the MFWS addresses the critical need in Australia for long-term, rigorous, experimental ecological research to inform conservation decision making, adaptive management and conservation techniques used by public and private land managers.

Knowledge transfer of the findings of the Woodland Experiment occurs through conferences, annual forums, scientific papers, information sheets and outreach programs. Locally, the findings of research in the MFWS have implications for the way natural areas in the ACT are being managed.

LANDSCAPE CONNECTIVITY

The MFWS is a keystone in providing ecological connectivity across the landscape of northern ACT and nearby areas of NSW. It also provides a natural, scenic backdrop to the suburbs of Gungahlin and expresses the ethos of Canberra as the 'bush capital'.

Connections across the landscape have a critical role in achieving biodiversity conservation and resilience as urbanisation, agriculture, other intensive land uses and climate change lead to loss and fragmentation of areas of native vegetation and habitat. Links provided by reserves and other areas of vegetation assist wildlife to move across the landscape, assist the spread of plant populations, and promote diverse ecological communities and ecosystem health.

The large contiguous area of MFWS is a keystone area in providing vegetation and habitat links across the north of Gungahlin, into NSW and to woodland areas in the Majura Valley and the Mount Majura and Mount Ainslie reserves to the east. Vegetation linkages are also provided from the MFWS through other reserves in Gungahlin and along Ginninderra Creek to the Murrumbidgee River.

Contiguous with the Gorooyarroo Nature Reserve in the ACT is an additional 24 hectares of reserve that is managed by NSW National Parks and Wildlife Service. This reserve is part of a larger reserve covering several areas also named Gorooyarroo Nature Reserve in NSW.

Combined with other woodlands within northern ACT and adjacent NSW, the MFWS form one of the largest, best connected and most diverse patches of Box Gum Woodland remaining in south-eastern Australia. The area is also part of the Molonglo River to Barton Highway Woodland corridor, which has been nominated for provisional registration on the ACT Heritage List for its natural heritage values.

RECREATION AND TOURISM

The MFWS offers opportunities for healthy, outdoor recreation and nature appreciation in a natural setting. For many an important value of MFWS is the perceived wildness, naturalness, sense of remoteness, solitude and tranquillity within close proximity to Australia's capital city. There are opportunities for nature-based activities such as bushwalking, birdwatching, wildlife viewing, interpretation and general nature appreciation experiences in a tranquil, nature setting. The MFWS is considered to be one of the best birdwatching areas in the ACT.

The extensive network of walking trails provides for easy access. The Centenary Trail runs through the MFWS offering cyclists the opportunity to enjoy the features within the MFWS and the adjacent reserves.

The natural landscape of the hills, ridges, slopes and lowlands of the MFWS are a scenic backdrop to the east of the suburbs of Gungahlin. The closeness of this natural landscape to areas of urban development improves the amenity of the area for local residents, creating a sense of connection to the natural environment (Figure 6).

The main purpose of visit for most visitors to MFWS is to enjoy nature and the peace and quiet. Others use the reserve for health and fitness while some visit to experience and learn about the natural environment.

The most popular activities for visitors are walking, wildlife viewing and birdwatching and most visitors spend half a day in the reserve². Most visitors (57%) visit the MFWS on weekends while a surprisingly high number of visitors enjoy the reserve during the week. This corresponds to the high number of visitors who are using the reserve for health and fitness purposes (23%).

Interestingly, a high proportion of visitors enjoy the reserve alone (27%) while 24% visit with their family and 23% with their partner.

In 2015 it is estimated that around 3000 people visited the MFWS as part of an organized event³. A number of community, sporting and local special interest events occur in the reserves involving sporting groups, scout groups, preschool, primary and secondary schools as well as special interest groups.

OTHER VALUES

3.5 TOPOGRAPHY

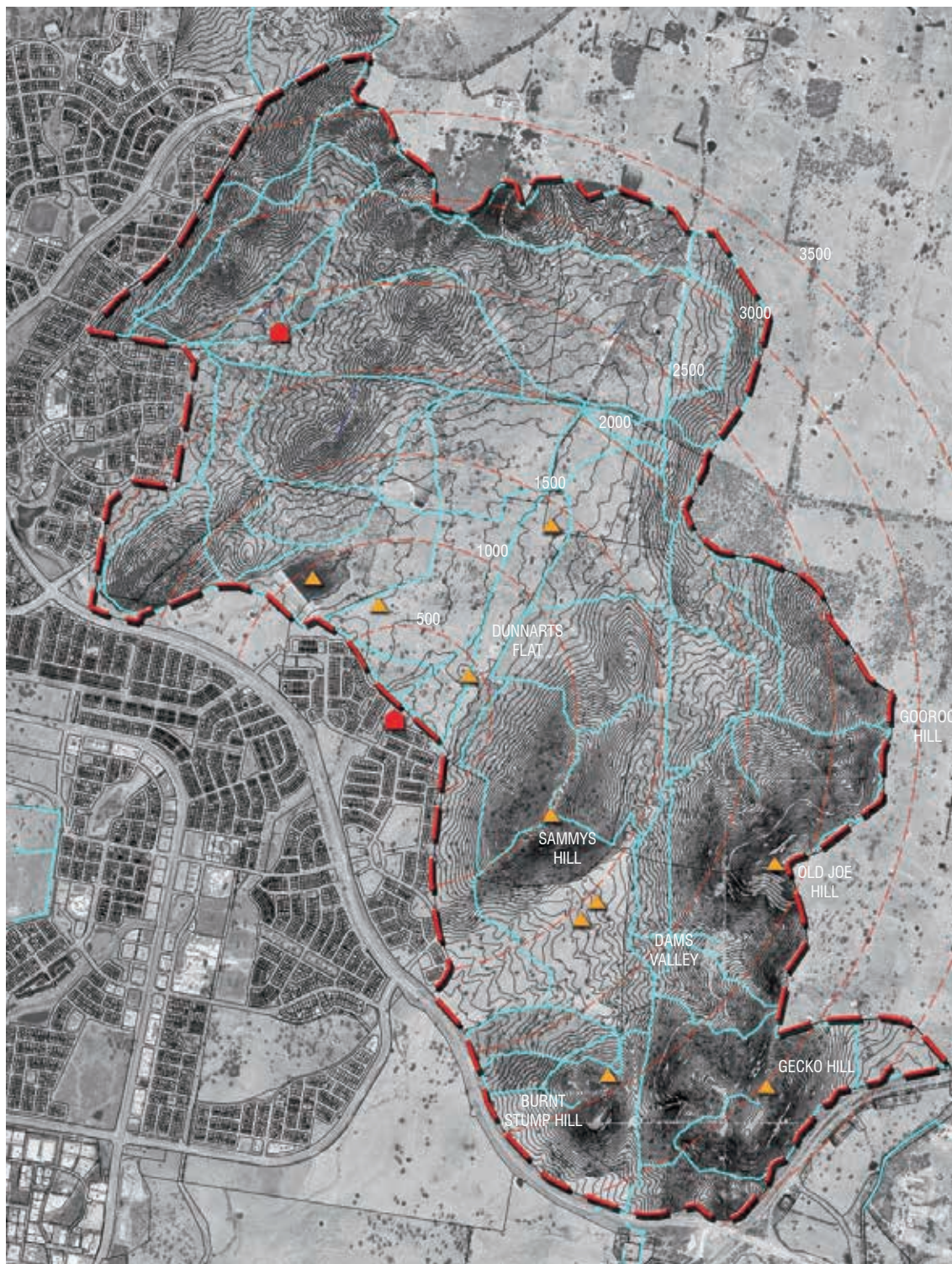
The topography of the MFWS varies considerably from the flat lands in the central areas to the rolling hills in the north to the peaks and valleys in the south (Figure 7). The varied topography, extensive woodland and grassland vegetation, ridges and hills provide visual interest and habitat for a high diversity of native plant and animals.








² TRC Tourism Mulligans Flat Community Survey 2016

³ ACT Parks and Conservation Service unpublished data 2016

FIGURE 6: KEY VISITOR FEATURES



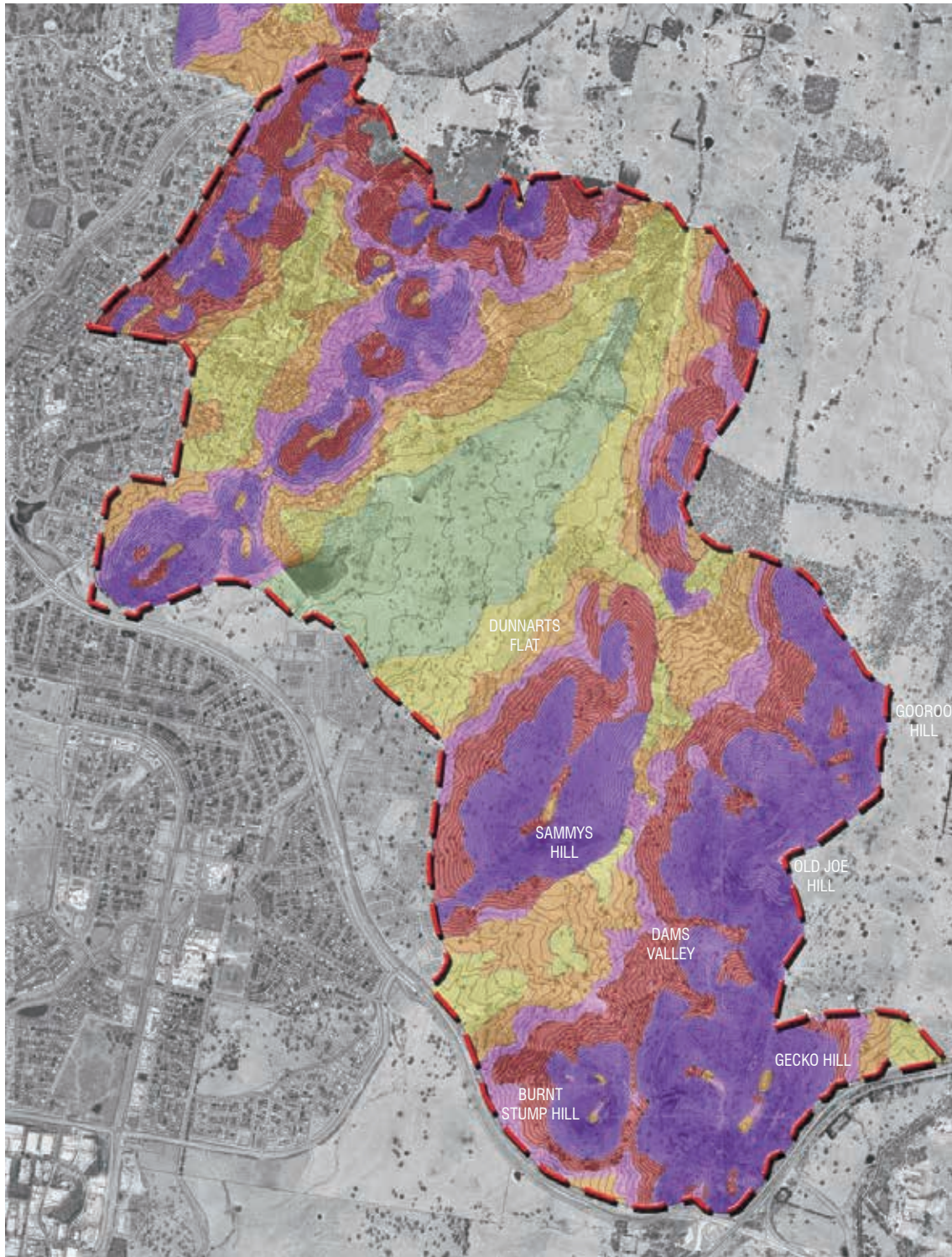
Legend

-  Site Boundary
-  Woolshed and Woodland Learning Centre Locations
-  Points of Interest
-  Existing Tracks
-  500m offset intervals from proposed Woodland Learning Centre









Key Visitor Features

The MFWS has many key features of interest to visitors including heritage sites (homesteads, ploughed lands), hills and valleys, woodland and water bodies for wildlife viewing and bird watching.

FIGURE 7: TOPOGRAPHY



Legend

-  Site Boundary
-  Grade > 1 in 100
-  Grade > 1 in 50
-  Grade > 1 in 30
-  Grade > 1 in 20
-  Grade > 1 in 10
-  Grade > 1 in 5
-  Mulligans Flat 2m Contours

Topography

The topography for the MFWS varies considerably from the flat lands in the central area to the rolling hills in the north to the peaks and valleys in the south. This variety in landform provides visual interest as well as variable habitat situations. The central flat land is dominated by the east west flat central drainage area with slopes generally 1 in 100 or flatter. The peripheral edge area of the flat lands has slopes between 1 in 100 and 1 in 50. The northern rolling hills area features a central valley with slopes between 1 in 50 and 1 in 30. The east west ridge lines enclosing the central valley have slopes between 1 in 20 and 1 in 5. The southern peaks and valleys area is dominated by five significant peaks Sammys Hill, Burnt Stump Hill, Gecko Hill, Gooroo Hill and Old Joe Hill. These peaks enclose the north south central Valley, Dams Valley. The upper slopes on the peaks have slopes between 1 in 5 and 1 in 10. The central valley has slopes between 1 in 30 and 1 in 50.



3.6 CATCHMENTS AND DRAINAGE

The MFWS occupies the head waters of three creek catchments, Ginninderra Creek, Gungaderra Creek and Sullivans Creek that flow in a westerly direction to the surrounding urban areas. The upper Ginninderra Creek catchment is located in the northern part of the MFWS catching runoff water from both the north and south side of the main ridge line in the area. Ginninderra Creek runs from the MFWS to Yerrabi Pond and through the northern suburbs of Gungahlin and Belconnen to Lake Ginninderra.

The Gungaderra Creek catchment drains the southern part of the central flat land and the northern slopes of Sammys Hill. Gungaderra Creek runs to the adjacent suburbs to the west flowing through wetlands in the suburbs of Harrison and Franklin and joins Ginninderra Creek at Kaleen.

The upper Sullivans Creek catchment in the MFWS catches runoff from all of hills and valleys of southern part of the area. This catchment is the significant head waters for Sullivans Creek that flows through southern Gungahlin and north Canberra to Lake Burley Griffin. Areas of this creek have significant erosion problems that need restoration work (Figure 8).

3.7 SURROUNDING LAND USE

The MFWS is located in one of the ACT's population growth areas which will generate 40.7% of the ACT's total population growth over the next few years. The new residential area of Throsby will be developed over the next few year years. The MFWS has numerous entry points for walkers and cyclists as well as management vehicles (Figure 9).

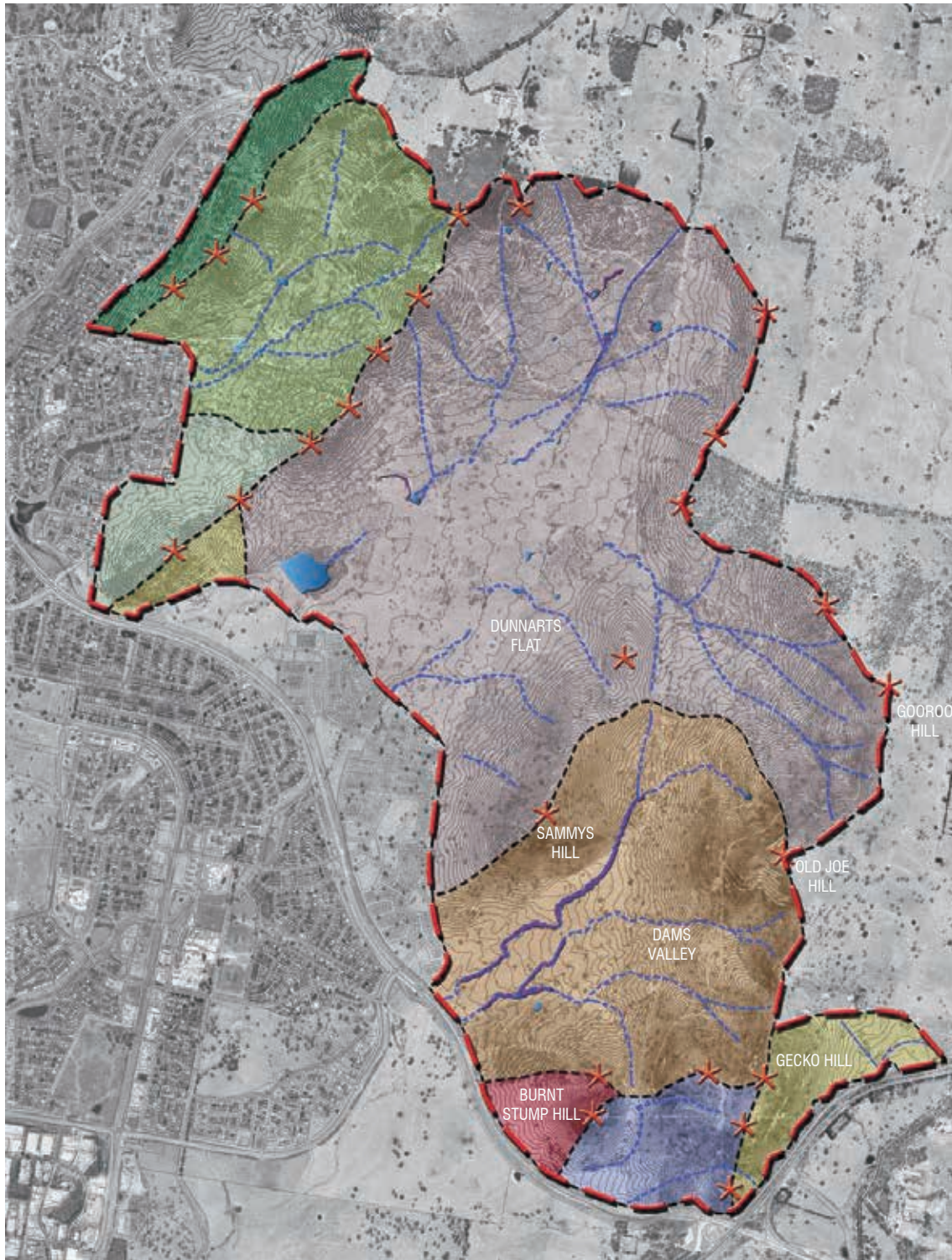
A community survey conducted between April and May 2016⁴ indicates that visitors to the Mulligans Flat and Gooyoorooyoo Reserves live mostly within the local vicinity and surrounding Canberra area. Most visitors reside in the northern areas of Canberra and at least 40% visit weekly and enter via the Forde entrance. This is not surprising considering around 35,000 people reside within 15 minutes of the Extended MFWS. The median age of the population is 32 to 35 years old indicating that these suburbs are also likely to have a high percentage of young families.

3.8 SERVICES








The MFWS has very few services located within its boundary. Services identified are natural gas pipeline and AAPT fibre optic telecommunication cable running north from southern boundary along the north south central valley crossing the Old Coach Road and exiting the MFWS at the north west boundary (Figure 10).

4 TRC Tourism Mulligans Flat Community Survey 2016

FIGURE 8: CATCHMENT VALUES



Legend

-  Site Boundary
-  Erosion Areas
-  Drainage Lines
-  Water Bodies
-  Hill Peaks
-  Catchment Boundary Lines
-  2m Contours

Drainage Patterns

The MFWS site occupies the head waters of three creek catchments, Ginninderra Creek, Gungaderra Creek and Sullivans Creek that flow in a westerly direction to the surrounding urban areas.

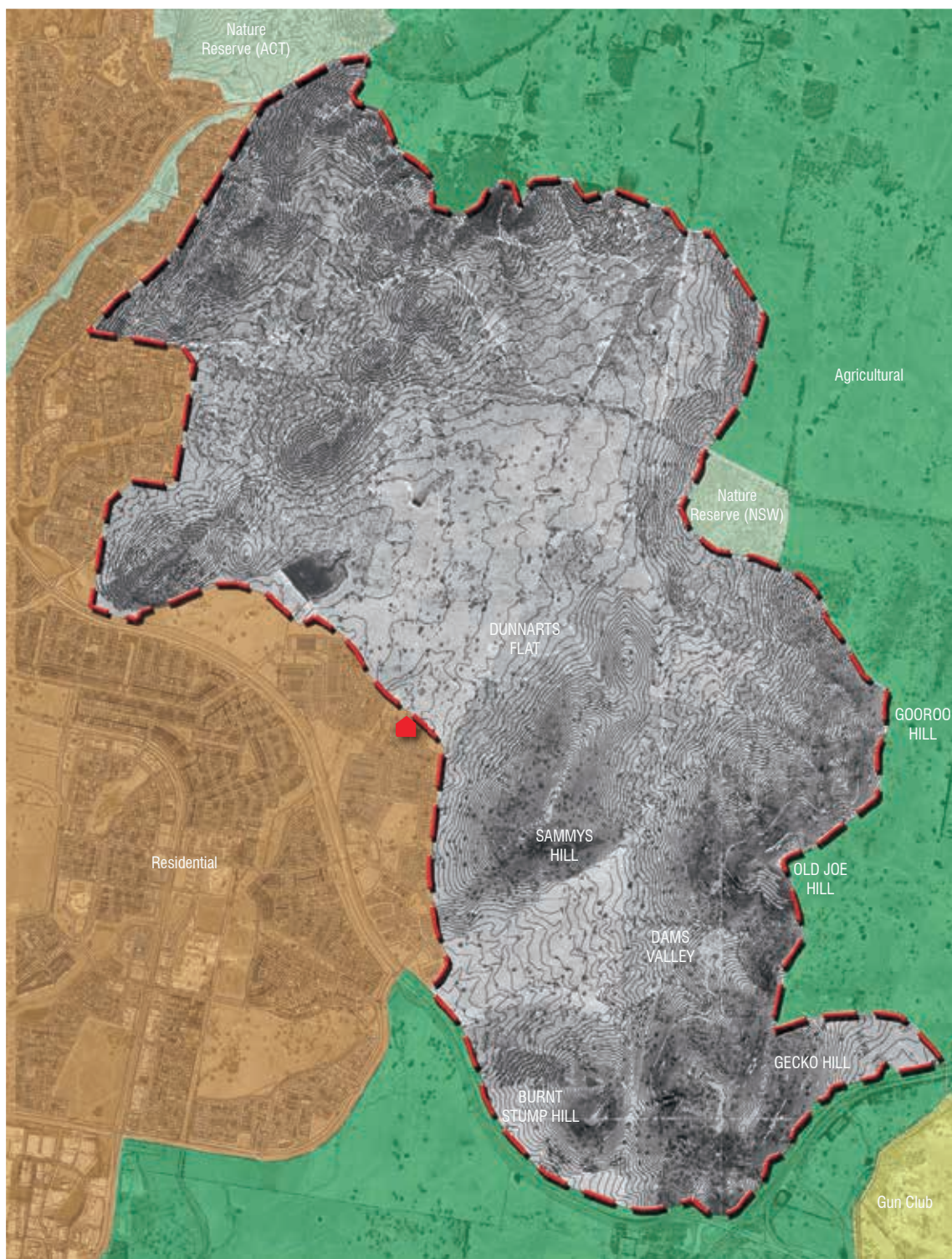
The upper Ginninderra Creek catchment is located in the northern part of the MFWS catching runoff water from both the north and south side of the main ridge line in the area. Ginninderra Creek runs from the MFWS to Yerrabi Pond and through the northern suburbs of Gungahlin and Belconnen to Lake Ginninderra.

The Gungaderra Creek catchment drains the southern part of the central flat land and the northern slopes of Sammys Hill. Gungaderra Creek runs to the adjacent suburbs to the west flowing through wetlands in the suburbs of Harrison and Franklin and joins Ginninderra Creek at Kaleen.

The upper Sullivans Creek catchment catches runoff from all of hills and valleys of southern part of the MFWS. This catchment is the significant head waters for Sullivans Creek that flows through southern Gungahlin and north Canberra to Lake Burley Griffin. Areas of this creek have significant erosion problems that need restoration work.

As the northern-eastern boundary of the Mulligans Flat and Gooroaroo Nature Reserves coincides with the ACT and NSW boundary and is located on the ridge line the catchments in each nature reserve are totally within the ACT.

FIGURE 9: SURROUNDING LAND USE



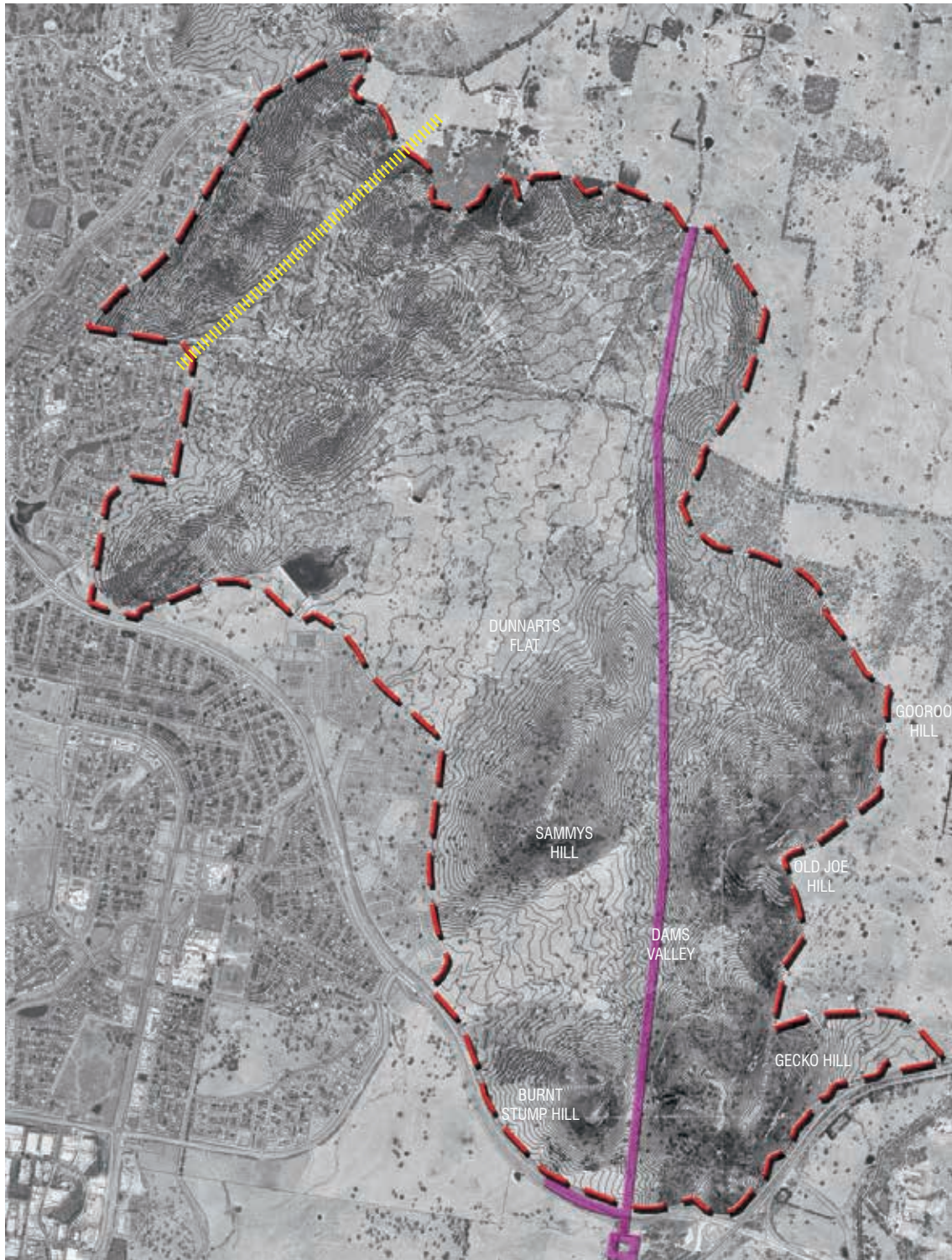
Legend

-  Site Boundary
-  Residential
-  Gun Club
-  Nature Reserve
-  Agricultural land
-  Woodland Learning Centre




Surrounding Land Use

The MFWS is bound by mainly residential, future residential and agricultural land uses with numerous potential pedestrian linkages across the overall site. This allows for extensive visitor usage to all areas.

FIGURE 10: SERVICES



Legend

-  Site Boundary
-  Natural Gas Pipeline and AAPT Fibre Optic Telecommunications Cable
-  Overhead Power Lines

Services

The MFWS has very few services located within its boundary. Services identified is a natural gas pipeline and AAPT fibre optic telecommunication cable running north from southern boundary along the north south central valley crossing the Old Coach Road and exiting the MFWS at the north west boundary. Overhead powerlines cross over the MFWS from Forde ACT to neighbouring properties in NSW.

Snapshot of key values

The MFWS has an extensive range of values for consideration in the development of the concept plan including:

- One of Australia's most outstanding examples of woodland biodiversity conservation of national and local significance.
- A rich cultural landscape with Aboriginal heritage and historic heritage features
- Extensive biological conservation programs and internationally recognised ecological restoration
- International research programs with active research plots in MFWS
- Community partnerships and Citizen Science Programs
- Established education programs growing in popularity and importance
- Landscape connectivity with other reserves in the ACT
- Recreation and tourism opportunities valued by the community
- Expanding residential population – creating opportunities as well as pressure





The Eastern Quoll was reintroduced to the Sanctuary in 2016 after being absent in the Canberra region for about 90 years.



SECTION 04
THREATS TO THE
KEY VALUES

Careful management of the Sanctuary’s values will be needed to achieve the vision for the MFWS. This section outlines the key threats and recommended mitigation strategies

POTENTIAL THREATS

Biodiversity, landscape and cultural heritage values have persisted in the area despite some clearing for grazing, cropping and fire wood, agriculture and urban development. However, many of the values of the MFWS are remnants of the former ecological communities in the area and are vulnerable to the ecological changes associated with past agricultural uses and the growth of the regional population. Additionally, impacts on the integrity of the MFWS’s values will arise from the new urban development and anticipated recreational use.

Current and future threats to values of MFWS are summarised in Table 1.



TABLE 1: POTENTIAL THREATS TO THE MFWS AND MITIGATION MEASURES

Threat	Potential Impacts	Measures that will be used to manage threats
Spread of weed species	<p>Competition with native vegetation communities and species.</p> <p>Impacts on habitat and Box-Gum Woodland</p> <p>Impacts on ecosystem restoration works.</p>	<p>Prioritise and actively manage invasive weeds in accordance with the ACT Weeds Strategy and annual invasive weeds operations plan.</p> <p>Prevent new weed problems through vehicle & equipment hygiene.</p> <p>Evaluate the effectiveness of weed control, particularly in relation to conservation outcomes.</p> <p>Systematically map and monitor the distribution and spread of weeds to detect trends and improve effectiveness of control programs.</p> <p>Conduct early targeted control on new incursions of weed species before they become widespread.</p> <p>Strengthen partnerships with adjacent land managers and the community in weed management, including early detection, surveillance and coordinated control.</p> <p>Maintain alerts for emerging environmental weeds and provide information to assist the community in identifying and reporting new weeds species of concern.</p>

TABLE 1: POTENTIAL THREATS TO THE MFWS AND MITIGATION MEASURES (CONTINUED)

Threat	Potential Impacts	Measures that will be used to manage threats
Pest animals	<p>Impacts on biodiversity of native vegetation communities through pest animals, introduction of weed species and suppression of vegetation regeneration.</p> <p>Disturbance of native animal habitat.</p> <p>Reduction of ground cover leading to soil erosion.</p>	<p>All foxes, cats and hares were removed from within the MFWS. Some rabbits remain and a plan for their eradication is being implemented.</p> <p>A program to control and ultimately eradicate foxes, cats, rabbits and hares from the planned MFWS will commence once the extension to the predator proof fence is complete. Actions to control or eradicate these species within the extended fenced area will follow a strategic approach guided by appropriate experts and informed by the experience gained from similar programs in the original sanctuary. Other actions include:</p> <ul style="list-style-type: none"> ▪ Controlling rabbits and other pest animals over the long term, with priority given to follow up actions ▪ Coordinating cat control and compliance in reserves with programs in adjacent cat containment areas ▪ Maintaining suburbs in the vicinity of MFWS as a priority for fox control. <p>The Habitat Improvement Plan for the Superb Parrot (ACT Government 2014a) and Golden Sun Moth (ACT Government 2014b) specifically mentions the control of the Common Myna (<i>Acridotheres tristis</i>), Noisy Miner (<i>Manorina melanocephala</i>), stray or feral cats and the European Wasp (<i>Vespula germanica</i>).</p> <p>A strategy will be developed to engage the local community in establishing programs for European Wasp and Common Myna control. These programs will aim to educate and involve local residents in both monitoring (European Wasp and Common Myna) and control activities (Common Myna only) and will be delivered within Offset Areas and adjacent reserves, if required.</p> <p>Works, including invasive animal or plant control programs within Superb Parrot breeding habitat areas must occur outside the breeding season (September to mid January), unless approved by the Conservator.</p> <p>Exclusion of domestic dogs from the Reserve.</p>

TABLE 1: POTENTIAL THREATS TO THE MFWS AND MITIGATION MEASURES (CONTINUED)

Threat	Potential Impacts	Measures that will be used to manage threats
Over-abundant Animals	Impacts on biodiversity of native vegetation communities through grazing and suppression of vegetation regeneration.	<p>There is potential for kangaroos to become over-abundant within the Mulligans Flat and Goorooyaroo Nature Reserves (ACT Government 2010). Kangaroo populations within Canberra Nature Park are managed in accordance with policies outlined in the ACT Kangaroo Management Plan (ACT Government 2010).</p> <p>Following the expansion of the MFWS, the current kangaroo management program operating within the Mulligans Flat and Goorooyaroo Nature Reserves will be expanded to include the Offset Areas.</p>
Inappropriate fire regimes and fire protection measures.	<p>Impacts on the condition of fire sensitive species and communities</p> <p>Damage to ecosystem restoration works.</p>	Science-based plans for biodiversity management and ecosystem restoration of specific ecosystems that will determine appropriate fire regimes and feed into the Reserve's overall fire management plan.
Changed runoff patterns and sediment and nutrients.	<p>Impacts on water quality, aquatic habitats and species in streams.</p> <p>Introduction of weeds and pest species.</p> <p>Changes in moisture and nutrient levels affecting growth conditions and habitat of some species.</p>	Application of high standards of design and runoff management for infrastructure and buildings within the MFWS
Rural tree dieback.	Loss of Eucalypt trees resulting from susceptibility to insect attack as part of a general decline in ecosystem health.	Ecological restoration which will reduce the vulnerability of older trees through improvements to soil structure, vegetation diversity and the range of tree age classes.
Impacts from construction activities in reserve	<p>Damage to vegetation and animal habitat.</p> <p>Impacts on water quality, aquatic habitats and species in streams.</p> <p>Introduction of weeds and pest species, foreign materials.</p>	Construction Environment Management Plans including erosion and sediment controls, protective measures for sensitive areas, waste management procedures and post-construction remediation.
Inappropriate location of trails and infrastructure.	<p>Soil erosion and weed spread.</p> <p>Habitat fragmentation and loss of native animal habitat.</p> <p>Human presence affecting native animals.</p> <p>Damage to Aboriginal sites.</p> <p>Impacts on scenic values and heritage views.</p>	<p>Science-based plans for biodiversity management and ecosystem restoration of specific areas.</p> <p>Trail planning that will take account of impacts on MFWS values and seek to rationalise existing management trails.</p> <p>Conservation management planning for protection of Aboriginal sites.</p> <p>Design principles to protect scenic values.</p> <p>European heritage conservation strategy.</p>

TABLE 1: POTENTIAL THREATS TO THE MFWS AND MITIGATION MEASURES (CONTINUED)

Threat	Potential Impacts	Measures that will be used to manage threats
Disturbance and damage by visitors.	<p>Disturbance of native vegetation and plant and animal habitat, including taking of fallen wood and rocks.</p> <p>Erosion and weed spread.</p> <p>Disturbance of Aboriginal archaeological sites and areas of Aboriginal significance.</p> <p>Roadkill.</p>	<p>Concept planning for trails and visitor nodes that will take account of impacts on values in the location and design of trails and infrastructure.</p> <p>Prohibition on damaging activities such as taking fallen wood and rocks.</p> <p>Conservation management planning for protection of Aboriginal sites, including measures to manage potential visitor impacts.</p> <p>Programs and information to increase visitor awareness and encourage minimal impact behaviour.</p> <p>A small number of management access roads with low speed limits.</p>
Social impacts from unsustainable type and level of visitor use.	<p>Conflicting uses affecting the experience of other visitors and the quality of nature and culture based experiences through noise, speed and crowding.</p> <p>Loss of perception of wildness and tranquillity in nature</p>	<p>Concept planning for trails and visitor nodes that will take account of impacts on Reserve values in the location of trails and infrastructure.</p> <p>Higher impact activities in specific visitor nodes located and designed for this purpose and placement of major visitor facilities outside of the Reserve and at the Learning Centre Precinct.</p> <p>Identification of areas for tranquil, low-key nature-based activities accessed by walking tracks.</p> <p>Programs and information to increase visitor awareness and encourage minimal impact behaviour.</p>
Edge effects along the urban boundary.	<p>Introduction of weeds, domestic animals, impacts on water quality.</p> <p>Fragmentation of plant and animal habitat and ranges.</p> <p>Multiple visitor entry points leading to uncontrolled uses, erosion, weed introduction, informal trails and visitor conflicts.</p>	<p>Management of the urban interface as a buffer to protect the Reserve.</p> <p>Fencing of the Reserve to reduce and manage access to points.</p> <p>A small number of management access roads with low speed limits.</p> <p>Programs and information to increase awareness by residents and visitors of ways to minimise impacts on the Reserve and to encourage development of stewardship for the MFWS</p>



Night time tours are popular for visitors to learn about the reintroduction program, native wildlife and threats to their survival



SECTION 05
OPPORTUNITIES FOR
VISITOR USE

Activities and programs that are consistent with the MFWS vision to restore, learn and inspire will help ensure its values are protected. This section outlines those opportunities.



SUSTAINABLE VISITOR USE

The MFWS is a valuable and long established conservation asset with strong community support. Apart from its significant values, what potentially sets the MFWS apart from other reserves across Australia is the woodland restoration program, the successful reintroduction of rare and endangered species and the community programs aimed at woodland restoration and conserving habitat for threatened wildlife, particularly in a world where ecological habitats are disappearing. Put simply the stars of the show are the woodlands and wildlife that can be brought to life by high quality interpretation, a range of high quality education programs and experiences that show case the unique values of the MFWS.

With improvement in the quality and variety of experiences, the MFWS will provide recreation and nature-based experiences that are rare on the boundary of the major population centre. The importance of the MFWS to the local and regional community as a nature-based recreation, nature appreciation and learning asset will increase over time as the ACT's urban population grows. The importance of retaining the sense of remoteness, solitude and tranquillity will also grow in its importance for visitors wishing to get away and explore nature on their own terms.

The MFWS will offer visitors an experience distinct from other peri-urban reserves in the region through its strong emphasis on restoration activities, learning and stewardship of natural and cultural values. Recreation opportunities will need to be developed and managed in a way that both protects and showcases the nationally significant habitat, ecosystems, scenic landscapes and other natural and cultural heritage.

The level of awareness and the number of visitors who use the MFWS is likely to grow due to its location, and therefore it is important to position the experiences on offer as unique and attractive to the markets who are the *right fit*.

A focus on activities and programs that are consistent with the MFWS vision to restore, learn and inspire will help ensure its values are protected. A schedule of appropriate uses that are consistent with the ongoing protection and restoration of MFWS will ensure the type and scale of activities are suitable. This means that proposals to hold some activities and events may not be accepted as some recreational opportunities are likely to be more compatible with the values of other Canberra Nature Park reserves.

TARGET MARKETS

People who are most likely to use and be interested in the activities and programs of the MFWS are:

- Residents of the surrounding suburbs of Gungahlin
- Residents of ACT and surrounding NSW region
- Interstate and international visitors
- Education market – Scientists and Researchers, Primary, secondary and university students
- Special interest groups, community groups, recreation groups

5.1 RESIDENTS OF THE SURROUNDING SUBURBS OF GUNGAHLIN

Gungahlin-Hall will continue to see the bulk of the ACT's population growth generating 40.7% of the ACT's total population growth over the next few years. This will create opportunities for the MFWS while at the same time creating some pressures⁵.

5.2 RESIDENTS OF THE ACT AND SURROUNDING REGION

The combined estimated resident population of the ACT, Queanbeyan Palerang Regional Council Area and Yass Valley Council Area is currently 485,455. The estimated resident population of the ACT is projected to reach 400,000 by 2017 and 500,000 by 2030⁶, expanding the regional population to around 700,000 by 2035. The Canberra population is expected to continue ageing during this time with those aged 65 and over increasing from 12% of the population in 2012 to 22.5% in 2062⁷. This emphasises the importance of creating accessible experiences for an aging population.

5.3 VISITORS TO THE ACT AND SURROUNDING REGION

The ACT received around four million visitors in the year ending June 2015⁸ including overnight and day visitors. Most of these visitors are domestic with only a small proportion of international visitors. Domestic tourism to the ACT is forecast to grow to 6.5 million

visitor nights by 2025⁹. International tourism is expected to grow at a stronger rate to 8.1 million visitor nights¹⁰.

Interest in nature-based visitation is growing across Australia¹¹ and outdoors and nature is a key experience currently promoted by visitCanberra. Both nature-based and wildlife visitors generally have a higher average length of stay and spend per night compared to regular visitors. With international flights commencing in Canberra in September 2016 the MFWS is well placed to leverage growth from international markets as well as continue to develop experiences that appeal to domestic visitors.

5.4 EDUCATION MARKET

5.4.1 Universities and vocational training

International students are one of the highest value visitor segments in Australia and Canberra is a base to five universities (the University of Canberra, the University of NSW, the Australian Catholic University, Charles Sturt University and the Australian National University – the highest ranked university in Australia), the Canberra Institute of Technology and 117 registered training organisations. The MFWS has the opportunity to leverage its educational experiences through the development of curriculum based programs for schools and through targeted experiences for visitors who come to Canberra to visit friends and relatives (the main visitor market to Canberra).

5.4.2 Primary Schools

There are 21,473 primary students, 9,912 high school (year 7–10) students and 6,014 college students enrolled in ACT public schools.¹² Note that this figure does not include private schools in the region. There are 13,570 public school students located within approximately 1.5 hours' drive of the Extended MFWS¹³ in NSW. Of these, 7,523 are primary school students, 4,681 are high school students and 1,366 attend one of three central schools (Kindergarten to Year 12)¹⁴.

5 ACT Government ACT Population Projections 2007 – 2019

6 ACT Government ACT Population Projections 2007 – 2019

7 ACT Government <http://treasury.act.gov.au/demography/projections/act/total>

8 Visit Canberra 2015

9 Tourism Research Australia, State Tourism Forecasts, July 2014.

10 Ibid

11 Tourism Research Australia, Summary of Nature Based Tourism Research in Australia, 2014

12 Department of Education and Training *ACT School Census*, 2014

13 Within the "Queanbeyan" and "Southern Tablelands" clusters

14 <http://www.teach.nsw.edu.au/documents/2015%20-%20DGS14-253-Website%20Enrolment%20Information.pdf>



5.4.3 Secondary Schools

In 2014, the Foundation to Year 10 Australian Curriculum was implemented in all states and territories of Australia. It includes learning areas, general capabilities and cross-curriculum priorities that together support 21st century learning.

There are eight learning areas: English, Mathematics, Science, Humanities and Social Sciences, The Arts, Technologies, Health and Physical Education, Languages and Work Studies. In addition to the learning areas, the Australian Curriculum pays explicit attention to how seven general capabilities and three cross-curriculum priorities contribute to and can be developed through each learning area. One of the three cross curriculum priorities is Sustainability. The MFWS is well placed to provide education material and experiences to support this part of the curriculum.

5.4.4 ACT Visiting Schools Program

A total of 160,681 primary and secondary school students visited Canberra in 2012–13 for educational tourism. In 2012, the direct economic impact in the ACT as a result of interstate school excursions was valued at \$105 million. Seventy per cent of the visiting students are primary school students.

In a joint venture partnership with the National Capital Attractions Association (NCAA), visitCanberra supports the activities of the National Capital Educational Tourism Project (NCETP) to market Canberra as an educational tourism destination. The education market in the ACT is a large and highly organised market.

The top attractions that schools visit are Parliament House, the War Memorial, Questacon and The Australian Institute of Sport. To interest schools, attractions have to be strong and compelling and target the right year level. NCETP has 20 main products available – the average school stays three nights and only has time for 12 of these products.

Schools plan and book with long lead times – a year ahead is quite common, as once schools have their schedule developed to suit, they rebook as they leave. The visitation trend is positive with annual student visitors increasing 35% since 2001, but the increase is limited by capacity at the major attractions. Once an attraction like Parliament House is fully booked, schools stop booking for that period because they are not prepared to visit Canberra and miss one of the primary attractions. Night time activities are of particular interest for schools as there is a shortage within the ACT. The MFWS is well placed to partner with attractions such as Questacon and leverage the opportunity to encourage education experiences as part of the NCETP, particularly night time activities such as Twilight Tours.

A summary of the potential markets, attributes and experiences/products that could be offered at MFWS and that are consistent with the vision to restore, learn and inspire are summarised in Table 2.

TABLE 2: TARGET MARKETS – EXTENDED SANCTUARY

Segment	Experience preferences	Potential Opportunities in MFWS
Young Families	A half day for parents, accessible from Canberra. Families visiting ACT and region – seeking activities for young children.	Day or ½ day outing near to home or accommodation and close to communities with activities suitable for children (adventure playground, short accessible walks, close to amenities). Hands-on experiential activities if available. Short walk and cycle opportunities to view wildlife. Adventure activities and interpretation suitable for young children. My Sanctuary Passport – for repeat visits
Older Families	A half day to a day for parents, accessible from Canberra.	Day or ½ day outing near to home or accommodation. Discovery and adventure style activities – online interpretation. Walking and cycling opportunities. Adventure and Interpretation suitable for secondary school /young adults.
SINKS/ DINKS	Half day accessible from Canberra region Different immersive, authentic, less discovered experiences.	Short and day experiences with sense of discovery – freedom to explore without time constraints. Wildlife and cultural activities, experience wilderness – volunteer activities
Retirees	Authentic experiences ‘off the beaten track’. May be constrained by physical capability.	Short and half day experiences. Walking and cycling opportunities. Interpretation and hands on experiential programs. Wildlife and cultural activities – volunteer activities
Local Residents	Health and well-being opportunities	1/2 day activities with a variety of places to see and activities to participate in for visiting friends and relatives
Local Schools	Day excursion for schools in local region as part of curriculum	Access to sites that enable students to learn and discuss issues that contribute to the educational experience – e.g. viewing areas and good interpretation off site and interactive learning experiences through site visits and via ICT. Access to amenities.
Visiting Schools	Short stopover to provide a break in journey for schools visiting from elsewhere that links into education programs. Can also be included in the National Capital Educational Tourism Program.	Access to sites that enable students to learn and discuss issues that contribute to the educational experience – e.g. viewing areas, good interpretation off site, and interactive learning experiences through site visits and via ICT. Access to amenities. Promote night-time activity to visiting schools, as very little available elsewhere for school groups in the evenings.
Special Interest Groups	Coach tour, business, special interest or conference groups seeking to visit reserve or conduct group activities to complement training and/ or research.	Access to viewing areas/points of interest. Short to ½ day excursions suitable for all group members and allowing group interaction. Sites need to be accessible with car/ coach parking. Access to site for interaction with staff.
Event participants	Small events involving special interest groups.	Subject to the type and scale of activity, small events may be permissible.
Cycle Tourists	Easy to moderately challenging road and hard-packed, well-formed off-road trails. Weekend road cyclists with fitness and challenge as key motivators.	Access to points of interest and Centenary Trail. Links to local and regional network.
Community Conservation	Activities that support learning and restoration of the MFWS	Active participant in research and education programs – opportunities for volunteer activities and share knowledge

Achieving sustainable visitor use

Visitors will have opportunities to experience the MFWS in a variety of ways such as quiet nature appreciation, active outdoor recreation, guided experiences, learning and education programs, and volunteer activities.

In order to achieve the vision for the MFWS and long term sustainable recreation there needs to be a selective approach to the types of recreational opportunities offered. Not all visitor uses will be compatible with protection and visitor appreciation of threatened species and ecological communities or with ecosystem restoration activities and research.

Sustainable visitor use will be achieved in the following ways:

- offer activities and experiences that are low intensity conducted with minimal environmental impact in recognition of the natural and cultural and scientific values of the place
- use of zones to guide management of visitor use and management activities to ensure conservation and restoration objectives are not compromised
- concentration of facilities for larger numbers of visitors and higher intensity uses in two visitor nodes – in the short term at the Woolshed (via the Forde Entrance) and medium to long term at the Woodland Learning Centre (via the Throsby entrance)
- providing quality, contemporary interpretation and learning experiences that encourage visitor appreciation of the MFWS's values
- location, design and construction of visitor infrastructure and trails in a way that minimises impacts on natural and cultural values and is sensitive to the landscape while providing quality opportunities for a range of visitors to experience and appreciate those values
- avoidance of high intensity or environmentally damaging visitor uses and activities that are more appropriately located in urban parks or other facilities in the region.
- promoting the MFWS's vision and information about sustainable, low impact recreational use to the local community, visitors and user groups to encourage understanding, responsible behaviour and stewardship
- offering exclusive experiences which give visitors opportunities to do something different. Such experiences might include voluntary activities participating in monitoring and research, commercial nature and cultural tours.

Table 3 summarises the management considerations associated with recreation activities in the MFWS.



TABLE 3: MANAGEMENT CONSIDERATIONS – RECREATION

Visitor Use/Activity	Management Considerations
Quiet observation and nature appreciation (such as bird watching, wildlife watching, visiting scenic and natural sites, photography, painting)	<p>This activity will be encouraged through provision of quality interpretation and visitor learning and volunteer programs.</p> <p>Potential for impacts such as vegetation trampling, interference with habitat, ecosystem restoration sites and Aboriginal sites will be managed through sensitive location of trails and viewing points, selective fencing of sensitive sites where appropriate, and visitor education in minimal impact behaviour.</p> <p>As appropriate facilities such as scenic view points and bird hides will be provided.</p>
Walking and bushwalking	<p>Sustainable walking and bushwalking will be encouraged through provision of a range of walking trails and collaboration with walking groups and programs that facilitate active living. It is proposed to provide a range of trails for different levels of visitor mobility and preferences to showcase and interpret the values of the MFWS. Trails suitable for disability users, wheelchairs, children, families and seniors will be provided from the main entrance to the MFWS – the Woodland Learning Centre. More remote walking experiences will be provided throughout the MFWS for visitors to enjoy the wild and remote areas of MFWS.</p> <p>Potential for impacts such as vegetation trampling, interference with habitat and wildlife, ecosystem restoration sites and Aboriginal sites will be managed through sensitive location of trails and viewing points, selective fencing of sensitive sites where appropriate and visitor education on minimal impact behaviour. Walkers will be encouraged to keep to the formed trails.</p> <p>Walker-only trails will be provided so that walkers are able to enjoy the tranquil qualities of the away from cyclists.</p>
Cycling	<p>Cycling will be able to occur on shared trails to visitor nodes. This will provide cyclists with opportunities to travel to the main visitor nodes.</p> <p>Cycling will not be permitted on walking only trails. Cyclists will be required to exercise minimal impact behaviour.</p>
Picnicking	<p>Picnicking is an important way for visitors to enjoy nature and scenic landscapes and is often conducted in association with other activities.</p> <p>Picnicking facilities, car parking and shelters will be provided at the Learning Centre visitor nodes, with facilities for large groups concentrated at this point.</p>
Camping (optional and managed)	<p>The MFWS will be primarily a day use area. Small group camping for wildlife experience may be considered subject to assessment of impacts and permit or licence approvals.</p> <p>Camping as part of Aboriginal cultural activities may be considered under arrangements with the Aboriginal community and subject to environmental protection measures.</p>
Events, functions and large group activities	<p>Certain types of events and large group activities may be appropriate and will be subject to the issue of permits once an event management framework has been developed and facilities for these activities are in place.</p> <p>An alternative route for the Centenary Trail available for use for major events to avoid using the MFWS is recommended.</p>
Commercial tours, products and services	<p>Commercial activities (such as guided nature and culture tours, ecotourism experiences, voluntourism, education activities and facilities for functions) may be permitted subject to approval and licence conditions</p>
Visitation and congestion in certain areas	<p>Given the extent of population growth in the area forecast for the next ten years it is likely that the MFWS will become too popular and loved to the point that values may be compromised. To ensure that this is managed effectively a systematic visitor impact monitoring program is implemented and reviewed on a biannual basis.</p>



The topography of the Sanctuary makes it easy walking for visitors along existing tracks and trails



SECTION 06
THE CONCEPT PLAN

The Concept Plan presents practical opportunities to deliver the overall vision for the MFWS.

VISION

Mulligans Flat Woodlands Sanctuary: restoring our nature, transforming our thinking and inspiring action for conservation

A key element of the vision is developing a broad range of experiences and active programs that support the key themes of restoring, learning and inspiring.

The vision is reinforced by a set of objectives for the management of the MFWS as follows:

RESTORE

- The ecosystems we manage are moved towards a state of natural ecological function through the recovery and conservation of biological components and management of threats.
- Aboriginal people connect to country through involvement and employment in targeted land management programs and participation in decision making.
- Our community, government, business and scientific partnerships maximise local, national and international impact within and beyond the MFWS and are continually refined and developed.

LEARN

- We research new approaches to land management, species introductions, population management and community engagement with our institutional and community partners to deliver long term ecological and operational outcomes.
- We connect a diverse community with nature through opportunities for learning, play, recreation, story-telling and through experiences that inspire a desire to care for and appreciate the natural and cultural environment.
- We exchange knowledge with the broader Canberra Nature Park and beyond through a MFWS-specific conference, annual community forums, scientific papers, management information sheets and our outreach programs.

INSPIRE

- We change people's perceptions of what can be achieved through ecological restoration and inspire them to value and support an enhanced natural environment.
- We pursue every opportunity to educate the community and decision makers on the vision for, and the special value of, the MFWS and the lessons learnt about the management of its values
- We encourage community and individual wellbeing and enjoyment of nature through new experiences and enhancement of its perceived wildness.
- We share our achievements widely, demonstrating Australia's best restoration and management of woodland communities – inspiring action elsewhere.

CONCEPT PLAN

Base line investigations, the adopted vision and objectives together with the evaluation of opportunities and constraints have led to the distillation of concepts. In effect, these concepts translate the vision and objectives into site specific design responses. They are summarized and presented graphically in this section to assist in understanding the concept.

“No one will protect what they don’t care about, and no one will care about what they have never experienced.” – Sir David Attenborough

At a high level the concepts provide for:

- active conservation and restoration of the area’s key natural values as a centrepiece of the MFWS concept
- a zoning scheme that reflects the diversity and nature of the landscape and safeguards the ongoing restoration and research programs across a range of recreation settings
- a diverse range of experiences that are distinctive to MFWS and that showcase it as Australia’s most outstanding example of woodland biodiversity conservation
- a hierarchy of visitor precincts and distinctive places which respond to the natural attributes and qualities of the MFWS
- site specific environmental education and interpretive programs to promote understanding of the site and support for MFWS initiatives supported by learning anchors at the existing Woolshed and the new Woodlands Learning Centre
- a hierarchy of paths/trails along and across the MFWS that emanate from the Woodland Learning Centre and Woolshed, taking in landscape features and distinctive places
- protection of cultural values through onsite conservation supported by localised interpretation designed by traditional custodians

- a choice of circulation, circuits and connections to support access, use and management
- establishment of a strong brand that capitalises on the site’s values and uses community participation, interpretation, promotion and education to identify the MFWS and tell its story.

MANAGEMENT ZONES AND VISITOR PRECINCTS

Zoning is a means of expressing landscape and environmental management priorities for particular areas in the MFWS. The main purpose of zoning is to specify the appropriate levels and forms of access (particularly for recreation) and associated facilities and management requirements in particular areas. It will also help to ensure that the Trust and the ACT Government meets its management obligations associated with the protection and enhancement of the MFWS natural and cultural values and commitments associated with the EPBC Act.

6.1 MANAGEMENT ZONES

The whole of MFWS is considered a conservation reserve and therefore the entire reserve has been zoned Core Conservation for the purposes of this concept plan.

The core conservation zone consists of:

- high biodiversity and landscape values
- nationally threatened ecosystems
- important habitat for threatened species
- a high density of threatened species
- a high number and/or diversity of rare and uncommon species
- locations where woodland bird species are breeding and which are sensitive to disturbance
- ACT Heritage Register cultural sites
- significant geological sites
- regenerating areas
- areas relatively undisturbed for an extended period

6.2 EPBC HABITAT AREAS

Habitat areas as outlined in the Throsby Offset Management Plan¹⁵ and included in the core conservation zone are:

- Woodland Restoration Habitat Area – conserve and rehabilitate the extent and understorey condition of yellow box-red gum grassy woodland
- Golden Sun Moth Habitat Area – to conserve and rehabilitate the extent of golden sun moth
- Striped Legless Lizard Habitat Area conserve and rehabilitate the striped legless lizard habitat
- Superb Parrot Habitat Area – to maintain a breeding population of superb parrot.

6.3 VISITOR PRECINCTS

A hierarchy of activity settings providing different levels and types of visitor activities and experiences are included in the concept plan. The natural assets of the site have been used to provide recreation experiences catering for a variety of uses that contrast and complement those in adjacent areas. From these precincts visitors are encouraged to explore the various activity nodes.

- a. **Experience Precinct** – In this precinct the focus is on learning and education close to key visitor nodes of the Woodland Learning Centre and the Woolshed. This precinct will focus on facilitating opportunities for all to experience and connect with nature. It will offer a range of visitor facilities, short accessible paths, interpretation and education opportunities. The protection of habitat for the Golden Sun Moth will be an overriding consideration in this precinct.

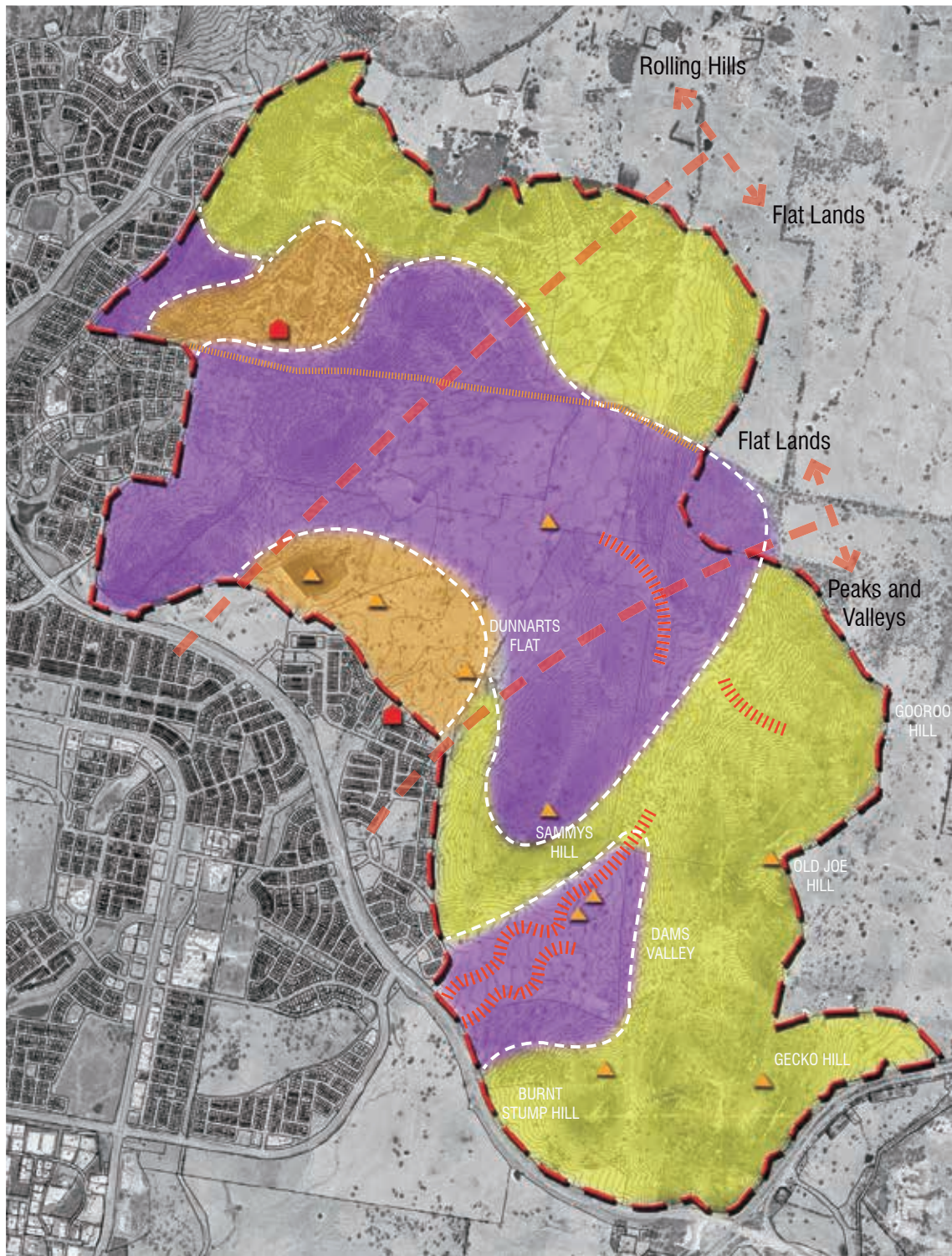
- b. **Discovery Precinct** – In this precinct the focus is on self-guided discovery and adventure in nature. This precinct will aim to inspire conservation through showcasing the restoration activities in the MFWS and creating lifelong personal connections and commitments to conservation action. This precinct will provide for walking, cycling, small events, and longer trails, interpretation and education opportunities.
- c. **Wild Precinct** – in this precinct visitors are free to roam and explore the wildness where *self-reliance and solitude is encouraged*. There will be minimal infrastructure in this precinct.

The zoning framework is illustrated in Figure 11. The zoning framework as it relates to the core values of the Sanctuary is illustrated in Figure 12.



15 ACT Government, Extension to the Mulligans Flat and Goorooyarroo Nature Reserves, Draft Offset Management Plan (for the Throsby North, Throsby East and Kenny Broadacre Offset Areas), Commitments 10 within the Gungahlin Strategic Assessment Biodiversity Plan, July 2015

FIGURE 11: ZONING FRAMEWORK



Legend






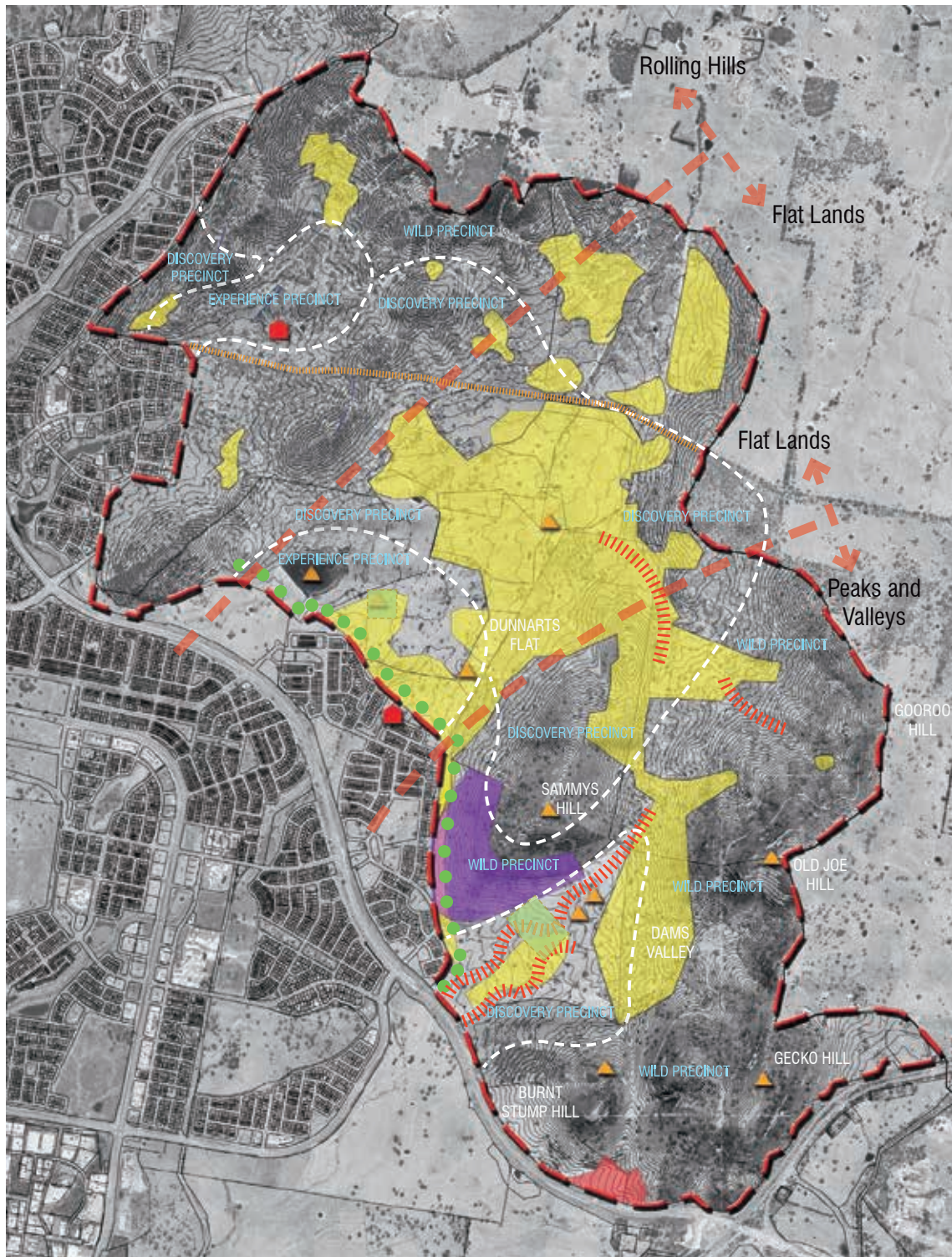
-  Site Boundary / Core Conservation Zone
-  Experience Precinct
-  Discovery Precinct
-  Wild Precinct
-  Erosion Restoration Area
-  Woodland Learning Centre and Woolshed locations
-  Destinations
-  Old Coach Road

FIGURE 12: ZONING FRAMEWORK



Legend

-  Site Boundary / Core Conservation Zone
-  Buffer Zone
-  Erosion Restoration Area
-  Woodland Learning Centre and Woolshed locations
-  Destinations
-  Ploughed Lands
-  Old Coach Road
-  Golden Sun Moth Habitat
-  Superb Parrot Breeding Habitat
-  Striped Legless Lizard Habitat



SPECIFIC ELEMENTS OF THE CONCEPT PLAN

The key concepts are illustrated in Figure 13 and 14 and described below.

THE HUBS – WOODLAND LEARNING CENTRE AND WOOLSHED

The Hubs are the anchor point of the interpretation experience. Ideally a visitor will pass through a hub before entering the reserve, although it isn't essential. The primary hub (while the Learning Centre is being developed) will be the Woolshed. This is an opportunity to introduce the major themes of the interpretation, and orient the visitor to the range of experiences they can have. The objective is to introduce the big ideas and then let the outdoor signage and interpretation tell the specific stories (Figure 15).

The Woolshed walls would be redeveloped with moderate interactive experiences and rich visual depictions of systems and animals. A large orientation map, possibly animated, would create a centrepiece for helping visitors plan their day. The Learning Centre will play a similar role on a larger scale.





ORIENTATION

At each entrance-way to the reserve, within the hubs and potentially at other key way-finding junctions, are large 3-dimensional bronze terrain maps of the reserve that show all major landmarks, walking/biking tracks, distances and estimated times. The maps are anchor points for orientation and also provide a tactile representation of the hills and valleys to aid walking/biking decisions.

DESTINATION LOOPS

The MFWS has a wonderful selection of trails to explore, however with the exception of the Bird Walk, no focal destination point. By introducing a small number of 'destinations' tracks and trails take on more meaning, and people can take short, half day or full day walks. The destinations and associated experiences are illustrated in Figure 16.

The Destinations Loops are walking loops with a particular interactive, or story based destination as their goal. They extend out from the hubs and orientation maps and have a specific travel arc, but the interpretation along the way can be varied in terms of themes and storylines (See Interpretation Strategy).

A key ingredient of the concept plan is to find and share the fun in nature and enable people to engage with it on their own terms

The following destination loops are proposed:

- **Wildlife Walk**
This is a loop/walk with a specific focus on the wildlife, and is also shortened as the Night Tour
- **The Dam/Bird Walk**
Following the existing Bird Walk this culminates with the Dam/Viewing area. The dam is based on the current concept to develop a boardwalk and hides around the dam, and also uses the current Bird Walk as a preferred loop. The hides have viewing slots and interpretation about the wetlands and birdlife that can be seen here (Figure 16).
- **Heritage Loop**
Following the Old Coach Road the destination is the outline of a homestead with stories of farming and travelling through this region. The Old Coach Road and the Homestead provide a snapshot of living off this landscape over the past 200 years.

Developing a set of sculptural outlines of buildings that indicate the types of homes and working environments will support the experience.

Interpretation can be added to these structures with a light footprint. These are primarily located at the site of the homestead, but also ploughs and other implements could be part constructed at other sites around the reserve (Figure 16).

- **The Stag / Regeneration Zone**
A tree-house experience with a viewing platform is an interactive destination that explores above and below ground and tells the story of the regeneration of the ecosystem (Figure 16).

▪ Sammy's Hill View

The view from the top of the hill is a space for contemplation, but also an indigenous-centric view of the landscape. The storytelling can be designed to take visitors back in time to contemplate the timescales and movements of people through the view in front of them. Another story that can be depicted from Sammy's Hill is the encroachment of urbanisation. This could be illustrated well with photos and maps showing the view with no Gungahlin, Gungahlin in development and today. The trails that surround Sammy's Hill are a more difficult walk for some, but provide the rewarding view-shafts that accompany this (Figure 16).

ENTRY AND ORIENTATION POINTS

The gates need to be developed as orientation moments. They need to be clearly distinguishable, and need to reinforce to the visitor where they have come from and where they are going. Wayfinding bollards are located here and at key junctions with directions, distances and a schematic.

Each entry, service vehicle and pedestrian access point are separated with inclusion of signage information and seating areas adjacent to the pedestrian entry. This will formalise the appearance dramatically and

highlight the pedestrian access as the main access. Additionally, it also provides an area to educate visitors prior to entering through signage and other interpretation means (Figure 17). An alternative fence alignment to soften the visual impact and allow for an alternative route for the Centenary Trail is presented in Figure 17.

TRAIL SIGNAGE

The trail signage will be developed at specific locations along each of the destination loops. The themes and storylines allow for multiple types of interpretation at each signage/ viewshaft point. Certain signs will have indications that they are part of a mobile/audio tour. Also, a modular seasonal information panel will be updated when required to draw attention to seasonal changes.

ONLINE EXPERIENCES

The online experience is primarily a marketing tool that describes how a day might be spent at the reserve. It is also a place to delve deeper into research, and also a fun place to explore the stories of the animals of the reserve using the animated character technique. The mobile version of the website will be a guided tour that will provide multiple perspectives along a set route of the trail. Voices of rangers, scientists, conservationists,





children, indigenous perspectives and the animals themselves will be used. The mobile experience will be the device to encourage visitors to name the landscape for themselves.

NEW TOUR CONTENT – NIGHT TIME ACTIVITIES AND CULTURAL PROGRAMS.

The Night Tours are currently run as a two-hour guided walk with a specific focus on spotting animals. This works very well, especially for children, but could benefit from a slight adjustment to add a story arc at set locations along the route. At the moment, it can become a repetitive exercise in animal-spotting and just needs a more location centric story adaptation. The two-hour walk would have specific points along the way where a story gradually unfolds about the reserve, the animals and regeneration projects and the cultural landscape.

EVENTS AND CULTURAL EXPERIENCES

In the space in front of the new Learning Centre, a shallow amphitheatre can be used to host visitors for talks and events, and for performances. This space is the central gathering point for outdoor activities. It could be a covered space, but needs to be developed in conjunction with the architecture of the Learning Centre.

CAMPING

In the longer term, subject to full testing and cost/benefit analysis, opportunities such as establishing a managed camping opportunity and refreshing a range of interactive guided walks and cycle tours to build the level of interactive activities on site provide further opportunities to expand the range of experiences on offer.

In terms of deliverability, partnership is central to the MFWS's future. Once the MFWS is established in the marketplace, a number of elements have the potential to attract commercial partners and generate new revenue streams.

IMPLEMENTATION

The overall concept is that successful implementation will involve a series of priority actions considered necessary to establish the MFWS with core facilities and programs. Medium and longer term deliverables will continue to broaden the range of programs and experiences on offer.

These deliverables focus on expanding the range of experiences which the MFWS can provide to target visitor markets. Some proposals are also relatively quick wins which are deliverable with modest investment, while other proposed developments are more ambitious.

FIGURE 13: CONCEPT PLAN

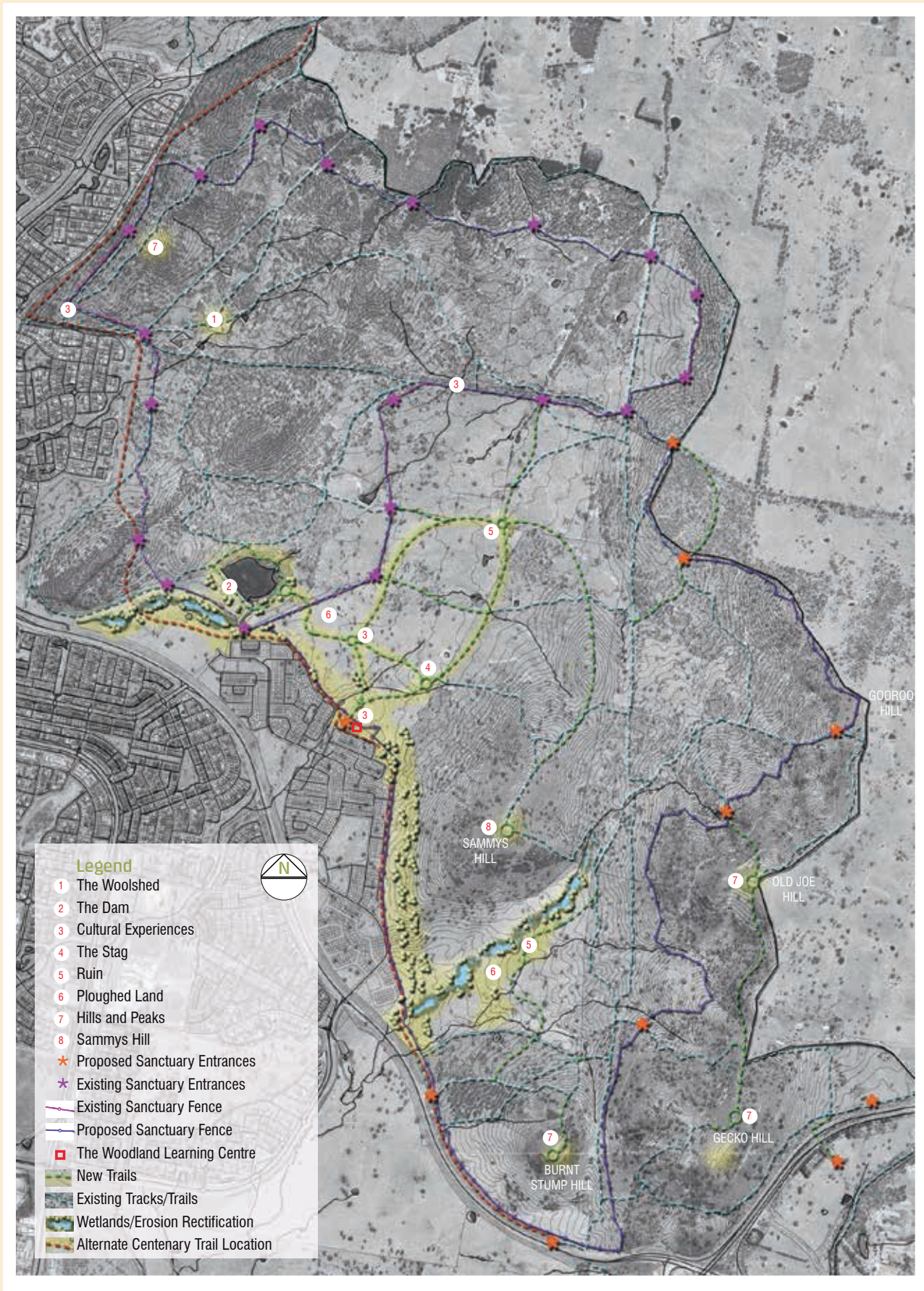
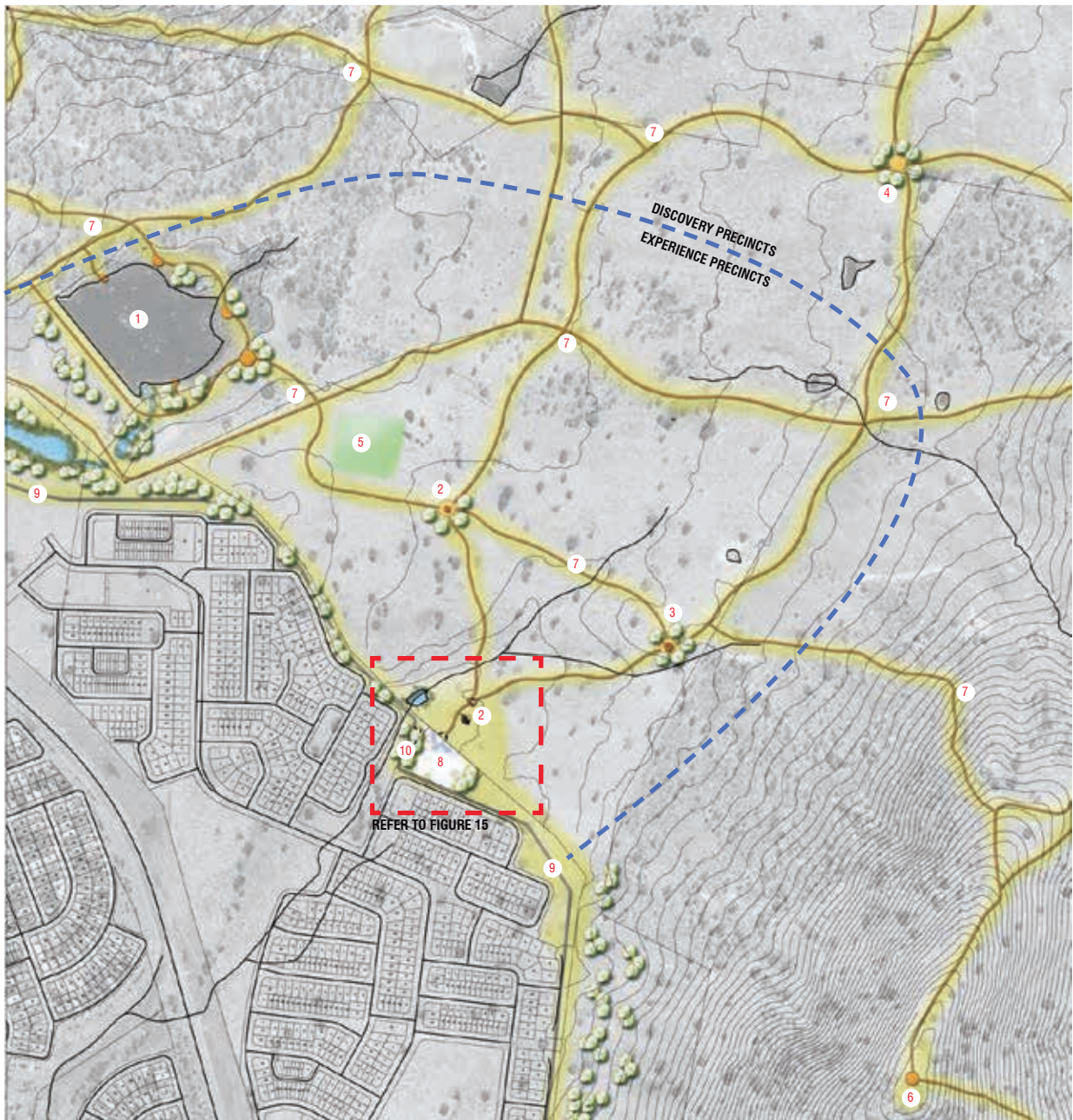


FIGURE 14: CONCEPT PLAN – EXPERIENCE PRECINCTS



Legend

- 1 The Dam
- 2 Cultural Experiences
- 3 The Stag
- 4 Ruin
- 5 Ploughed Land
- 6 Sammys Hill
- 7 Path Network
- 8 The Woodland Learning Centre
- 9 Alternate Centenary Trail Location
- 10 Adventure/Natural Play Area



Design Notes:

The Dam - enhance the Dam with a network of pedestrian friendly paths, seating areas and educational interpretations thereby optimising the area for bird watching, visitation and relaxation.

Cultural Experiences - hubs with educational interpretation about both European and Indigenous influences.

The Stag - a tree house like structure for elevated viewing of the MFWS and interactive education.

Ruin - a destination providing a snapshot of Europeans living in the area over the past 200 years.

Ploughed Land - a destination showing a scar in the landscape illustrating farming practices in past years.

Sammys Hill - point of interest and destination giving substantial views of the MFWS and providing users a point of learning, relaxation and contemplation.

Path Network - paths within the experience zone should aim to be constructed in a way that users of all physical abilities can experience the MFWS and its key destinations. Path alignments have utilise existing tracks where appropriate and taken into consideration existing threatened flora and fauna. Path networks across the site should be consolidated and areas regenerated.

FIGURE 15: LEARNING CENTRE ENVIRONS



Legend

- 1 Dam
- 2 Picnic Area
- 3 Adventure / Natural Play Area
- 4 Map/Interpretation Area
- 5 Amphitheatre
- 6 The Woodland Learning Centre
- 7 Alternate Centenary Trail Location



Design Notes:

Dam - enhance the Dam providing an opportunity to utilise the dam as a education resource for school groups etc

Picnic Area - outdoor picnic area with log seating arrangements.

Adventure/Natural Play Area - a naturalised themed children's playground.

Map/Interpretation Area - an informative area for visitors providing maps, directions to key destinations and return times.

Amphitheatre - an area for talks, performances and tour meetings point.

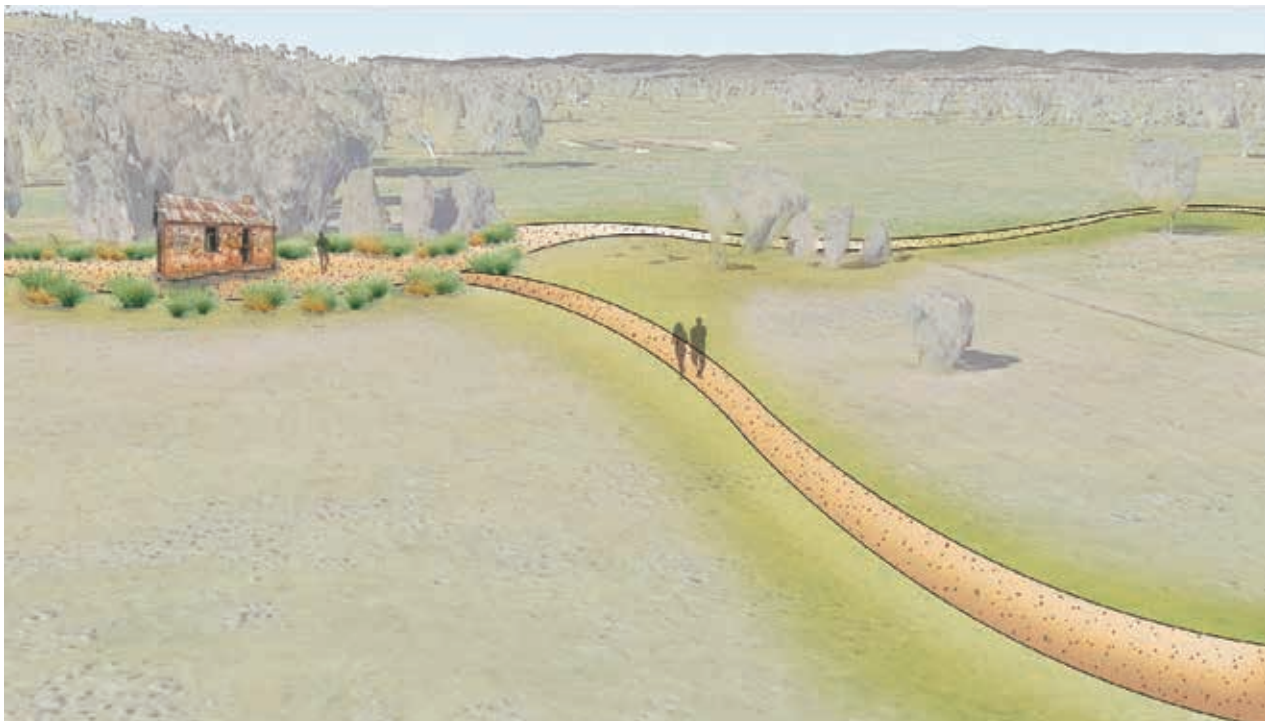
Aboriginal Heritage Site - an area identified as being of Indigenous importance.

FIGURE 16: VISITOR EXPERIENCES



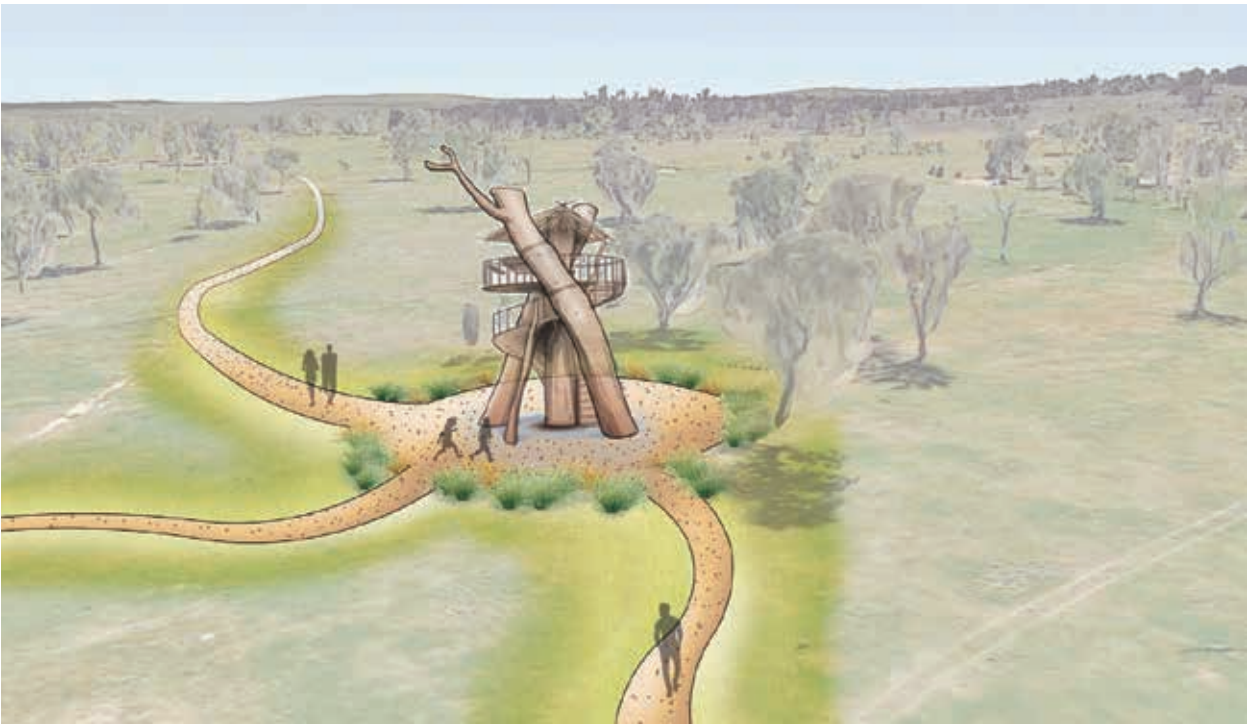
The Dam

Enhance the Dam with a network of pedestrian friendly paths, seating areas and educational interpretations thereby optimising the area for bird watching, visitation and relaxation.



The Ruin - Inglewood Homestead

A snapshot of Europeans living in the area over the past 200 years. Opportunity to embrace this by reconstructing part of the ruin to show visitors what it once would have looked like.



The Stag

Tree house like structure for elevated viewing of the MFWS and interactive education.



Hill Peaks - Sammys Hill

A lookout area giving substantial views of the Reserve and providing users points of relaxation and contemplation. Each area to include seating and interpretive information.



Mulligan's Ploughedlands

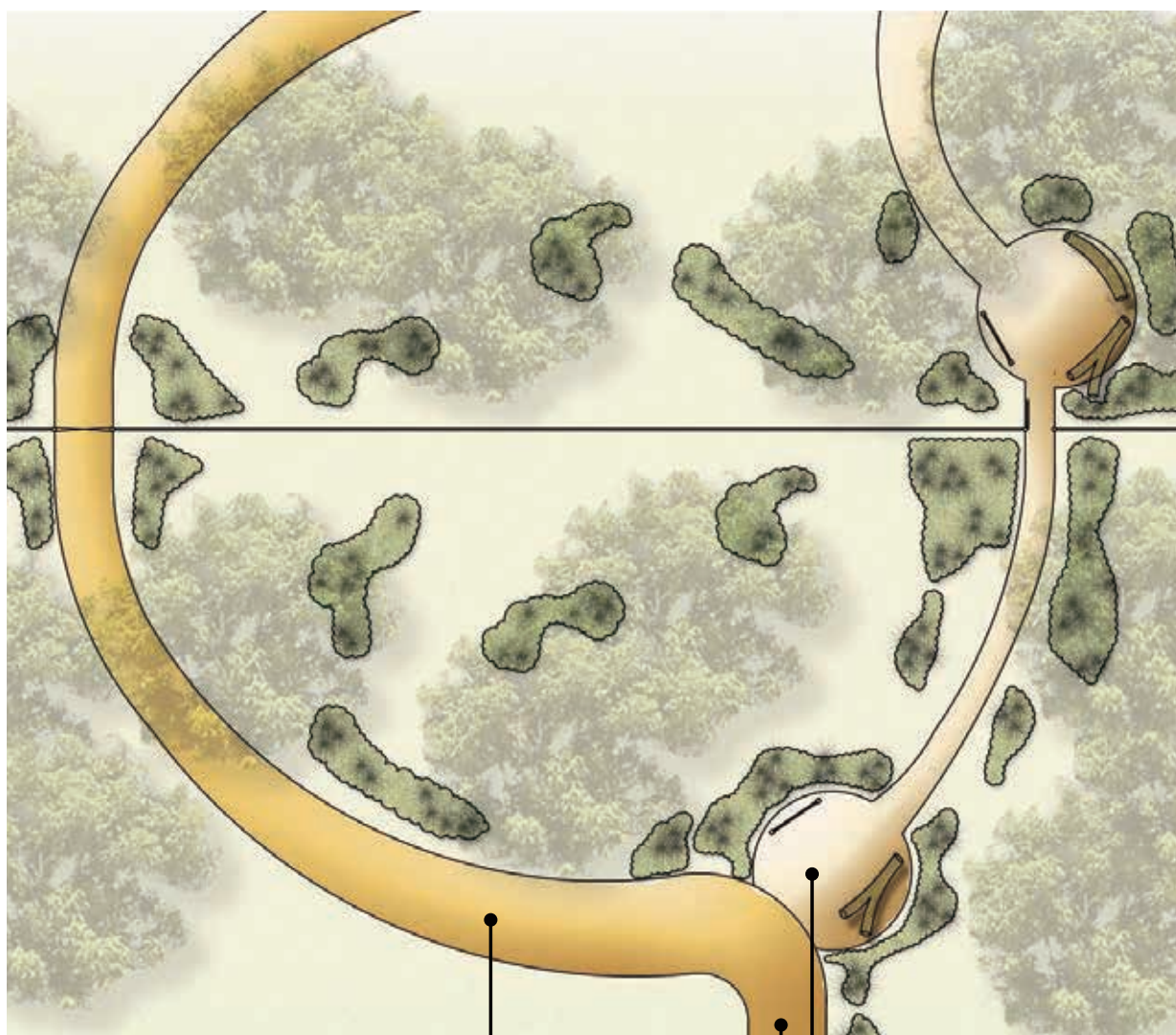
Destination showing a scar in the landscape illustrating farming practices in past years. Area can be enhanced with sculptural elements and old machinery depicting how the land was once farmed



Sullivan's Creek Ploughedlands

Destination showing a scar in the landscape illustrating farming practices in past years. Area can be enhanced with sculptural elements and old machinery depicting how the land was once farmed and include education on the erosion restoration on the creek.

FIGURE 17: GATE ENTRY CONCEPT



Entry Gate Concept - Indicative Layout

Seating/meeting area to entries with signage/information to enhance pedestrian entrances into MFWS.

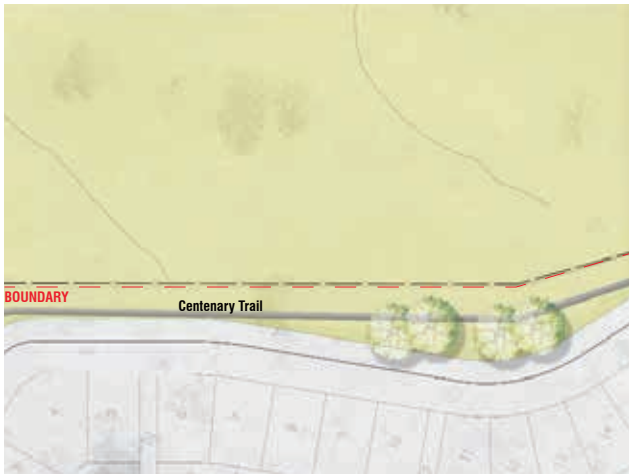
Shared user path

Vehicle service entry separate from pedestrian at entry gates. Gates to be 50m minimum in order to maintain adequate fencing tension.

Design Notes:

The industrial appearance of the entry gates into the MFWS are not all that visually appealing and do not entice people to enter, or give a perception that you are not welcome through the gates. To rectify this, it is proposed that at each entry, service vehicle and pedestrian access are separated with inclusion of signage information and seating areas adjacent to the pedestrian entry. This will formalise the appearance dramatically and highlight the pedestrian access as the main access. Additionally, it also provides an area to educate visitors prior to entering through signage and other interpretation means.

FIGURE 18: ALTERNATIVE SANCTUARY FENCE LOCATION - THROSBY BOUNDARY



Fence - at Boundary



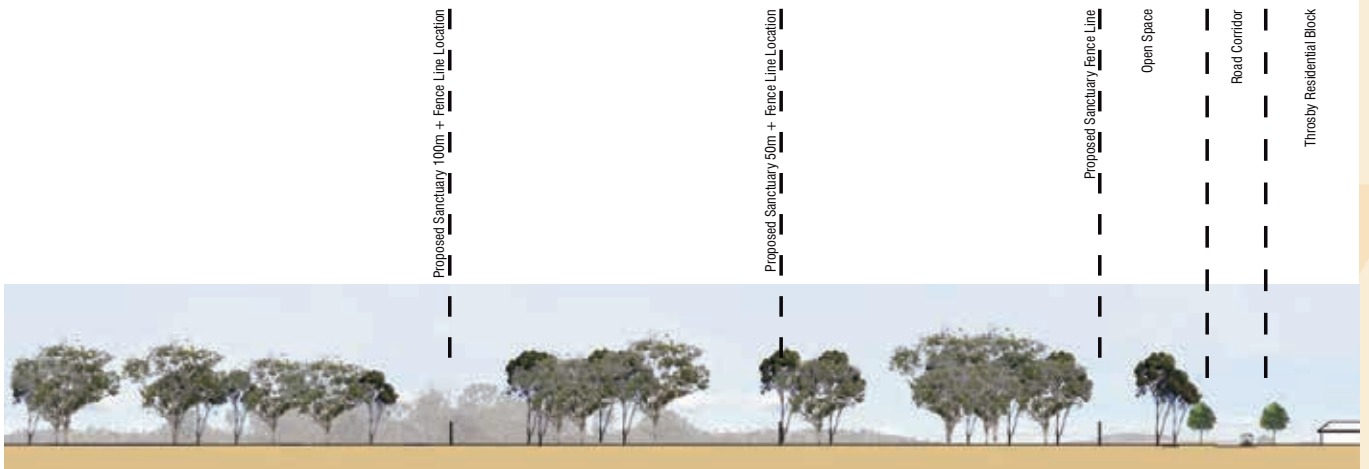
Fence - 50m Offset From Boundary



Fence - 50m to 100m From Boundary

Design Notes:

Having the proposed sanctuary fence offset from the Throsby boundary would be preferable for visual/aesthetic benefits for both the MFWS and Throsby residents. A sanctuary fence offset will enable a vegetative buffer to be established on both sides of the fence there by filtering the view of the fence from the Throsby side whilst creating a vegetative filter of the residential estate from the Sanctuary side. Additionally, an increased buffer will allow for provision of the Centenary Trail relocation.



Sanctuary Fence Offset - Throsby Residential Development Extents



Neighbouring land in NSW is used for agriculture and farming activities



APPENDICES

APPENDIX 1

MANAGEMENT ROLES AND RESPONSIBILITIES

Agency	Role	Accountability
Environment and Planning Directorate – Parks and Conservation Service	<p>Custodian and manager of Offset Areas and adjoining reserves (including the Mulligans Flat Woodlands Sanctuary).</p> <p>Develop and implement fire management plans to manage bushfire fuels and limit the spread of fire on and from land managed by ACT Parks and Conservation Service.</p>	<ul style="list-style-type: none"> ▪ Implement this Plan ▪ Use the results of the monitoring program to evaluate and refine management actions within this Plan ▪ Periodically review progress against condition improvement targets ▪ Ensure all internal and external reporting requirements are met ▪ Ensure that all relevant records are effectively maintained ▪ Ensure that staff and contractors are appropriately qualified, licensed and experienced to undertake the tasks described in this Plan ▪ Provide training and support for volunteer Park Care (Friends of Mulligans Flat) activities ▪ Advise and assist to develop and implement the Bushfire Risk Management Strategy (section 5)
Environment and Planning Directorate – Conservation Planning and Research	<p>Conducts research on local flora and fauna, prepares scientific advice on ecological and natural resource management, conducts ecological surveys, biodiversity monitoring, and prepares and guides the implementation of threatened species recovery plans and the reintroduction of rare species into the ACT.</p>	<ul style="list-style-type: none"> ▪ Develop a plan to implement research on the MNES protected within the Offset Areas ▪ Co-ordinate research projects that require the services of external providers ▪ Provide advice and assist to deliver research projects where the ACT Government are the delivery agents ▪ Assist TAMS staff to interpret results from MNES monitoring programs and provide recommendations on how to adjust land management strategies as is required to deliver the commitments in the GSA Plan and in line with the adaptive management strategy (section 9) ▪ Implement the Throsby Offsets Management Plan and report to the Commonwealth on progress of the management commitments ▪ Provide advice, as is required by TAMS staff, on the on-going management of the conservation values within the Offset Areas
Mulligans Flat Woodland Sanctuary Sub-Committee	<p>The Mulligans Flat Woodland Sanctuary Sub-Committee is a sub-committee of the Woodlands and Wetlands Trust. It contributes expert and community advice on the management of Mulligans Flat and related areas, in partnership with the ACT Parks and Conservation Service. A Species Management Panel and other specialist groups assist the Sub-Committee.</p>	<ul style="list-style-type: none"> ▪ Support for Friends of Mulligans Flat ▪ Provides expert and community advice to TAMS staff on the management of the conservation values within the Offset Areas ▪ Contribute towards the development of the research plan. ▪ Will refer issues to the species management panel or other specialist groups, when asked by TAMS staff.

Agency	Role	Accountability
<p>Mulligans Flat and Gorooyarroo Research Committee</p>	<p>Coordinates research activities and facilitates liaison between researchers involved in the Mulligans Flat-Gorooyarroo Woodlands Experiment. Members include representatives from the ANU, ACT Government and CSIRO.</p>	<ul style="list-style-type: none"> Contribute towards the planning and delivery of research projects on the MNES protected within the Offset Areas.
<p>Land Development Agency</p>	<p>Developer of the Throsby residential area.</p>	<ul style="list-style-type: none"> Planning access into Offset Areas during and post construction Re-locate woody debris from development areas into the Offset Areas, with advice from TAMS/CPR Provide biodiversity education and awareness activities for Throsby residents as part of the Mingle program, in conjunction with the Mulligans Flat TAMS.



APPENDIX 2

MANAGEMENT COMMITMENTS AS DESCRIBED IN THE GSA BIODIVERSITY PLAN AND HABITAT IMPROVEMENT PLANS RELEVANT TO THE EXTENDED SANCTUARY

OFFSET PLANNING

Activity	Description
Reserve Operations Plan	<ul style="list-style-type: none"> An annual reserve operations plan will be developed by operational staff. This plan will set clear priorities for the management of the conservation values within the Offset Areas and provide detail on how the actions outlined within this Offset Management Plan will be delivered. These plans will be developed following the Urban Reserves Operation Planning System (TAMS, unpublished).
Biomass Management Plan (for ecological purposes)	<p>A Biomass Management Plan will:</p> <ul style="list-style-type: none"> guide the management of the understorey biomass within the Offset Areas. assess each of the biomass management options (i.e. grazing, slashing and burning) describe the biomass management infrastructure and resource requirements.
Cultural Heritage Assessment Reporting and Management requirements	<ul style="list-style-type: none"> Engage the traditional land custodians to undertake aboriginal heritage survey within the Offset Areas Follow the guidelines outlined in the <i>Cultural Heritage Reporting Policy</i> (ACT Government 2015b). This document details the cultural assessment and reporting requirements for projects that may impact on places or objects with indigenous or historic heritage value. Report the discovery of an Aboriginal place or object to the Heritage Council within five working days. Engage a suitably qualified expert to undertake a heritage assessment for the Inglewood Homestead and prepare management guidelines to conserve the site's cultural heritage values.
Bushfire Hazard Management Strategy	<ul style="list-style-type: none"> A bushfire management plan will satisfy both the bushfire fuel management and ecological requirements, with a focus on the specific biomass management requirements of each MNES.

CAPITAL IMPROVEMENTS WORKS

Activity	Description
Predator Proof Fence	<ul style="list-style-type: none"> ▪ Preliminary planning and installation of a predator proof fence to extend the Mulligans Flat Woodlands Sanctuary.
Stock Proof Fencing	<ul style="list-style-type: none"> ▪ The installation of stock proof fencing will be guided by the Biomass Management Plan, the Recreation Plan and specific ecological management requirements.
Stock Water	<ul style="list-style-type: none"> ▪ Upgrade existing or install new stock water infrastructure as guided by the biomass management plan.
Stockyards	<ul style="list-style-type: none"> ▪ Funding to upgrade portable stockyards if required
Tracks and Trails	<ul style="list-style-type: none"> ▪ Expand the existing network of recreation and management tracks and trails as guided by the Recreation Plan Biomass Management Plan and Bushfire Management Strategy
Kenny Broadacre Car Park Upgrade	<ul style="list-style-type: none"> ▪ Upgrade Kenny Broadacre car park ▪ Seek advice and approvals from ACT Roads on design ▪ Seek advice on the planning requirements for this project. An EIS and/or a development application (and CEMP) may be required.
General Park Signage	<ul style="list-style-type: none"> ▪ Design, construct and install reserve signage to identify the reserve to the public including prohibited activities. ▪ Signs will be installed at all entrance points into the Offset Areas.

ENVIRONMENTAL RESTORATION

Activity	Description
Revegetation and Protection of Natural Regeneration	<ul style="list-style-type: none"> ▪ Natural regeneration of indigenous trees and shrubs will be promoted within the Box Gum Woodland areas. ▪ Any revegetation of canopy or shrub species within the Box Gum Woodland will be dependent on the extent and diversity of naturally regenerating plants within the Offset Areas. ▪ The management of regenerating trees and shrubs and the location of revegetation works will be guided by the regional linkage model ▪ Revegetation of understorey species will be guided by the results of the vegetation monitoring program and any requirements to increase the diversity and cover of native forbs and grasses to increase the quality of Box Gum Woodland and derived grassland areas. ▪ Revegetate dam edges to create frog friendly habitat. ▪ Planting will also occur along Sullivan's Creek to assist control active gully erosion. ▪ All revegetation projects will be subject to a monitoring and maintenance program.
Gully Erosion	<ul style="list-style-type: none"> ▪ An erosion control plan will address the gully erosion along Sullivan's Creek. ▪ Implement the plan, which will include a monitoring and maintenance program.
Sheet Erosion	<ul style="list-style-type: none"> ▪ Use native grass species to revegetate areas of sheet erosion within Throsby East
Placement of Woody Debris	
Eucalyptus Dieback	Undertake measures specifically for the purpose of addressing eucalyptus dieback within the Offset Areas (e.g. soil coring to reduce soil compaction)
Ecological Burning	The implementation of an ecological burning program will be guided by the Biomass Management Plan and following advice from CPR.

ON-GOING OPERATIONAL WORKS

Activity	Description
Control Invasive Plants	<ul style="list-style-type: none"> ▪ Expand the weed control program operating within the Mulligans Flat and Goorooyarroo Nature Reserves to include the Offset Areas. ▪ Target weeds that are of high priority for control, namely: <ul style="list-style-type: none"> – Serrated Tussock – Patterson’s Curse – St John’s Wort – Sweet Briar (esp in ploughed area in Throsby head) – Saffron Thistles
Control Invasive Animals (including ruderal species)	<ul style="list-style-type: none"> ▪ Expand the invasive animal control program operating within the Mulligans Flat and Goorooyarroo Nature Reserves to include the Offset Areas. ▪ The program will target foxes, rabbits and hares to reduce the impact from these species on native species populations and habitat. ▪ Extra costs will be associated with invasive animal control (in particular rabbit control) with the expansion of the Mulligans Flat Woodlands Sanctuary. ▪ Ruderal species also need to be controlled within the Offset Areas. Specifically, this includes: <ul style="list-style-type: none"> – Common Myna (<i>Acridotheres tristis</i>) – Noisy Miner (<i>Manorina melanocephala</i>) – European Wasp (<i>Vespula germanica</i>) – Stray and feral cats
Manage Overabundant Animals	<ul style="list-style-type: none"> ▪ Kangaroos will be managed in accordance with the Kangaroo Management Plan (ACT Government 2010).
Manage Pathogens	<ul style="list-style-type: none"> ▪ Develop an information hand-out for key staff, contractors and volunteers on the risks from <i>Phytophthora cinnamomi</i> and associated management protocols for working within the Offset Area. ▪ These management procedures will be revised immediately if a <i>P. cinnamomi</i> infestation is identified in the vicinity of or within the Offset Area.
Manage Heritage Sites	<ul style="list-style-type: none"> ▪ Manage the cultural heritage values within the Offset Areas according to the relevant management plans and guidelines as is required under the <i>Heritage Act 2004</i>.

COMMUNITY ENGAGEMENT

Activity	Description
ParkCare – Friends of Mulligans Flat Woodlands Sanctuary	Continue to support and engage the Friends of Mulligans Flat and other community groups in the management of the conservation values within the Offset Areas and adjoining reserves.
Citizen science	Engage the community in establishing programs for European Wasp and Indian Myna control. These programs will seek to educate and involve local residents in both monitoring (European Wasp and Indian Myna) and control activities (Indian Myna only).

APPENDIX 3

LINKS WITH REGIONAL AND NATIONAL STRATEGIES AND RECOVERY PLANS

Strategic Objective	Title
<p>The management and recovery of threatened species and ecological communities (including long-term research and monitoring projects)</p>	<p><u>ACT Nature Conservation Strategy 2103 – 23</u> (ACT Government 2013a)</p> <p>Box Gum Woodland</p> <p><u>The National Recovery Plan for White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland</u> (Department of Environment, Climate Change and Water NSW 2010)</p> <p><u>Action Plan No. 27 – ACT Lowland Woodland Conservation Strategy</u> (ACT Government 2004).</p> <p>Manning, A. D., Wood, J. T., Cunningham, R. B., McIntyre, S., Shorthouse, D. J., Gordon, I. J. and Lindenmayer, D. B. (2011) <u>Integrating research and restoration: the establishment of a long-term woodland experiment in south-eastern Australia</u>. <i>Australian Zoologist</i> 35(3): 633–648.</p> <p>Golden Sun Moth</p> <p><u>Action Plan No. 28 – ACT Lowland Native Grassland Conservation Strategy</u> (ACT Government 2005).</p> <p>Superb Parrot</p> <p><u>National Recovery Plan for the Superb Parrot <i>Polytelis swainsonii</i></u> (Baker-Gabb 2011)</p> <p><u>Action Plan No. 27 – ACT Lowland Woodland Conservation Strategy</u> (ACT Government 2004).</p> <p>Striped Legless Lizard</p> <p><u>National Recovery Plan for the Striped Legless Lizard (<i>Delma impar</i>): 1999–2003</u> [Smith, W. J. S. & P. Robertson, 1999] [Recovery Plan].</p> <p><u>Action Plan No. 28 – ACT Lowland Native Grassland Conservation Strategy</u> (ACT Government 2005).</p> <p>Woodland Birds</p> <p><u>Action Plan No. 27 -ACT Lowland Woodland Conservation Strategy</u> (ACT Government 2004).</p>
<p>The assessment and management of places or objects with heritage value</p>	<p>ACT Heritage Council <u>Cultural Heritage Reporting Policy</u> (ACT Government 2015b)</p>

Strategic Objective	Title
Addressing land management issues	<p>Invasive Plants</p> <p><i>ACT Weeds Strategy 2009 – 2019</i> (ACT Government 2009).</p> <p><i>Noxious and Environment Weeds Operations Plan (eWOP)</i> – ACT Parks and Conservation Service (updated annually)</p> <p>Invasive Animals</p> <p><i>Canberra Indian Myna Action Group Strategy</i> (Canberra Indian Myna Action Group 2006)</p> <p><i>ACT Pest Animal Management Strategy 2012–2022</i> (ACT Government 2012)</p> <p><i>Vertebrate Pest Management Operations Plan</i> – ACT Parks and Conservation Service (updated annually)</p> <p>Over-abundant Animals</p> <p><i>ACT Kangaroo Management Plan</i> (ACT Government 2010)</p> <p>Bushfire Management</p> <p><i>The ACT Strategic Bushfire Management Plan 2014–2019</i> (ACT Government 2014)</p>



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