Close to the Edge

An Investigation into the effects of urban expansion on the environment of the ACT

OFFICE OF THE COMMISSIONER
FOR SUSTAINABILITY AND
THE ENVIRONMENT

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This document is available online at www.envcomm.act.gov.au

For further information, contact:

Commissioner for Sustainability and the Environment
GPO Box 158
Canberra ACT 2601

Telephone 02 6207 2626
Email envcomm@act.gov.au
Website www.envcomm.act.gov.au

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Close to the Edge

An investigation into the effects of urban expansion on the environment of the ACT

OFFICE OF THE COMMISSIONER
FOR SUSTAINABILITY AND
THE ENVIRONMENT

Acknowledgement of Country

The Office of the Commissioner for Sustainability and the Environment acknowledges the Ngunnawal people as traditional custodians of the ACT and recognises any other people or families with connection to the lands of the ACT and region. We acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region.

We recognise the relationship and connection that Ngunnawal people have with this Country. The Ngunnawal are a thriving people whose life and culture is connected unequivocally to this land in a way that only they understand and know, and is core to their physical and spiritual wellbeing.

We recognise the significant contribution the Ngunnawal people make in caring for Country as for time immemorial they have maintained and will continue to maintain a tangible and intangible cultural, social, environmental, spiritual and economic connection to these lands and waters.

Foreword

Canberra's natural environment holds immense value locally, nationally and internationally. It is exceptionally beautiful and deeply treasured by Canberrans.

Over the disrupted and challenging years of COVID-19 lockdowns, the connection of Canberrans to nature was clear through our visits to Canberra Nature Park reserves:[1]

> *"The Pinnacle nature reserve was a lifesaver as I navigated each day in lockdown with my two year old son and newborn baby. We went for a walk whatever the weather and always felt better emotionally for doing so. I feel so lucky to live in a place that has such beautiful, open spaces."*

> *"Having access to the reserve was incredibly positive for my wellbeing during lockdowns, and continues to be so now."*

> *"Thank goodness we have them!"*

While the intrinsic and extrinsic value of our natural environment is apparent, the environment is in a relentless state of decline and increasing pressure. Our priceless native species and ecological communities are not sufficiently protected to be resilient to future threats from climate change and urbanisation.

The 2023 ACT State of the Environment Report[2] outlined the required reforms to redress these declines. However, the Government response largely rejected this agenda and instead accepted the outlined environmental destruction as a "sad and unfortunate reality".[3]

This current Investigation comprehensively assesses the impact of urban development on the natural environment of the Territory over recent decades. It outlines the tremendous impact of urban expansion and ill-considered densification on nature. Current legislative and policy settings are not sufficient to protect our natural environment and have categorically failed to deliver a compact and efficient Canberra despite rhetoric.

The current state of our environment is the predictable outcome of ineffective legislation and policy. Maintaining the same approach and rejecting reform is – without doubt – tacit acceptance of and contribution to the biodiversity crisis.

Remedying this unconscionable state of our biodiversity will not be easy. It will require restoration to redress past environmental losses, improve the condition of communities and reverse this trend of decline. It will require sustained commitment to prioritising our environment, and this will, of course, have policy and resource implications.

Dr Sophie Lewis
ACT Commissioner for Sustainability and the Environment

1 Office of the Commissioner for Sustainability and the Environment, 2024. *Returning to Our Roots: How the pandemic helped reshape our relationship with nature*. Available at: https://storymaps.arcgis.com/stories/32d7df5c31884eeeaecd67abfbcb2fb5
2 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*.
3 The Legislative Assembly for the Australian Capital Territory, 2024. *ACT State of the Environment Report 2023 Government Response*.

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- Mr Rainer Rehwinkel
- ACT Rural Landholders' Association of Farmers
- Matthew, Jenny and Peter Ipkendanz
- Mr Michael Blake
- Mr John Evans

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Introduction

Development in Whitlam. Source: Richie Southerton

1. Introduction

1.1 Status of this report

This report pertains to the Commissioner's functions under Section 12.1 (c) of the *Commissioner for Sustainability and the Environment Act 1993* (the Act), under which the Commissioner has the following function:

> (c) conducting, on the Commissioner's own initiative, investigations into actions of an agency where those actions would have a substantial impact on the environment of the ACT.[1]

As such, this is a Special Report as described in Section 21 of the Act. It must be presented to the Legislative Assembly by the Minister within six sitting days after the day of receipt.

1.2 Why is urban planning being investigated?

Across all spatial scales, our natural environments are under tremendous and increasing anthropogenic pressures.

The connection between environmental deterioration and the expansion of urban environments has been comprehensively established. In 2021, the Australian State of the Environment Report presented a picture of environmental deterioration evident through our national biodiversity loss crises.[2] It found the number of listed threatened species had risen eight per cent since 2016, with more extinctions expected in the next decades. At least 19 Australian ecosystems are now showing signs of collapse or near collapse.

The 2021 report outlined that urban expansion across Australia has had significant and increasing environmental impacts. Habitat loss and degradation is the dominant mechanism by which species are threatened in Australia, and urbanisation is a key factor driving this loss.[3] Land clearance is also listed as a key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).[4,5]

> *Land clearing consists of the destruction of the above ground biomass of native vegetation and its substantial replacement by non-local species or by human artefacts… Land clearing includes clearance of native vegetation for crops, improved, pasture, plantations, gardens, houses, mines, buildings and roads.*

Here in the ACT, urban expansion has long been recognised as a key threat to areas of high conservation value. The 1997 ACT State of the Environment Report identified that woodlands, grasslands and the species that depend on them have suffered most from urban development. Further, it found that urban development constitutes a serious threat to their existence, regardless of how slow the urban spread might be.[6] Two decades later, the 2019 ACT State of the Environment Report noted that the region's population has

1 ACT Government, 2024. *Commissioner for Sustainability and the Environment Act 1993 (ACT), Republication No 19.*
2 Australian Government, 2021. *Australia State of the Environment Report 2021.*
3 ibid.
4 Australian Government, 2024. *Environment Protection and Biodiversity Conservation Act 1999, Republication No 39.*
5 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2021. Land clearance. Available at: https://www.dcceew.gov.au/environment/biodiversity/threatened/key-threatening-processes/land-clearance.
6 Office of the Commissioner for Sustainability and the Environment, 1997. *1997 ACT State of the Environment Report.*

Whitlam under construction. Source: EPSDD

been growing and the city's footprint has expanded.[7] While over 70 per cent of the ACT is protected areas, this report showed that the urban–natural environment interface, in particular, requires careful and concerted management.

Meanwhile, Canberra's urban footprint continues to grow. Between 1991 and 2016, the ACT's urban land area grew by 57 per cent.[8] Between 2006 and 2022, it expanded a further nine per cent, and mounting environmental issues associated with this continued urban growth were again highlighted in the 2023 ACT State of the Environment Report, which included a dedicated chapter on Canberra's urban boundary.[9]

The severity of urban expansion impacts on the ACT's environment to date was not inevitable. Canberra is a planned city and these impacts are the result of strategic planning decisions that continue to be made and continue to ensure the natural environment is threatened by land clearance activities. This expansion and environmental decline occurred after the 2004 Canberra Plan[10] envisaged growth within a contained urban structure.

In order to remediate these impacts, future expansion of Canberra requires a substantially different approach to urban planning. This report assesses both the current legislative settings and the impacts of urban expansion on native environments in the ACT to date. In doing so, it aims to guide a more nature-focussed approach to urban planning in Canberra.

7 Office of the Commissioner for Sustainability and the Environment, 2019. *2019 ACT State of the Environment Report.*
8 Office of the Commissioner for Sustainability and the Environment, 2019. *2019 ACT State of the Environment Report*, Land Use Change. Available at: https://actsoe.com.au/report/land/indicator-l1-land-use-change
9 ibid.
10 ACT Government, 2004. *The Canberra Plan.*

1.3 What this report does and does not do

This report examines the intersection of land use, planning and biodiversity loss in the ACT. The report provides a robust assessment of the cumulative loss of nature in the ACT and explores the driving factors behind this trend in environmental decline. There are two approaches that this report combines to establish the impact of planning on nature loss:

1. *Quantitative analysis of several measures of change.*
   This includes assessments of:
   i. land use change in the ACT over time
   ii. changes in native species populations over time, and
   iii. changes in the condition of native ecosystems over time.

   This analysis aims to determine the extent of biodiversity loss and identify changes caused by factors within our control (i.e. regulatory enforcement and legislative settings) rather than broad exogenous factors (such as climate change).
2. *Review of policy and legislative settings.*
   This includes examination of the function of ACT nature reserves and other protected areas, including the efficacy of environmental offsets.

The focus is on the time period underpinned by robust data and satellite imagery available, which is around 2004 to present. It includes a detailed review of specific locations to examine the interplay between development and environmental protection in the ACT. It does not explore long term changes or changes extending beyond the ACT's jurisdictional border. The report examines the environmental impacts of land use planning and does not focus on social or economic considerations or drivers of development.

1.4 Further relevant context

The report was also written during the period in which significant Machinery of Government changes were being discussed and undertaken in the ACT. At the time of finalising this report, the formation of two new Directorates was proposed, which included the coalescence of Transport Canberra and City Services, the Environment, Planning and Sustainable Development Directorate, Access Canberra and some related regulatory functions. While the specific entities and units discussed in this report may not exist in the same form following implementation of the changes, it is expected that the findings will be relevant to the derivative business unit/s.

Section 15(7)(a) of the *Commissioner for Sustainability and the Environment Act* requires both the principal officer of an agency and any officer concerned in an investigation have "opportunities to appear before the commissioner … and to make any submission, either orally or in writing" if the report is likely to set out opinions that are, either expressly or impliedly, critical of an agency or person. The explanatory statement for the Act explains the relevant clause as that the principal officer or relevant person "must be given a chance to make a submission to the commissioner … before the report is completed".

In drafting this report, opportunity was provided to the Environment, Planning and Sustainable Development Directorate to provide feedback on content. Feedback on the majority of the report was not provided within agreed timeframes.

2

Summary and Recommendations

Medium density housing. Source: EPSDD

2. Summary and Recommendations

2.1 What has this Investigation learned?

This Investigation analyses trends and condition in native vegetation and species, reviews generations of planning and conservation policy and legislation, and examines numerous examples of development of various scales that have already taken place or are in the process of occurring. This information is detailed in Chapters 4-7 and summarised here focussing on the period from 2004 to 2023.

Collectively, this information confirms the decline in the extent and condition of biodiversity in the ACT over decades. Over this period of decline, successive investigations and reports conducted by this Office and by other agencies illuminate that this decline is an outcome that can and has been expected as a result of decisions made in planning Canberra's urban environment. Legislation, policies, plans and strategies for planning, conservation and biodiversity, and their implementation in the ACT over this period have not been sufficient to protect biodiversity from further degradation from urbanisation.

Existing conservation reserves (i.e. national parks and protected areas) provide some protection from the ecological impacts of urban expansions. However, this approach is also not sufficient to protect biodiversity. Assessments of ecosystems in reserves under the Conservation Effectiveness Management Program (CEMP) reveal mixed results including many in poor condition. In addition, threatened species and areas of high conservation value are often located outside the reserve system. This means that in some cases ecosystems and species of national and global values have insufficient protections.

Goorooyaroo Nature Reserve. Source: Mark Jekabsons

Box-Gum Grassy Woodland. Source: Ryan Colley

Box-Gum Grassy Woodland ecosystems, once widespread, have been heavily cleared and fragmented, with over 95 per cent of their original area lost nationally. This has left small, isolated patches vulnerable to further degradation from urban and agricultural pressures. The ACT contains the largest remnants of this ecosystem in Australia which are still in good condition, with 77 per cent of the remaining grassy woodland within the reserve network and 23 per cent outside it. Within the ACT, 66 per cent of the original cover has been lost, leaving 10,865 ha remaining out of an original 32,000 ha. Continued small losses of grasslands and woodlands can be described as a "death by a thousand cuts" to these ecosystem types.

Canberra's natural environment sits, more than ever, in a place of great precarity, under stress from the broad trends of climate change, national and global biodiversity loss, and urban encroachment. At stake in our approach to urban development is Canberra's reputation and aesthetic as the "Bush Capital".

2.2 What are the problems this report has found?

1. Development of Canberra has had, and is *continuing* to have, a significant and detrimental impact on native species. From 2004 to 2023:
    - The ACT's building footprint grew by 40 per cent, largely due to greenfield developments. The extent of Box-Gum Grassy Woodland and Natural Temperate Grassland declined. These are threatened ecological communities.
    - Urban development affected 30 of the ACT's 66 threatened species, including birds, mammals, reptiles, fish and insects.
    - Urban developments led to localised vegetation loss, especially in Gungahlin, Molonglo Valley and Jerrabomberra, where vegetation cover declined by more than 20 per cent in some areas.
    - A larger proportion of the ACT's two Matters of National Environmental Significance communities are now located within close proximity to the city's urban edge, making them vulnerable to a range of "edge effects".

2. Where development has already occurred, in spite of a raft of policy measures, there is insufficient consideration in practice of opportunities for nature to thrive in the urban environment.
    - The environment lacks primacy in legislation and is rarely prioritised in implementation of government policy.
    - Mature trees are legally recognised as critical ecological features but are not sufficiently protected, retained or recruited.
    - Urban green infrastructure (such as native plantings and rain gardens) is inconsistently implemented.
    - Conservation is focused on reactive measures such as offsets while proactive retention and recruitment of vegetation is underutilised or in some cases actively undermined.
    - Future urban expansion of Canberra will impact ACT species and ecosystems, including through habitat loss, fragmentation and connectivity impacts.
    - As has already occurred, the likely future impacts of urban development will interact with and augment pressures from broader trends, such as climate change and habitat degradation.
    - These broader, exogenous pressures are significant factors in poor environmental condition in the ACT and can only be alleviated by addressing endogenous pressures that are within our jurisdictional control.
    - Planned developments currently under construction in the northern and western ACT further threaten ecological communities and species.

At the crux of the problems identified in this Investigation and summarised above are two core issues.

First, biodiversity is not sufficiently prioritised in legislation and policy making. Healthy biodiversity is essential to the natural world and fundamental to human life. The complex and dynamic interactions between plants, animals, microorganisms and soil, water and air underpin the health of ecosystems. Whilst biodiversity is dependent on good ecosystem health, biodiversity itself plays a pivotal role in maintaining ecosystems. The most relevant legislation – the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – is in effect legislation for development approvals, rather than legislation for environmental protection.

Second, government spending on the environment at all jurisdictional levels is meagre and demonstrably inadequate. In the 2023–24 and 2024–25 ACT budgets, only three per cent of total spending was allocated to the environment, sustainable development and climate change combined. This is the lowest proportion of budget allocation to any of the 11 identified areas apart from one, and the proportion of this funding that goes to biodiversity conservation is only a fraction of one per cent of the total ACT budget. It is therefore hard to take the view that biodiversity protection is a genuine priority for the ACT. Additional allocations of funding in the ACT Government budget are required for better environmental outcomes.

2.3 What are some of the solutions to these problems?

Based on the suite of information considered in this report, the following points must be considered to address the current state of the Territory's natural environment:

1. Plan strategically for the future development of Canberra so that any development occurs where the impact on native species and communities is as minimal as possible, and impacts are avoided rather than offset. Current legislation and planning is not accomplishing this.
2. Where development does occur, plan how houses and streets are built so that biodiversity is more significantly considered in our city.
3. Where the environment has already been impacted by development in Canberra, identify opportunities to restore nature and improve its resilience to other large-scale pressures.
4. Better recognise the intrinsic value of Canberra's natural environment and that once it is lost or degraded, it cannot be recovered in many instances.

2.4 What are some ways for Government to work on these solutions?

The following is a list of specific Recommendations that are made to Government to begin addressing and redressing the significant impacts on Canberra's natural environment from urban development that is occurring without adequate consideration of environmental impacts.

This Office is of the view that none of these Recommendations reflect current Government policy, and any antecedent or precursory initiatives to those recommended are not sufficient to address these significant environmental impacts. Current legislation, policy and approaches have not remedied the decline in our environment, due to combinations of their insufficiencies, inadequate resourcing and lack of Government commitment to long term strategy.

In order to comprehensively address the decline of nature, Canberra's environment needs *primacy* and *funding*.

Whitlam under construction. Source: EPSDD

Recommendations

Recommendation 1.

In order to identify areas of environmental conservation value of undeveloped land within the existing urban footprint and potential future development areas, undertake the following:

i. Consolidate existing strategic mapping and assessments of the ACT.

ii. Identify gaps and undertake mapping and assessments of these missing areas.

iii. Publish strategic mapping and assessments of the ACT.

Recommendation 2.

Based on the outputs of Recommendation 1, develop and implement a transparent process to identify key values for all open space within Canberra, as well as potential future development areas, to ensure future development does not impact environmental values. This would clearly articulate and rank values (including environmental values) and would enable the prioritisation of development on sites where environmental impacts would be lower.

Recommendation 3.

Develop and implement a method for the consideration of cumulative and incremental environmental impacts – an ecosystem approach – under the *Planning Act 2023* (s 10 and 104).

Recommendation 4.

Develop and implement a comprehensive agricultural policy for the ACT that gives consideration to:

i. Better supporting farmers to undertake conservation and biodiversity practices outside the reserve system, including an ecosystem approach.

ii. Resolving lease uncertainty issues so that rural leaseholders have greater opportunity to plan and undertake economic and conservation activities.

iii. Improving communication and collaboration across tenures to support an ecosystem approach to pests and weeds, and landscape-scale habitat connectivity.

Recommendation 5.

Fulfil the statutory requirement to review the 2018 Planning Strategy and update to:

i. Set an urban growth boundary.

ii. Define 'infill' and 'greenfield' with regard to the current urban boundary.

iii. Replace "up to" in setting targets for 70 per cent infill with "at least".

Recommendation 6.

Refuse development applications that negatively impact threatened ecological communities. The development application assessment process should explicitly seek to avoid indirect impacts from edge effects and urban encroachment as well as outright destruction of threatened communities.

Large suburban eucalypt. Source: ACT Government

Recommendation 7.

Finalise and implement the ACT Offsets policy, including the following:

i. Stipulating that offsets are a last resort, and that avoidance and mitigation are the default approach.

ii. Where the use of offsets is unavoidable, requiring that any offsets have clear monitoring and reporting guidelines within the ACT Offsets policy.

Recommendation 8.

Establish and resource an internal auditor function in the Territory Planning Authority in order to:

i. Assure compliance with development applications and EPBC Act approvals.

ii. Undertake random audits of compliance with environmental laws and conditions during construction.

iii. Apply stronger penalties for proponents and contractors who do not adhere to environmental approval requirements.

Recommendation 9.

Require that environmental assessments to support development applications must be conducted by suitably qualified ecological consultants contracted by and accountable to the Conservator for Flora and Fauna, not the developer.

Recommendation 10.

Implement standardised assessment criteria of Environmental Impact Statements and of Environmental Significance Opinions, rather than using Guides, to ensure that:

i. All applicants provide consistent information about environmental impacts.

ii. ACT Government assessments apply consistent assessment criteria in evaluating information provided by applicants.

This would address identified inconsistencies in the level of detail and type of information provided currently in EIS and ESO applications described in Section 4.4.2.

Recommendation 11.

Strengthen legislative requirements to retain mature native trees in developments, including trees which have been planted.

Recommendation 12.

Implement bans on further installation of artificial turf in all suburbs and set a date for mandatory removal of all currently used residential artificial turf. The ban should be absolute for residential settings, and by exemption following application and approval for commercial and community settings.

Recommendation 13.

Increase the level of funding support to facilitate the implementation and maintenance of high-quality living infrastructure.

Recommendation 14.

Provide definitions of the following terms in the *Planning Act 2023*:

i. Land Management Agreement.

ii. significant adverse environmental impact (to include both qualitative and quantitative aspects of the impacts).

Recommendation 15.

Include Stromlo Block 402 in the gazettal of Stromlo Block 403 and Denman Prospect Block 12 as nature reserve.

3

Key background information for this report

Black Mountain looking north and east. Source: EPSDD

3. Key background information for this report

3.1 Canberra is Ngunnawal Country

The Ngunnawal people are the ACT region's first inhabitants, having lived here and cared for this Country for more than 25,000 years. Ngunnawal knowledge of Country and management practices have influenced the natural environment of the Canberra region for many thousands of years.

Colonisation of Ngunnawal Country has led to significant, long-term changes to its land and waters, with detrimental impacts on plants, animals and people. This is demonstrated in the decline of ecosystems and species over time that has been reported in decades of environmental reporting, as well as in descriptions and knowledge of the region in pre-colonial times.

For example, it has been estimated that less than 0.2 per cent of the pre-settlement range of Natural Temperate Grassland is formally protected in reserves in south-eastern Australia.[1] While precise figures are hard to determine, less than 10 per cent of Natural Temperate Grassland survives today compared with pre-settlement times.[2] Several of these changes in environmental state and condition have been reported in the ACT Government's Caring for Dhawura Ngunnawal – A natural resource plan for the ACT.[3] The following points have been taken from that plan.

Sunset over the Brindabellas from the Pinnacle Nature Reserve. Source: Richie Southerton

1 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, Canberra's Urban Boundary. Available at: https://www.actsoe2023.com.au/issues/canberras-urban-boundary/

2 ibid.

3 ACT Government, 2022. *Caring for Dhawura Ngunnawal: A natural resource plan for the ACT 2022–2042.*

Painting of Ginninderry New South Wales by Robert Hoddle, 1832. Source: The National Library of Australia

- Since European settlement our native grasslands have come under increasing pressure from agricultural modification, urbanisation, weeds and changing climate.
- Aquatic habitats have been highly modified since European settlement through the clearing of riparian vegetation, changes to hydrology, increased sedimentation, reduced water quality and introduction of pest fish species.[4] The natural flows of most river reaches in the ACT have been altered by dams and weirs that change flow regimes and impact fish spawning movements. Water quality in the Murrumbidgee and Molonglo rivers has been adversely affected by upstream agricultural activities and urban run-off. Instream habitat (e.g. woody debris, rocky habitat) has been vastly reduced due to historical clearing of riparian areas and sedimentation.[5]
- Macropods play a central role in grassy ecosystems. Under pre-European conditions (e.g. likely natural predation by the Dingo and hunting by Aboriginal peoples), the woodland ecosystems were finely adapted to the shifting broad-scale grazing patterns and essential biomass control functions that the large macropods and their smaller relatives performed. Their densities across the ACT have increased considerably since the 1960s and they now exert high grazing pressure across some of the lowland reserves. This impacts the flora, fauna and soil composition at these sites. Livestock grazing, which can also exert pressure on woodlands, poses a range of unique threats to woodland systems.
- Pest animals, including European rabbits, European red foxes, feral cats, feral pigs, feral horses, Indian mynas, European wasps, European honeybees and several species of deer, can impact native species associated with woodland communities in the ACT.

4 ACT Government, 2018. *ACT Aquatic and Riparian Conservation: Strategy and Action Plans.*
5 ibid.

The following statement from the Dhawura Ngunnawal Caring for Country Committee explains the connection between Ngunnawal people and Country.

Dhawura Ngunnawal – Ngunnawal Country

For time immemorial Ngunnawal people have maintained a tangible and intangible cultural, social, environmental, spiritual, and economic connection to these lands and waters. This connection is underpinned by the lore and cultural authority of Country.

Ngunnawal Elders and leaders hold the cultural authority to speak for and be decision makers for the lands and waters that is Ngunnawal Country. Cultural authority is held by the Ngunnawal as traditional custodians of all the lands and waters of Ngura – their home. This is informed through deep listening to and understanding of Country and the ancestors knowledges passed on throughout time. The generational sharing of ancient lore and systems has been nurtured by knowledges over tens of thousands of years through deep listening to understand, lifelong learning, undertaking cultural practices and commitment to Country.

Canberra is not just a place where we co-exist, live, work, raise families, play and come together as a community – it was, is and always will be Ngura (home) to the Ngunnawal people. Dhawuramulan Ngunnawal is our way of being; our dreaming; the spirit, the soul, the heart, the foundation and the strength of our people. Dhawura gives Ngunnawal our identity, our apical lineage, our cultural authority, our songlines, our lore, ceremony and practices. It nurtures our people and gives us our past, our tomorrow and our future.

Ngunnawal Country is the foundation and salient ingredient on which the ACT is built. Respecting and valuing the Ngunnawal ways of being on and doing for Country as is our right as the first peoples and land managers of the lands and waters of the ACT and region.

The journey of shaping the urban landscape to meet the needs of a growing population, managing the impacts of climate change, the conservation and protection of the environment, the cultural landscape and heritage must begin with the foundation and cultural authority of Ngunnawal in caring for Ngunnawal Country. For in caring for Country and all it encompasses, Country will provide and care for us and our future generations.

3.2 Years of reviews not reform

The threats to Australia's natural environment and progressive decline in the state of our environment has been illuminated in multiple reports over recent decades. These reports highlight both the degradation of the environment through varying measures, and the firmly entrenched failures of legislation to protect the environment at multiple jurisdictional levels.

This legislative setting is explored in depth in Chapter 4, with summary information provided here for context.

Commonwealth snapshot

The 2021 Australian State of the Environment Report presented a picture of environmental deterioration evident through our national biodiversity loss crises,[6] with at least 19 ecosystems showing signs of collapse or near collapse and an eight per cent increase in the number of listed threatened species since 2016. Habitat loss and degradation is the dominant mechanism by which species are threatened in Australia, and urbanisation is one key factor driving this loss.[7]

The 2019 independent statutory review (the Samuel Review) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)[8] identified that current federal environment laws provide insufficient protections, and that the environment has suffered from failures to improve the law and its implementation.[9] The Samuel Review determined that the EPBC Act has failed to achieve its objectives and requires reform to assess and address cumulative environmental impacts.

> *Australia's natural environment and iconic places are in an overall state of decline and are under increasing threat. The environment is not sufficiently resilient to withstand current, emerging or future threats, including climate change. The environmental trajectory is currently unsustainable. The EPBC Act does not clearly outline its intended outcomes, and the environment has suffered from two decades of failing to continuously improve the law and its implementation.*[10]

Construction in Victoria. Source: Troy Mortier

6 Australian Government, 2021. *Australia State of the Environment Report.*
7 ibid.
8 Australian Government, 2024. *Environment Protection and Biodiversity Conservation Act 1999, Republication No 39.*
9 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report*. Prepared for the Department of Agriculture, Water and the Environment.
10 ibid.

New South Wales snapshot

The 2021 NSW State of the Environment Report parallels the federal predicament.[11] The growing population of NSW continues to exert pressure on the environment, and the number of species listed as threatened in NSW continues to rise. These species are at the greatest risk from multiple anthropogenic threats including vegetation clearing, the increasing impacts of climate change and the interrelated spread of invasive species.

The recent statutory review of adjacent NSW legislation, the *Biodiversity Conservation Act 2016* (NSW),[12] reveals similar systemic legislative issues.[13] The review states that the objects of the Act – to conserve and maintain biodiversity and ecosystem services – lack primacy and are being undermined by other legislation.

> *Biodiversity is not being conserved at bioregional or State scale. The diversity and quality of ecosystems is not being maintained, nor is their capacity to adapt to change and provide for the needs of future generations being enhanced. Yet these are the principal purposes of the legislation [..] The failure of the Act to achieve its principal purpose is contributing to the continuing deterioration of the environment [..] The future wellbeing of the people of NSW rests upon beginning the repair of nature.*[14]

Collectively, these reviews catalogue an intensely strained natural environment. Furthermore, they demonstrate the legislative failures and lack of government response that has led – to a large extent – to the abject environmental circumstances we now face.

Bushfire runoff and sediment in the Cotter River at Black Sallee Flat on 19 February 2020. Source: Mark Jekabsons

11 NSW Environment Protection Authority (EPA), 2021. *NSW State of the Environment 2021.*
12 NSW Government, 2024. *Biodiversity Conservation Act 2016 (NSW), Republication No 63.*
13 Henry, K. et al., 2023. *Independent Review of the Biodiversity Conservation Act 2016.*
14 ibid.

Land cleared for development. Source: Ryan Colley

Biodiversity decline in the ACT

The 2023 ACT State of the Environment Report tells the same story – one of an environment under relentless, increasing pressure.[15] The findings detail the continued, relentless degradation of our natural environment. The ACT, like the rest of Australia, has been deeply affected by the dual crises of climate change and biodiversity loss. The 2020 bushfires burnt 40 per cent of the ACT, including 80 per cent of Namadgi National Park. In 2020, 75,000 ha burnt in 2003 were re-burnt, which has resulted in severe, lasting impacts on native vegetation, biodiversity, and ecosystem health.

As at 2023, there were eight critically endangered, 21 endangered, 28 vulnerable and one regionally conservation dependent species in the ACT.[16] During the reporting period for the State of the Environment Report, six additional species were listed as threatened, three species were given a higher threat status and only one species was given a lower threat status. There are three ecological communities classed as endangered, and two key threatening processes listed in the ACT. Unnatural Fragmentation of Habitats was listed as a key threatening process in December 2019.[17] While changes in listings do not necessarily represent a local decline, it is clear that the futures of some species and communities in the ACT are threatened without management intervention.

Urban expansion has long been recognised as a threat to areas of high conservation value in the ACT.[18] Conversion of land from any natural, semi-natural or rural state into urban development typically results in adverse environmental impacts. The environmental costs of expanding Canberra's footprint are immense – including clearance of habitat, disturbance of ecological communities, increased urban edge effects, and increased sedimentation and erosion from new developments.

The first statutory review of the ACT's *Nature Conservation Act 2014*[19] is currently underway.

15 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report.*
16 ibid.
17 ibid.
18 Office of the Commissioner for Sustainability and the Environment, 1997. *1997 ACT State of the Environment Report.*
19 ACT Government, 2024. *Nature Conservation Act 2014 (ACT), Republication No 32.*

Current status of reform

In spite of numerous reviews across jurisdictions calling for reform of the substance and implementation of environmental laws, there has been little demonstrable change. For example, the Samuel Review outlined that *"Legislative reform should not be a once-in-a-decade opportunity, but rather part of a sensible process of continuous improvement"*, and that *"changes should be made immediately to deliver the best possible outcomes from dated law"*.[20]

The Samuel Review contained 38 recommendations that were to be implemented over two years. The Commonwealth Government response, *The Nature Positive Plan: better for the environment, better for business*, was released in December 2022.[21] At the time of writing this Investigation, some two years since this response and four years after the Samuel Review was dated, little reform has occurred and the Commonwealth Government has largely abandoned its nature-positive approach following pushback from vested-interest commercial entities.

The Samuel Review stated that *"Reversing the unsustainable environmental trajectory will require good planning to manage the environment"*.[22] In the ACT, the configuration of the executive branch of Government has remained largely unchanged for over two decades, during which time further biodiversity decline and urban encroachment has occurred in Canberra's natural environment.

This Investigation provides a comprehensive assessment of the impact these decades of planning legislation and governance have had on the ACT's natural environment and proposes a future trajectory of necessary environmental protections.

20 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report.* Prepared for the Department of Agriculture, Water and the Environment.

21 Australian Government, Department of Climate Change, Energy and Water, 2022. *Nature Positive Plan: better for the environment, better for business.*

22 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report.* Prepared for the Department of Agriculture, Water and the Environment.

Making voices heard. Source: Flore W

3.3 A future generation's perspective

In 2024, the Office of the Commissioner for Sustainability and the Environment (OCSE) engaged high school students across Canberra about actions they want to see taken to protect nature in the ACT.[23] Postcards were sent to schools inviting students to respond to the prompt "Imagine you can make one new rule to protect nature in Canberra. What's your rule?"

Land use and planning was the third most popular theme in students' responses, appearing in 16 per cent of postcards. ACT students want to see more land protected in reserves, less development in sensitive areas, and better integration of greenspace in ACT suburbs.

23 Office of the Commissioner for Sustainability and the Environment, 2025. *"We need nature as much as we need buildings": A youth perspective on environmental protection in the ACT.*

"Reduce the amount of space housing takes up so that less nature is disturbed."
Louis, 13

"Protect the environment by developing less houses and ruining the environment."
Dallas, 12

"A min amount of older trees that have to be left in new suburbs as well as greenspaces that need to be included and a minimum amount of new trees/native plants that need to be planted."
Emily, 17

"Mandate green roofs on new buildings to boost biodiversity and manage stormwater."
Jonathan, 17

"For every new ACT suburb there should be a nature reserve placed in that suburb to stop over humanisation around Canberra."
Riley, 18

"Create more nature reserves. Extend current nature reserves."
William, 13

"I would enforce a law where a specific percentage of land bought for houses and design for architecture must be retained for greenery and kept untouched. Another law would be how undeveloped land is priced as much more expensive compared to pre-developed land; or possibly banning building on undeveloped land at all unless necessary, so builders opt to build on pre-built and pre-urbanised land."
Arnan, 12

Postcards sent by young people outlining their ideas for rules to protect nature in the ACT. Source: OCSE

4

Policy and legislative settings for planning and conservation in the ACT

Female superb parrot. Source: Ryan Colley

4. Policy and legislative settings for planning and conservation in the ACT

The Australian Capital Territory is bound by both federal and territory laws related to planning and conservation. These outline where development can and cannot be undertaken, set out regulations for conservation, and describe planning outcomes for new builds.

In this chapter, legislation relating to planning, sustainability, biodiversity and conservation is explained and detailed. Legislation is discussed foremost by its focus, rather than by jurisdictional control.

The purpose of this overview is to outline the ways in which different legislation across conservation, sustainability and planning interact. Given the complexity of this policy space, this chapter does not present an exhaustive examination of relevant legislation.

4.1 Overview of planning legislation

This section summarises and highlights key aspects of the Commonwealth and ACT planning legislation which guide development in the ACT. The two legislative approaches mirror one another, with a governing act, a spatial and policy plan, and subservient instruments and policies.

Commonwealth	Australian Capital Territory
Australian Capital Territory (Planning and Land Management) Act 1988	*Planning Act 2023*
National Capital Plan	Territory Plan and Design Guides
Statement of Planning Principles	Planning Strategy 2018 and District Strategies
Other instruments and policies	Other instruments and policies

ACT legislation must be consistent with Commonwealth legislation and operate alongside it. Commonwealth legislation ultimately has primacy if the two are in disagreement.

4.1.1 Federal considerations

Prior to self-government from 1988, land in the ACT was managed by the Commonwealth, and there is still a level of control by the Commonwealth in recognition of the ACT as the National Capital. The *Australian Capital Territory (Planning and Land Management) Act 1988 (Cth)* specifies that the Commonwealth is responsible for National Land and the ACT is responsible for Territory Land.[1] The *National Capital Plan (December 1990)* which sits under this legislation is "the strategic plan for Canberra and the Territory",[2] and is "the strategy and blueprint giving effect to the Commonwealth's interests and intentions

1 Australian Government, Department of Finance, 2021. *National Land – Australian Capital Territory*. Available at: https://www.finance.gov.au/publications/strategy/national-land-australian-capital-territory

2 Australian Government, National Capital Authority, n.d. *National Capital Plan.* Available at: https://www.nca.gov.au/planning/plans-policies-and-guidelines/national-capital-plan

Commonwealth Park is designated as National Capital land, managed by the National Capital Authority.
Source: OCSE

for planning, designing and developing Canberra and the Territory".[3] It is administered by the National Capital Authority, a Commonwealth Government statutory authority, on behalf of the Minister for Regional Development, Local Government and Territories.[4] Separately, the Minister for Finance is responsible for the management of National Land outside of the purposes of Canberra as the National Capital.[5]

The key function of this legislation is to "ensure that Canberra and the Territory are planned and developed in accordance with their national significance".[6] The parts of the ACT classified as National Capital Land are subject to a dual planning scheme, where the Australian Government and the ACT Government share planning responsibility.[7]

A key objective of the National Capital Plan is to "support and promote environmentally responsible urban development practices".[8] The National Capital Plan limits urban development on the hills and ridges around Canberra, supporting its position as the "bush capital", and providing some protection to the ACT's natural values.

The National Capital Plan includes a *Statement of Planning Principles* for the planning and development of Canberra and the Territory, and the objectives and principles are binding on both the Australian and ACT Governments. Along with principles on urban design, infrastructure and heritage, are two objectives for "Environmental sustainability and open space" under the principle of "Sustainability":[9]

3 Australian Government, 2024. *National Capital Plan 1990 (December 1990), Compilation No 32.*
4 Australian Government, Department of Finance, 2021. *National Land – Australian Capital Territory*. Available at: https://www.finance.gov.au/publications/strategy/national-land-australian-capital-territory
5 ibid.
6 Australian Government, 2024. *National Capital Plan 1990 (December 1990), Compilation No 32.*
7 Australian Government, National Capital Authority, n.d. *Planning in the National Capital*. Available at: https://www.nca.gov.au/planning/planning-act
8 Australian Government, 2024. *National Capital Plan 1990 (December 1990), Compilation No 32.*
9 Australian Government, 2024. *National Capital Plan 1990 (December 1990), Compilation No 32*, s 2.3.

Objective One – Ensure the development of a city that both respects environmental values and reflects national concerns with the sustainability of Australia's urban areas.

Principles:

a. Urban expansion should be contained so as to minimise impacts on valuable natural and rural areas.

b. A substantial portion of new development must be located within existing urban areas such as town centres and along public transport routes or other strategic sites that allow for efficient use of infrastructure.[10]

c. The natural environment of Canberra and the Territory will be protected and improved by reducing resource consumption and waste, improving water security and quality, energy and food security and improving and protecting soil quality.

d. Ecological communities, threatened flora and fauna species, water catchments and water quality will be protected and supported by sustainable resource management.

e. Development will respect environmental values including water catchments and water quality and ensure resilience to the impacts of climate change.

Objective Two –Protect the nationally significant open-space network, visual backdrop and landscape setting of the National Capital.

Principle:

a. The hills, ridges and other major open space will be kept largely free of urban development and will act as a natural backdrop to the National Capital.

These objectives and principles show a clear direction for the protection of the natural environment of the ACT, alongside development. The Plan states that "These Principles must be considered in the planning and development of Canberra and the Territory and in policies guiding these matters. The objectives and principles stated in this section are binding on both the Australian and ACT Governments".[11] No mechanism for how the implementation of these principles are monitored or assessed is provided.

Belconnen Town Centre. Source: EPSDD

10 This is supported by the ACT Planning Strategy goal of up to 70 per cent of new housing to be built within the existing urban footprint. See ACT Government, 2018. *ACT Planning Strategy*, p.10.

11 Australian Government, 2024. *National Capital Plan 1990 (December 1990), Compilation No 32*, Part 2 Explanatory Statement.

Overlooking Harrison from Goorooyaroo Nature Reserve. Source: Richie Southerton

4.1.2 ACT legislation

Planning (Land and Environment) Act 1991 and associated policy

The *Planning (Land and Environment) Act 1991* (Planning Act 1991) was in force at the start of the time period examined by this Investigation, and was not repealed until 2007. The Object of the Planning Act 1991 was:

> "to ensure, in a way not inconsistent with the National Capital Plan, that the planning and development of the ACT provides the people of the ACT with an ecologically sustainable, healthy, attractive, safe and efficient environment in which to live, work and have their recreation."[12]

The Planning Act 1991 set out the definition of "environmental impact" to be considered when submitting and assessing development proposals:[13]

Environmental impact, in relation to a proposal that is the subject of a defined decision, includes the following potential effects of the proposal (if carried out), either by itself or in combination with the potential effects of another such proposal:

a. environmental effect on a community
b. physical, biological or cultural transformation of an area
c. environmental effect on the social system or the ecosystems of an area
d. change to the aesthetic, recreational, scientific or other environmental qualities, or values, of an area
e. environmental effect on any premises or land or the surroundings of any premises or land, that has heritage significance
f. the endangering, or further endangering, of a community or an area
g. the endangering, or further endangering, of any species of fauna or flora
h. long-term environmental effects including those with potential to place demands on the social system

12 ACT Government, 2008. *Land (Planning and Environment) Act 1991 (ACT), Republication No 39*, s 7(1).
13 ACT Government, 2008. *Land (Planning and Environment) Act 1991 (ACT), Republication No 39*, s 111.

i. curtailing of the range of beneficial uses of the environment
j. pollution
k. problems associated with the disposal of waste
l. increased demands on natural resources that are, or are likely to be, in short supply
m. change to the values or lifestyles of particular groups and communities or to existing social relationships, and
n. socioeconomic effect.

The scope of the potential for environmental impact was large, and the Act provided a clear outline of potentially impacted areas.

Under the Planning Act 1991, proponents could be required to provide preliminary assessments of the environmental impact of a proposal for consideration in the form of an Environmental Impact Statement or a public environment report, as directed by the Environment Minister. The process for providing one of these reports was complex, with the ability to seek significant extra information, a process for public consultation, and the requirement for the Minister to provide their findings about the environmental impact of a proposal to the Legislative Assembly.

The 2004 release of *The Canberra Plan* outlined an approach to the future of Canberra that:[14]

- recognises and respects Canberra's unique built heritage and natural environment, yet
- plans for and promotes urban growth, but growth within a contained urban structure that will support strategies for sustainable development of Canberra.

The Plan emphasised the importance of living with the environment, retaining the landscape character of the "Bush Capital" and minimising impacts on the environment.

Canberra, the 'Bush Capital'. Source: EPSDD

14 ACT Government, 2004. *The Canberra Plan*, p.4.

This approach was reflected in the *Canberra Spatial Plan*, which sat under *The Canberra Plan*, and was designed to "provide clear strategic directions for the development of Canberra over the next 30 years and beyond".[15] It was established as "the Territory's key strategic planning document for directing and managing urban growth and change."[16] The *Canberra Spatial Plan* included an Urban Growth Containment Line, to contain growth within approximately 15 kilometres of the city centre in the next (then) 30 years (to 2034), and a Residential Intensification Line, so that least 50 per cent of all residential development would occur within 7.5 kilometres of the city centre in the (then) next 15 years (to 2019).

However, by 2008, the ACT Government introduced *The Canberra Plan: Towards Our Second Century*.[17] The importance of the *Canberra Spatial Plan* was scaled back, and mention of an urban growth boundary was removed. *The Canberra Plan: Towards Our Second Century* outlines the importance of protecting Natural Temperate Grassland and Yellow-Box Red-Gum Grassy Woodland from urban development but does not explain how this would occur.

Planning and Development Act 2007 and associated policy

This Investigation focuses on environmental decline in the ACT over the 20 years, which has occurred primarily while the *Planning and Development Act 2007* (Planning Act 2007) was in force. This legislation stated:[18]

> The Object of this Act is to provide a planning and land system that contributes to the orderly and sustainable development of the ACT –
>
> a. Consistent with the social, environmental and economic aspirations of the people of the ACT; and
>
> b. In accordance with sound financial principles.

The Planning Act 2007 sets out the meaning of sustainable development:[19]

> Sustainable development means the effective integration of social, economic and environmental considerations in decision-making processes, achievable through implementation of the following principles:
>
> a. The precautionary principle[20]
>
> b. The inter-generational equity principle[21]
>
> c. Conservation of biological diversity and ecological integrity, and
>
> d. Appropriate valuation and pricing of environmental resources.

15 ACT Government, 2004. *The Canberra Spatial Plan*, p.1.
16 ibid.
17 ACT Government, 2008. *The Canberra Plan: Towards Our Second Century*.
18 ACT Government, 2023. *Planning and Development Act 2007, Republication No 109*, s 6.
19 ACT Government, 2023. *Planning and Development Act 2007, Republication No 109*, s 9.
20 Defined by the Act as "if there is a threat of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation".
21 Defined by the Act as "the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations."

While probable environmental impacts had to be considered in all development applications, the consideration of environmental impacts under the Planning Act 2007 was largely limited to "significant adverse environmental impacts", defined as:[22]

a. The environmental function, system, value or entity that might be adversely impacted by a proposed development is significant, or
b. The cumulative or incremental effect of a proposed development might contribute to a substantial adverse impact on an environmental function, system, value or entity.

This was a notable narrowing of the scope of environmental impacts compared with previous legislation, particularly when limiting action to situations only where the impact is considered "significant". The words "cumulative" and "incremental" appear nowhere else in the Planning Act 2007; guidance on how these cumulative impacts were to be measured and monitored was lacking, as was a clear, quantifiable and consistent definition of "significant".

The Planning Act 2007 allowed for an Environmental Significance Opinion to be sought under circumstances where the proponent considered that their proposal was not likely to have a significant adverse environmental impact on a listed threatened species, or where impacts on nationally threatened matters had already been dealt with through the Commonwealth process (refer to section 4.2.1 below on the EPBC Act). If an Environmental Significance Opinion was not applied for, the proponent was required to provide an Environmental Impact Statement to outline the impacts of their proposal. However, impacts to native species not listed in legislation, or natural features such as waterways or rocky outcrops, were not required to be included.

Bettongs are regionally conservation dependent.
Source: Ryan Colley

Part 4.3 of the Planning Act 2007 outlined specific circumstances where an Environmental Impact Statement was required, including when a proposal that was likely to have a significant adverse environmental impact on one or more of the following:[23]

a. a critically endangered species
b. an endangered species
c. a vulnerable species
d. a conservation dependent species
e. a regionally threatened species
f. a regionally conservation dependent species
g. a provisionally listed threatened species
h. a listed migratory species
i. a threatened ecological community

22 ACT Government, 2023. *Planning and Development Act 2007, Republication No 109*, ss 124A(1).
23 ACT Government, 2023. *Planning and Development Act 2007, Republication No 109*, Schedule 4, Part 4.3.

j. a protected native species

k. a Ramsar wetland

l. any other protected matter.

An Environmental Impact Statement was also required for clearing of native vegetation of an area more than 0.5 ha if not in a designated Future Urban Area. If the native vegetation was in a Future Urban Area, this threshold rises to 5 ha.[24]

The Planning Act 2007 also set out requirements for offsets for situations in which there is a "significant adverse environmental impact".

The Planning Act 2007 was supported by two iterations of the planning strategy – the *Planning Strategy 2012* and the *Planning Strategy 2018*, which is still in place in 2025. With regards to environmental sustainability, the *Planning Strategy 2018* is an improvement on the *Planning Strategy 2012*, which had little focus on managing impacts on biodiversity as a result of planning policy.[25] The *Planning Strategy 2012* referred to "balancing where greenfield expansion occurs" (Theme 1) and "value the land and natural resources of the region" (Theme 8), but there was little material in the strategy to back up these plans. The focus of the *Planning Strategy 2012* was the approach to development around existing urban areas, although its vision did include:

- In 2030 Canberra will be the "capital in the bush", recognised for the quality of its public places and buildings that reflect its unique climate, character and identity; and
- In 2030 Canberra will be at the centre of a region that demonstrates the benefits of good stewardship of the land, its resources and the beauty of the rivers, mountains and plains.

Belconnen Town Centre. Source: EPSDD

The *Planning Strategy 2018* addresses some of the gaps in the 2012 version. This includes setting a target for up to 70 per cent of new housing to be built within the existing urban footprint, noting that "any further expansion of the city must be balanced against the need to protect key environmental values". However, the infill target has no lower boundary, theoretically meaning even one per cent of infill would meet the target. The *Planning Strategy 2018* also aims to preserve the "bush capital" setting of Canberra, to look after natural resources, and to protect biodiversity and enhance habitat connectivity.

24 Note that a Future Urban Area does not designate future development footprints, but would include potential green spaces and reserves.

25 ACT Government, 2012. *ACT Planning Strategy: Planning for a sustainable city.*

The *Planning Strategy 2018* states under Direction 3.5 that "The ACT has well-established priorities for integrating biodiversity protection into planning and urban development. To protect our habitats and ecosystems from the future effects of climate change, we will continue to maintain biodiversity assets and improve habitat connections to improve landscape connectivity and resilience".[26] The following actions are listed to achieve this Direction:

- 3.5.1 Identify and establish environmental offset areas within planning processes to mitigate any unavoidable impacts of development on ecosystems and biodiversity of national significance and other protected matters.
- 3.5.2 Incorporate consideration of natural habitat and conservation areas into urban planning and design processes to promote habitat connectivity and support the establishment of biodiversity refuges.

***Planning Act 2023* and associated policy[27]**

In 2024, the *Planning and Development Act 2007* was replaced by the *Planning Act 2023*. It sets out land use rules, including the designation of an area of public land as a nature reserve.

One of the "principles of good planning" under the *Planning Act 2023* is for "natural environment conservation principles", under which sit a range of specific actions:[28]

a. Planning and design should promote healthy and resilient ecosystems, by –
   i. avoiding or minimising loss of habitat and other key threatening processes for biodiversity, and
   ii. considering cumulative and incremental environmental impacts
b. Planning outcomes should support the operation of environmental laws applying in the ACT
c. Policies, planning and design should integrate and promote –
   i. nature-based solutions to climate change and water security, and
   ii. the valuation and maintenance of the ecosystem services and amenity provided by a healthy natural environment.
d. Biodiversity connectivity and habitat values should be integrated across urban areas, including through appropriate planning for, and landscaping of, urban open space and travel corridors.

As described above, a key policy under the *Planning Act 2023* is the *Planning Strategy 2018*,[29] which sets out the long-term strategic direction and desired future planning outcomes for the Territory.

A Territory Plan has been in place underneath each iteration of planning legislation and planning strategy. In language mirroring previous Planning Acts, the Territory Plan was developed to:

> "ensure, in a manner not inconsistent with the National Capital Plan, that the planning and development of the ACT provides the people of the ACT with an attractive, safe and efficient environment in which to live, work and have their recreation."[30]

26 ACT Government, 2018. *ACT Planning Strategy 2018*, p.73.
27 As of 2025.
28 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6*, s 10.
29 ACT Government, 2024. *Frequently asked questions: ACT planning system*. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0008/2332529/act-planning-system-frequently-asked-questions-20240214.pdf
30 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6*, s 46.

Crace towards Gungahlin. Source: EPSDD

It "sets out a statutory framework for the future development and conservation of land in the ACT", and notes that the *Heritage Act 2004, ACT Nature Conservation Act 2014* and the *Environmental Protection and Biodiversity Conservation Act 1999* should be complied with where necessary.

Nine District Strategies sit above the *Territory Plan 2023*. As per the EPSDD 2022–23 Annual Report,[31] the district strategies "identify a series of change areas and key sites where future growth is proposed best to occur. Most of these sites are within the urban footprint, directly contributing to achieving the planning strategy 70 per cent infill target".

The District Strategies also identify the "Urban ACT Ecological Network". The Urban ACT Ecological Network is a forward-looking aspiration of what a connected network of wildlife habitat across Canberra could look like. The Ecological Network incorporates protected conservation areas, waterbodies and creek lines and sensitive ecological communities, as well as core wildlife habitat and existing and potential future ecological corridors identified through connectivity modelling. It includes natural and semi-natural areas. Development on sites within the Ecological Network should focus on creating or maintaining ecological connectivity and implement all Biodiversity Sensitive Urban Design elements as applicable. Areas in the Ecological Network are also highly suitable for biodiversity restoration projects, because as an added benefit, ecological connectivity is also enhanced.

The *Territory Plan 2023*[32] indicates "the desired planning outcomes, land use zones and development assessment provisions"[33] and implements the overall planning and district strategies. It guides planning and development in the ACT with a range of district and zone policies to inform developers and support decision-making by the Territory Planning Authority.[34] The *Territory Plan 2023* replaced the *Territory Plan 2008* as part of the ACT Planning System refresh.

31 ACT Government, Environment, Planning and Sustainable Development Directorate, 2023. *Annual Report 2022–23.* Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0017/2320235/2022-23-epsdd-annual-report.pdf

32 ACT Government, 2023. *Territory Plan 2023 (ACT).*

33 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6*, s 8(2)(c).

34 ACT Government, Planning, n.d. *The Territory Plan.* Available at: https://www.planning.act.gov.au/professionals/our-planning-system/the-territory-plan

Also under the *Planning Act 2023* sits the *Biodiversity Sensitive Urban Design Guide*, a notifiable instrument.[35] This design guide "communicates the ACT Government's intent to deliver high-quality best-practice biodiversity sensitive, ecologically sustainable design outcomes across new developments within Canberra."[36] The document recognises the interlinks between various policies, noting that there are 18 government instruments relating to urban biodiversity.

The projected assessment outcomes for the *Biodiversity Sensitive Urban Design Guide* include the following:

- loss of native habitat and biodiversity is avoided or minimised
- biodiversity connectivity is maintained across the landscape, and
- threats to biodiversity such as noise, light pollution, invasive species incursions or establishment, chemical pollution or site disturbance are avoided or minimised through good design/planning.

The Indicative Land Release Program[37] is designed to support the *Planning Strategy 2018* by identifying ACT Government land which is intended to be released for residential, mixed-use, commercial, industrial, and community and non-urban land. The Indicative Land Release Program is managed by the Suburban Land Agency and City Renewal Authority and has a range of goals, including "contributing to building a compact and efficient city and supporting sustainable growth by working towards 70 per cent of new housing within the existing urban footprint" and "supporting the development of a sustainable and resilient city in the landscape by promoting the efficient use of land and being responsive to change."[38] However, another goal is "achieving satisfactory returns to the Territory Budget." The process by which tensions between these goals are managed has not been articulated in the program.

Kangaroo Grass in Mulligans Flat. Source: Mark Jekabsons

35 ACT Government, 2023. *Planning (Biodiversity Sensitive Urban) Design Guide 2023, Notifiable instrument NI2023-543.*

36 ACT Government, 2023. *ACT Biodiversity Sensitive Urban Design Guide.* Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0011/2324675/ACT-Biodiversity-Sensitive-Urban-Design-Guide.pdf

37 ACT Government, Planning, n.d. *Land release.* Available at: https://www.planning.act.gov.au/professionals/land-release-sales/land-release

38 ACT Government, Suburban Land Agency, n.d. *Indicative Land Release Program.* Available at: https://suburbanland.act.gov.au/about-us/indicative-land-release-program

4.2 Overview of conservation and biodiversity legislation

Canberra's reserved areas cover around 146,800 ha, accounting for over 60 per cent of the ACT's total area (higher than any other Australian jurisdiction). Protected areas are classified based on their conservation priorities.

- National Parks, and specifically Namadgi National Park, focus on biodiversity and cultural heritage protection with controlled recreation. Namadgi National Park and Bimberi Wilderness Area comprise over 75 per cent of conservation lands, making up about 47 per cent of the ACT.
- Nature reserves cover 14 per cent of the ACT. They include Canberra Nature Park (a network of urban reserves) and Jerrabomberra Wetlands. They emphasise habitat conservation to protect native species and facilitate urban access to nature and leisure values. River corridors, such as the Murrumbidgee River Corridor and sections of the Molonglo River, also form part of the nature reserve network, and balance conservation with recreational use to protect river ecosystems and maintain water quality.

Special Purpose Reserves, including Tidbinbilla Nature Reserve and Mulligans Flat Woodland Sanctuary, are tailored to specific goals like endangered species protection and have regulated access.

Water Supply Protection Areas, such as the Lower Cotter Catchment and Bendora Catchment, cover four per cent and are managed to ensure water quality, with limited public access.

Since 1997, conservation areas have expanded by approximately 13,470 ha, with recent additions like the Molonglo River Reserve (1,200 ha), which incorporates 490 ha of conservation land. Other recent additions to the conservation estate include the Nadjung Mada (163 ha) and Franklin Grasslands (20 ha).

Despite these increases, there is still an underrepresentation of lowland grasslands and woodlands as a percentage of protected areas. Further, while the management of nature reserves falls under biodiversity legislation, the designation of nature reserves is a function of the Territory Plan.[39]

4.2.1 Federal considerations

The *Environmental Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the key federal conservation legislation that applies to the ACT. Developments that are likely to have an impact on matters of national environmental significance (MNES), including endangered plants, animals, and heritage places must be assessed and approved under the EPBC Act before they can proceed. Projects may be approved with conditions to avoid and mitigate significant impacts to MNES, and offsets may be required (measures such as the protection of a threatened habitat) if significant impacts are expected.[40] However, if the impact is not deemed to be significant, there may be no conditions attached to the approval.[41]

39 ACT Government, Planning, n.d. *The Territory Plan*.
Available at: https://www.planning.act.gov.au/professionals/our-planning-system/the-territory-plan

40 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2025. *Referrals and environmental assessments under the EPBC Act*.
Available at: https://www.dcceew.gov.au/environment/epbc/approvals#receive-the-assessment-decision

41 Australian Government, Department of Sustainability, Environment, Water, Population and Communities, 2012. *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*.
Available at: https://www.dcceew.gov.au/sites/default/files/documents/offsets-policy_2.pdf

Molonglo River Reserve. Source: Richie Southerton

Prior to changes to ACT planning legislation in 2023, the federal government had an assessment bilateral agreement with the ACT, which allowed the ACT Government to assess proposals determined to be 'controlled actions' within the Territory on behalf of the federal government, which would then make a final decision. There is currently no bilateral agreement in place.

The EPBC Act also provides for the consideration of Strategic Assessments, which are a landscape-scale "big picture approach" to assessments, including potential environmental impacts on matters of national ecological significance.[42] These are designed to be more efficient assessments, by considering a larger project (such as a housing development) and provide an upfront approval on the entire project. There is no requirement to refer individual developments to the Commonwealth once a decision has been made to approve the actions assessed in a strategic assessment. These approvals may also require offsets for identified environmental impacts. In the ACT, there are currently four strategic assessments:

- Eastern Broadacre (under development)
- Gungahlin
- Molonglo Valley Plan, and
- West Belconnen (ACT and New South Wales).

These strategic assessments have supported greenfield developments in the ACT, despite impacts on key threatened species and threatened ecological communities.

42 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2024. *Strategic assessments of an endorsed policy, plan or program*. Available at: https://www.dcceew.gov.au/environment/epbc/approvals/strategic-assessments#:~:text=Strategic%20assessments%20are%20landscape-scale%20assessments%20defined%20under%20the,nationally%20significant%20%28protected%29%20animals%2C%20plants%2C%20habitats%20or%20places.

Expert comment – Dr Megan C Evans
UNSW Canberra
Environmental regulations in Australia: current state of play, and shortcomings

Australia's natural environment is governed by a combination of federal, state and territory, and local government laws and regulations. The role of the federal government in this "scrambled egg"[43] of environmental protections is very important, given Australia's obligations under international treaties such as the Convention on Biological Diversity, and the tendency for subnational governments to be conflicted in decisions regarding income-generating developments that may have detrimental environmental impacts. Over 2,100 nationally significant plant and animal species[44] and many more ecosystems and places (such as National and World Heritage) are regulated under Australia's federal environmental legislation, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

While the federal government and its environmental powers can play a key role in regulating development impacts to nationally significant biodiversity (and has in decisions such as the Traveston Dam in 2009, and more recently Toondah Harbour in 2024), the EPBC Act is widely regarded as being overall ineffective in protecting Australia's environment. An independent review of the Act is required by law every decade, with the most recent conducted in 2020 by Professor Graeme Samuel AC. Similar to the independent Hawke Review of the EPBC Act in 2009, the Samuel Review made a broad suite of recommendations to improve the Act's performance. In particular, Professor Samuel emphasised that the Act requires fundamental reform to enable the federal government to set, monitor and evaluate national environmental outcomes, to actively restore Australia's environment and reverse its overall state of decline, and to value and incorporate Indigenous knowledge into regulatory decisions.[45] Specific reforms, including legally enforceable National Environmental Standards and independent, statutory Environment Assurance Commissioner were recommended to occur over three phases in a two-year period to 2022.

Following the release of the Samuel Review in early 2021, the federal Morrison government sought to amend the EPBC Act in June that year to introduce interim national environmental standards and an Environment Assurance Commissioner (with limited powers and resourcing). The Bill ultimately did not progress through the Senate, and a new federal government was elected in May 2022. Prior to that federal election, the Labor Party promised, if elected, to establish an independent Environment Protection Agency, and to provide a full response to the Samuel Review.[46] That response, the *Nature Positive Plan: better for the environment, better for business*[47]

43 McGrath, C., 2012. *Australia's scrambled egg of government: who has the environmental power?* The Conversation, published on 5 December 2012. Available at: https://theconversation.com/australias-scrambled-egg-of-government-who-has-the-environmental-power-9582

44 Australian Government, Department of Climate Change, Energy, the Environment and Water, n.d. *Species Profile and Threats Database*. Available at: https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

45 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report*. Prepared for the Department of Agriculture, Water and the Environment.

46 Labor Environmental Action Network, 2022. *2022 Election Environment and Climate commitments*. Available at: https://www.lean.net.au/2022_election_enviro_climate_commitments

47 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2022. *Nature Positive Plan: Better for the environment, better for business.*

was published in December 2022, but specific consultation on national environmental laws did not commence until October 2023[48] with the federal government prioritising its new voluntary Nature Repair Market legislation over that time period.

Consultation on the newly drafted national environmental laws, called the Nature Positive Bill, occurred up to March 2024 and involved targeted, "lock up" style consultations with key stakeholder groups[49] and limited public consultation.[50] Although the federal government had drafted a full environmental law reform package, in April 2024 it was announced that only two parts – Bills to establish federal Environmental Protection Australia and Environment Information Australia agencies – would be introduced into Parliament, with substantive reform of the central EPBC Act indefinitely delayed.[51] By the end of 2024, neither of these two Bills had progressed through the Australian Senate, with the Prime Minister and Western Australian Premier reportedly playing key roles in ensuring the Nature Positive Bills were not put to a vote before the end of year closure of Parliament.[52] With the next federal election set to occur in the first half of 2025, at the time of writing it seems highly unlikely that federal environmental law reform will occur anytime soon.

As of January 2025, the EPBC Act is largely in the same state as it was prior to the second independent review in 2020. What are the consequences for the last five years of policy activity, and ultimately inaction, on Australia's federal environmental regulations? Unfortunately, it means that well-known deficiencies in the EPBC Act remain in place, including an inability to manage cumulative impacts (or "death by a thousand cuts"[53]), ineffective environmental assessments and approvals processes,[54] poor compliance and enforcement,[55] an environmental offset system that leads to net loss of biodiversity,[56] lack of community trust and scope for genuine participation, no consideration of greenhouse gas emissions from developments under federal environmental impact assessment, and no clear environmental outcomes or goals specified under the legislation.[57]

48 Australian Government, Department of Climate Change, Energy, the Environment and Water, n.d. *Australia's new Nature Positive laws*. Available at: https://consult.dcceew.gov.au/australias-new-nature-positive-laws

49 Mizen, R. and Greber, J., 2023. *'Unusual' briefings signal looming brawl on Labor nature law overhaul.* Australian Financial Review, published on 31 October 2023. Available at: https://www.afr.com/politics/federal/unusual-briefings-signal-looming-brawl-on-labor-nature-law-overhaul-20231030-p5eg7a

50 Australian Government, Department of Climate Change, Energy, the Environment and Water, n.d. *Australia's new Nature Positive laws public webinars*. Available at: https://consult.dcceew.gov.au/australias-new-nature-positive-laws/public-webinars

51 Ritchie, E., Evans, M. and Chee, Y. E., 2024. *Australia's long-sought stronger environmental laws just got indefinitely deferred. It's back to business as usual*. The Conversation, published on 17 April 2024. Available at: https://theconversation.com/australias-long-sought-stronger-environmental-laws-just-got-indefinitely-deferred-its-back-to-business-as-usual-228090

52 Cox, L. and Middleton, K. 2024. *Albanese kills off deal with Greens to pass 'nature positive' legislation after intervention by WA premier*. The Guardian, published on 27 November 2024. Available at: https://www.theguardian.com/australia-news/2024/nov/27/albanese-kills-off-deal-with-greens-to-pass-nature-positive-law-after-intervention-by-wa-premier

53 For example, see Reside, A., Cosgrove, A., Pointon, R., et al, 2019. *How to send a finch extinct*. Environmental Science & Policy, 94, 163–173.

54 Australian National Audit Office, 2020. *Auditor-General Report No.47 2019-20 – Referrals, Assessments and Approvals of Controlled Actions under the Environment Protection and Biodiversity Conservation Act 1999*, p.78.

55 Thomas, H., Ward, M., Simmonds, J., et al, 2024. *Poor compliance and exemptions facilitate ongoing deforestation.* Conservation Biology, 39(1).

56 Evans, M. C., 2023. *Backloading to extinction: Coping with values conflict in the administration of Australia's federal biodiversity offset policy*. Australian Journal of Public Administration, 82(2), 228–247.

57 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report*. Prepared for the Department of Agriculture, Water and the Environment.

In the meantime, Australia has committed at the international level to reversing biodiversity loss by 2030 under the Kunming-Montreal Global Biodiversity Framework.[58] To achieve this commitment, the Australian Government must urgently reform federal environmental law based on recommendations by Professor Samuel and scientists, invest in nature conservation and restoration in line with community expectations,[59] and not engage in "nature positive greenwash".[60]

The next legislated decadal review of the EPBC Act is due to commence in 2029.

4.2.2 ACT legislation

Nature Conservation Act 1980

The *Nature Conservation Act 1980* was the key environmental protection legislation in place during the first half of the time period covered by this Investigation. Originally an ordinance prior to self-government, it is described as "An Act to make provision for the protection and conservation of native animals and native plants, and for the reservation of areas for those purposes",[61] and was significantly added to over time. However, the discussion paper for the 2008 review of the *Nature Conservation Act 1980* noted "Monitoring of ACT lowland birds, reptiles and mammals has revealed a dramatic decline in both wildlife abundance and species diversity" and "Key vegetation remnants have generally been retained as conservation reserves. However, ongoing urban expansion has fragmented these remnants and led to deterioration in their condition. Weed and exotic animal invasion, fire management and recreation pressures are significant factors".[62] Further, a report undertaken on behalf of the Government noted compliance and enforcement issues, and that a more robust approach was needed to ensure the objectives of the Act are met.[63]

When it was repealed, the Explanatory Statement for the Nature Conservation Bill 2014 stated that "the legislation that has guided the ACT's approach to nature conservation and biodiversity protection is over thirty years old and has had a range of policy and technical amendments over time, in particular through development of subsidiary regulatory instruments. The result is fragmented nature conservation and biodiversity laws that were less transparent than they should be."[64]

Nature Conservation Act 2014

The *Nature Conservation Act 2014* is the current primary ACT legislation designed to protect, conserve and enhance the biodiversity of the ACT. It is the legislation under which the Conservator of Flora and Fauna is appointed, and sets out the requirement for the Conservator to develop a nature conservation strategy. The aim of this legislation is the protection of native species and their habitats, ecological communities,

58 Convention on Biological Diversity, 2022. *COP15: Final text of Kunming–Montreal Global Biodiversity Framework*. Available at: https://www.cbd.int/article/cop15-final-text-kunming-montreal-gbf-221222

59 Biodiversity Council, 2024. *2024 Biodiversity Concerns Report: A survey of community attitudes to nature conservation.* Available at: https://biodiversitycouncil.org.au/admin/uploads/2024_Biodiversity_Concerns_Report_f6ea3e5ee1.pdf

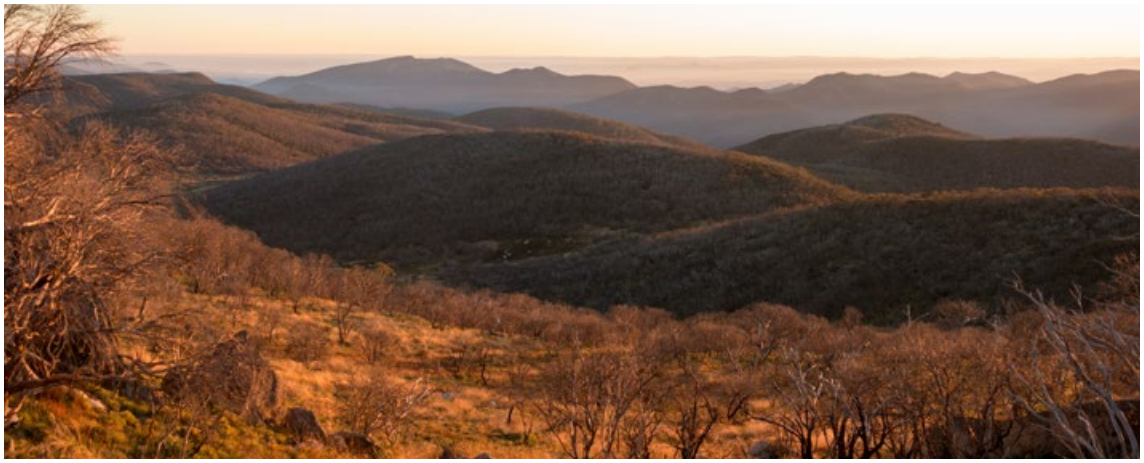
60 Evans, M. C., Possingham, H. and Wintle, B., 2024. *Threatened species have declined 2 per cent a year since 2000. Nature positive? Far from it*. The Conversation, published on 17 May 2024. Available at: https://theconversation.com/threatened-species-have-declined-2-a-year-since-2000-nature-positive-far-from-it-230116

61 ACT Government, 2015. *Nature Conservation Act 1980 (ACT), Republication No 29.*

62 ACT Government, Department of the Environment, Climate Change, Energy and Water, 2010. *Review of the Nature Conservation Act 1980: Enhancing nature conservation in the Australian Capital Territory – Discussion Paper.*

63 Marsden Jacob Associates, 2008. *Enhancing nature conservation policy in the ACT: outcomes from the review of the Nature Conservation Act 1980*. Prepared for the ACT Government.

64 ACT Government, 2014. *Nature Conservation Bill 2014 – Explanatory Statement.*



View from Mt Gingera, Namadgi National Park. Source: Mark Jekabsons

and biological diversity. It also recognises the roles and knowledge of Aboriginal and Torres Strait Islander people in meeting these goals. Another key aim of the legislation is to promote the principles of ecologically sustainable development, although the mechanisms by which it does this are unclear.

Under the *Nature Conservation Act 2014*, there are currently 66 species listed as threatened:[65]

- 10 critically endangered
- 27 endangered
- 29 vulnerable
- one regionally conservation dependent.[66]

Notably, not all species are listed to the same level in federal and ACT legislation, although there is currently work being undertaken to align lists of threatened species across jurisdictions under the Common Assessment Method.[67] However, this means that the protection offered to these species depends on the legislation under which they are being considered.

The *Nature Conservation Act 2014* sets out the definition of reserves and wilderness areas. It also reflects the International Union for Conservation of Nature (IUCN) categories as outlined in the EPBC Act, and how reserves can be assigned to an IUCN category for protection and appropriate management.

Reserve Management Plans are defined under the *Nature Conservation Act 2014*, as well as the requirements for their development, approval, and implementation. As part of this, the custodian of the reserve must report on the implementation of the management plan at least once every five years, and for reserve management plans to be reviewed every 10 years after the plan commences (or any other time at the Minister's request).[68] The ACT Parks and Conservation Service manages these reserves.[69] The *Nature Conservation Act 2014* is required to be reviewed every 10 years, and is currently under review, along with the *ACT Nature Conservation Strategy 2012–2023.*

65 ACT Government, ACT Threatened Species. Available at: https://www.act.gov.au/environment/animals-and-plants/act-threatened-species

66 NB. The Golden Sun Moth is listed as both 'Vulnerable' and 'Endangered' on this list.

67 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2024. *Common Assessment Method*. Available at: https://www.dcceew.gov.au/environment/biodiversity/threatened/cam

68 ACT Government, 2024. *Nature Conservation Act 2014 (ACT), Republication No 32*, ss 189(2)(3).

69 ACT Government, n.d. *Reserve management plans*. Available at: https://www.act.gov.au/environment/parks-and-conservation/conservation/conservation-strategies/reserve-management-plans

ACT Natural Resource Management (NRM) is one of 54 regional natural resource management organisations in Australia, and supports the restoration of the environment as the Australian Government's Regional Delivery Partner for the ACT. It is guided in part by the *Nature Conservation Act 2014*.[70] Unlike other such organisations, ACT NRM is the only regional body to sit within a state or territory government.

ACT Nature Conservation Strategy 2012–2023

Both nature conservation acts have a requirement for the Conservator to prepare a Nature Conservation Strategy. The *ACT Nature Conservation Strategy 2013–2023*[71] is designed for use by land management, planning, business and community sectors to guide nature conservation. The key outcomes for the strategy are:

- Outcome 1: Native vegetation and biodiversity is maintained and improved.
- Outcome 2: Landscapes are more resilient, including to climate change.
- Outcome 3: Community health and wellbeing is increased through use and appreciation of natural areas and "green assets" in urban areas.

It outlines a focus on management and restoration of urban, rural, water catchment and river corridor landscapes, enhancing ecological connectivity (including through urban areas), and management of threats to biodiversity. However, the impact of the Nature Conservation Strategy is difficult to glean from the most recent progress report (2023).[72] There appears to be a mismatch with the indicators in the Nature Conservation Strategy, and monitoring for some indicators had not been undertaken or had a lack of specific indicator data.

The Swift Parrot is critically endangered in the ACT. Source: Ryan Colley

70 ACT Government, n.d. *About natural resource management*. Available at: https://www.act.gov.au/environment/land/about-natural-resource-management

71 ACT Government, Environment and Sustainable Development Directorate, 2013. *ACT Nature Conservation Strategy 2013–23.*

72 ACT Government, 2024. *ACT Nature Conservation Strategy 2013-2023 – Progress Against Implementation Plan 2 (2019-2023).* Available at: https://www.act.gov.au/__data/assets/pdf_file/0009/2779344/act-nature-conservation-strategy-2013-23-progress-against-implementation-plan-2.pdf

With regards to development, the Nature Conservation Strategy recognises that decisions about land use are made under the *Planning and Development Act 2007*. Further, the "Threats" section does not refer to the management of impacts by development on the environment. The Nature Conservation Strategy does however require the ACT to "manage impacts of urban development on biodiversity".

The Nature Conservation Strategy is currently under review, with the replacement strategy to be finalised in 2025.

There are also a range of strategies that support conservation in the ACT, including (but not limited to) the:[73]

- Aquatic and Riparian Conservation Strategy
- Native Grassland Conservation Strategy
- Native Woodlands Conservation Strategy
- Mature Native Trees Action Plan
- Pest Animal Management Strategy, and
- Invasive Plants Plan.

However the strategies have varying levels of monitoring and reporting, meaning there is little oversight of the success of the activities undertaken.

Urban greenspace enhances community health and wellbeing. Source: EPSDD

73 ACT Government, n.d. *Conservation strategies*.
Available at: https://www.act.gov.au/environment/parks-and-conservation/conservation/conservation-strategies

The Pinnacle Nature Reserve. Source: Nathanael Coyne

4.3 Other relevant legislation, policy, plans and strategies

4.3.1 Environmental offsets

In between planning legislation and conservation policy sit environmental offsets, which are intended to provide environmental compensation for a significant environmental impact as the result of development.[74] Generally, this requires an area of habitat to be formally (legally) protected and managed as an 'averted loss offset site' for the duration of the impact at the impact site in response to that same habitat being destroyed elsewhere. As offsets are a sustainable development measure, they are managed through the *Planning Act 2023* in accordance with EPBC approvals. Further, offsets may be a requirement of approvals under the EPBC Act, however:

> *Offsets are not specifically provided for in the EPBC Act. Their use is based on an interpretation of the power to attach conditions to the grant of an approval. How these conditions are specified at the time the approval is granted is critical, but not of itself sufficient to ensure that an effective and legally permanent and secure offset site is established. That must be done through a subsequent process of legal protection.*[75]

The Ten Year Review of the *Nature Conservation Act 2014* – Discussion Paper noted that while the ACT had developed an offsets policy, it was not fully implemented, and the ACT has been operating its environmental offsets in line with the EPBC Act. This approach means that only nationally protected matters, not ACT matters, are covered by the offset policy. The federal offsets approach is not enshrined in law[76] (though it has been recommended to be) and is held in a separate policy associated with the assessment of actions under the EPBC Act.[77]

The ACT holds an Offsets Register which lists details of each offset under the EPBC Act, as well as annual reports and monitoring program reports.

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74 ACT Government, 2024. *Ten Year Review of the Nature Conservation Act 2014 – Discussion Paper*. Available at: https://hdp-au-prod-app-act-yoursay-files.s3.ap-southeast-2.amazonaws.com/4217/1582/7427/Ten_Year_Review_of_the_Nature_Conservation_Act_2014.pdf

75 Australian Conservation Foundation, 2024. *Set and forget: How offsets under national environmental law drive habitat destruction*, p.6.

76 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report*. Prepared for the Department of Agriculture, Water and the Environment, p.19.

77 Australian Government, Department of Sustainability, Environment, Water, Population and Communities, 2012. *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*. Available at: https://www.dcceew.gov.au/sites/default/files/documents/offsets-policy_2.pdf

Eucalypt. Source: OCSE

4.3.2 *Urban Forest Act 2023*

With a focus on increasing Canberra's trees to 30 per cent canopy coverage across urban Canberra by 2045, the *Urban Forest Act 2023* protects trees on private and public land, establishes a register of significant trees, and introduces approval requirements for activities that may damage trees. It also recognises the potential for loss of mature native trees (including hollow-bearing trees) and a lack of recruitment of hollow-bearing trees listed as a key threatening process, by ensuring that trees must be retained in an appropriate ecological context and designed around during the development of new urban areas.[78] The goals of protecting trees and the explicit references to potential impacts during development are encouraging.

4.3.3 Human Rights Act

Expert comment – Associate Professor Cristy Clark
University of Canberra
The right to a healthy environment

On 28 July 2022, the United Nations General Assembly (UNGA) recognised the right to a clean, healthy and sustainable environment as a human right in international law.[79] This right is novel (at the international level) and important in focusing on the interrelationship between the full enjoyment of all human rights with the protection of the environment, including ecosystems.

Globally, around 80 per cent of United Nation countries (156 out of 193) recognise the right to a healthy environment through regional human rights treaties, national constitutions, or domestic legislation.[80] Australia was one of the 161 states that voted in favour of the UNGA resolution, but there has been limited legislative or other action taken to implement and realise this right at the domestic level. The Australian Capital Territory is a key exception to this and is leading the country through its recent recognition of the right to a healthy environment.[81]

ACT recognition of the right

In August 2024, the ACT Legislative Assembly passed the *Human Rights (Healthy Environment) Amendment Act 2024*, which will insert a new s 27C into the *Human Rights Act 2004* (ACT) recognising:

78 ACT Government, 2022. *Urban Forest Bill 2022 – Explanatory Statement and Human Rights Compatibility Statement.*
79 United Nations, 2022. *The Human Right to a Clean, Healthy and Sustainable Environment*, A/76/L.75.
80 United Nations, 2020. *Right to a healthy environment: good practices, Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment*, A/HRC/43/53.
81 ACT Government, 2024. *Human Rights (Healthy Environment) Amendment Act 2024 (ACT).*

1. Everyone has the right to a clean, healthy and sustainable environment.
2. Everyone is entitled to enjoy this right without discrimination.

Once s 27C has come into effect (by Ministerial notice or 17 March 2025 at the latest)[82] public authorities will be required to consider the impact on the right to a healthy environment, prior to making any decisions, in line with their obligations to act consistently with human rights.[83] If a member of the public believes that a public authority has acted in contravention of s 27C, they will also be able to bring a human rights complaint to the ACT Human Rights Commission for conciliation.[84] However, for the time being, it will not be possible to bring a stand-alone action to the Supreme Court to enforce s 27C (in contrast to the other rights protected under the Human Rights Act).[85]

As effective enforcement of environmental rights is a core element of the internationally recognised right to a healthy environment, the absence of a strong enforcement mechanism has been criticised for undermining the value of introducing this right.[86] Public controversy around the exclusion of litigation for s 27C was sufficient to lead to several amendments to the original Amendment Bill,[87] including a requirement that the Minister review the exclusion of litigation by October 2027 and that this exclusion automatically expire on 1 October 2028.[88]

What does the right to a healthy environment mean for the ACT?

The Special Rapporteur on the Right to a Healthy Environment defines the right to a healthy environment as being comprised of six substantive elements:

1. the right to clean air
2. the right to a safe climate
3. access to safe drinking water and sanitation
4. the right to healthy biodiversity and ecosystems
5. the right to live, work and play in toxic free environments, and
6. the right to healthy and sustainably produced food.[89]

In other jurisdictions, litigation over the right to a healthy environment has been used to require stronger action from the government of Colombia to protect the Atrato River from ongoing illegal mining and contamination[90] and the Amazon from deforestation;[91] to set aside a coal mine approval in South Africa;[92] to force the Pakistani Government

82 ibid, s 2.

83 ACT Government, 2024. *Human Rights Act 2004 (ACT), Republication No 16 (RI),* s 40B.

84 ACT Government, 2024. *Human Rights Commission Act 2005 (ACT), Republication No 47*, s 41D.

85 ACT Government, 2024. *Human Rights (Healthy Environment) Amendment Act 2024 (ACT)*, s 7 – which will insert a new ss 40C(5A) into the *Human Rights Act 2004* (ACT). (A new ss 40C(5B) does clarify that actions relying on other rights that overlap with the right to a healthy environment will be permitted.)

86 United Nations, 1993. *Vienna Declaration and Programme of Action.*

87 ACT Government, 2024. *Standing Committee on Justice and Community Safety Report No. 22 – Inquiry Into the Human Rights (Right To A Healthy Environment) Amendment Bill 2023 – Government Response*, p.1-2. Presented by Tara Cheyne to the Legislative Assembly for the Australian Capital Territory. (Note: the original bill already required such a review after five years, but this requirement was brought forward and strengthened by the addition of a sunset clause.)

88 ACT Government, 2024. *Human Rights (Healthy Environment) Amendment Act 2024 (ACT),* ss 8–9.

89 United Nations, 2020. *Right to a healthy environment: good practices, Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment*, A/HRC/43/53. See also A/HRC/40/55; A/74/161; A/HRC/46/28; A/75/161; A/HRC/49/53; A/76/179.

90 *Decision T-622* (Corte Constitucional (Colombia), 10 November 2016) ('*The Atrato River Case*').

91 *Demanda Generaciones Futuras v Minambiente (Future Generations v Ministry of the Environment and Others)* (2018) STC4360-2018 Supreme Court of Colombia 11001 22 03 000 2018 00319 00.

92 *EarthLife Africa Johannesburg v Minister of Environmental Affairs and Others* (High Court of South Africa (Gauteng Division, Pretoria), 19 November 2020).

to adopt more comprehensive climate adaptation policies,[93] and to compel the Government of Himachal Pradesh (India) to protect a glacier from black carbon pollution.[94] While there is limited heavy industry in the ACT, the right to a healthy environment will be relevant to future planning decisions around infrastructure, housing and commercial developments, and even events. It should also be a consideration in the Government's ongoing development and implementation of climate policies – including, for example, taking stronger measures to reduce both transport and scope 3 emissions, and continuing to develop and implement climate adaptation measures.

Non-discrimination

The Special Rapporteur has identified 16 Framework Principles for human rights and the environment that can guide States in the implementations of their obligations under the right to a healthy environment.[95] These Framework Principles include providing additional attention to vulnerable groups in society (principle 14) and the need to prevent discrimination and ensure equal enjoyment of a safe, clean, healthy and sustainable environment (principle 3). These non-discriminatory aspects of the right (reflected in the new s 27C(2) of the *Human Rights Act 2004*) are an important consideration for the ACT Government. While measures such as public landscaping (including urban tree cover), the Renters Home Energy Program, and Minimum Energy Efficiency Standard for Rental Properties are all important steps for ensuring everyone in the community benefits from climate policies, heavy reliance on financial subsidies for home and e-vehicle owners risks undermining equity.

Procedural rights

The procedural elements of the right to a healthy environment are also particularly relevant to the ACT. These include:

- the right to information
- the right to participate in decision-making, and
- access to justice.[96]

Beyond ensuring transparency, the right to information imposes an obligation on the Government to ensure accessible environmental information and education is available to all community members. The right to participation could serve as a catalyst to further deepen democracy in the ACT, including by encouraging widespread public engagement in planning decisions, climate policy making, and all other aspects of environmental decision making. Finally, access to justice raises the question of whether the community ought to be able to rely on the right to a healthy environment for a standalone action in the Supreme Court, or whether the ACT Human Rights Commission's conciliation process will prove sufficient.

93 *Leghari v Federation of Pakistan* (Lahore High Court, Syed Mansoor Ali Shah CJ, W.P. No. 25501/2015).

94 *In re Court on Its Own Motion v State of Himachal Pradesh and Others, National Green Tribunal*, Application no 237 (THC)/2013 (CWPIL no 15 of 2010) (6 February 2014).

95 United Nations, 2018. *Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, Framework principles on human rights and the environment*, A/HRC/37/59.

96 United Nations, 2020. Right to a healthy environment: good practices, Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, A/HRC/43/53, p.5–7.

4.3.4 Agricultural policies

Fifteen per cent of the ACT is farmland. In the absence of a specific agricultural policy, the *Canberra Region Local Food Strategy 2024–29*[97] provides some guidance around the use of rural land for farming.

With regard to agricultural policy, it states:

> *To date, the ACT has not had an established policy or strategy that details its vision for the agriculture sector. Historically, the policy relating to agricultural land has primarily been considered as a land use matter, with little focus on the economic or social outcomes that could be achieved through agriculture.*

The *Canberra Region Local Food Strategy 2024–29* also notes that there has been an increased interest in local and regional produce and strong support for a new agricultural policy, and that there is a requirement for a "new approach to food and agriculture in the ACT".

The ACT has a leasehold system of land tenure, rather than freehold. Chapter 10 of the *Planning Act 2023* sets out the different types of leases in the ACT, the granting of leases, planning conditions, and other matters. Residential leases are generally set for a term of 99 years (with the ability to apply to extend the lease).[98] Unlike residential leases, rural leases have no default term, but the intention is for the term to provide security of tenure to the lease holder.[99] An extension to a rural lease can involve additional costs. Concessional leases also exist to provide benefits to the ACT community, and may be provided for community organisations or economic growth of the Territory (for example).[100] Under all forms of leases, the lease may be altered if the Government wishes to acquire the land. Rural leases have no defined minimum or maximum term, except where the National Capital Authority has set a maximum lease term.[101]

Rural land at Winslade. Source: OCSE

97 ACT Government, 2024. *Canberra Region Local Food Strategy 2024-2029.*

98 ACT Government, Planning, n.d. *Crown leases*. Available at: https://www.planning.act.gov.au/community/buy/leasing-and-titles/crown-leases#:~:text=Length%20of%20leases%20A%20residential%20lease%20is%20usually,any%20time%20during%20the%20term%20of%20the%20lease

99 ACT Government, Planning, n.d. *Rural leases*. Available at: https://www.planning.act.gov.au/community/buy/leasing-and-titles/rural-leases

100 ACT Government, Planning, n.d. *Concessional leases*. Available at: https://www.planning.act.gov.au/community/buy/leasing-and-titles/concessional-leases

101 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6*, s 348(2).

Woodlands. Source: EPSDD

Under the *Planning Act 2023*, holders of rural leases are required to enter into a Land Management Agreement with the Territory.[102] However, the term "land management agreement" is only defined as "an agreement with the Territory about managing the rural land described in the lease", and does not include any specific details. Instead, the legislation provides for the Conservator of Flora and Fauna to make guidelines relating to the requirements for Land Management Agreements. There are no current guidelines in place.

While in practice, LMAs may contain a range of provisions regarding management of conservation values, there are challenges relating to assessment of outcomes, and compliance and enforcement matters. Further, the ACT Government is itself a significant lease holder and would be required to have LMAs in place with itself.

4.4 Summary of major policy issues

Despite the significant number of both planning and environmental conservation legislation required to be adhered to in the ACT, there have been significant and ongoing declines in the area and condition of the ACT's threatened ecological communities. Over the period examined in this Investigation, 13 species of plants and animals potentially at risk from development have been added to the threatened species list, or had their level of threat increased, in the ACT. While this has taken place against the backdrop of climate change and natural disasters such as bushfires, it has also occurred while supposedly comprehensive legislative and policy settings have aimed to reduce the impact on the environment. It is clear that this approach is not working.

Ideally, planning and environmental conservation legislation and policies should work in concert, designing projects that lead to good environmental outcomes while also providing Canberrans with the housing, community facilities and other infrastructure that they need. In reality, a complex legislative and operational context makes it challenging to anticipate

102 ACT Government, Planning, n.d. *Rural leases*.
Available at: https://www.planning.act.gov.au/community/buy/leasing-and-titles/rural-leases

potential perverse outcomes and to capitalise on synergies between planning legislation and conservation legislation. An independent policy review undertaken for the Office of the Commissioner for Sustainability and the Environment in 2022 noted "little consideration of the interdependencies among policies, nor of the opportunities or risks associated with inter-related actions".[103]

4.4.1 Environmental governance

Regent Honeyeater. Source: Ryan Colley

As outlined by the review of environmental governance in the ACT,[104] undertaken as part of the 2023 State of the Environment Report, the legislative and administrative arrangements of the ACT's environmental statutory position holders do not establish those roles with sufficient or appropriate independence and accountability.[105] Specifically, the Conservator of Flora and Fauna is a public servant that sits within Environment, Planning and Sustainable Development Directorate, and is appointed by the Director-General of the Directorate.[106] Historically, the same person has occupied the position of the Conservator of Flora and Fauna and of Executive Group Manager of Environment, Heritage and Parks. Consequently, the occupant of this position carries out their functions within the management structure of the Directorate. The Executive Group Manager also reports to the Director-General of the Directorate.

This concern was raised as far back as the 2008 review of the *Nature Conservation Act 1980*, which noted that "The decisions and actions of the Conservator of Flora and Fauna can have an impact on achieving the objectives of the NCA".[107] It also noted a perceived lack of independence of the Conservator.

Following an Inquiry into the Planning Bill 2022 by the Standing Committee on Planning, Transport and City Services,[108] the ACT Government commissioned PEG Consulting to undertake an ACT Planning System Governance Review in 2024.[109] Among their findings were the following (Finding 4):

> *"The dual role arrangement where the powers of the Director-General and Chief Planner reside with the same person results in a significant concentration of responsibility in one individual. These responsibilities are not always compatible."*[110]

103 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, What is Government Doing? Available at: https://www.actsoe2023.com.au/issues/what-is-government-doing/

104 Green Law, 2023. *Final Report: Environmental Governance in the ACT*. Prepared for the Office of the Commissioner for Sustainability and the Environment. Available at: actsoe2023.com.au/wp-content/uploads/2023/10/Environmental-Governance-in-the-ACT.pdf

105 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, Context. Available at: https://www.actsoe2023.com.au/issues/context/#Governance-context-for-this-Report

106 ACT Government, 2024. *Nature Conservation Act 2014 (ACT), Republication No 32*, s 20.

107 Marsden Jacob Associates, 2008. *Enhancing nature conservation policy in the ACT: outcomes from the review of the Nature Conservation Act 1980*. Prepared for the ACT Government.

108 ACT Government, 2022. *Report 12 – Standing Committee on Planning, Transport and City Services – Inquiry into Planning Bill 2022*. Available at: https://www.parliament.act.gov.au/__data/assets/pdf_file/0005/2156792/PTCS-Report-12-Inquiry-into-Planning-Bill-2022-Final-Report-SIGNED2.pdf

109 Peg Consulting, 2024. *ACT Planning System Governance Review – Final Report*. Prepared for the Chief Minister, Treasury and Economic Development Directorate.

110 ibid, p.5.

It then recommended (Recommendation 2):

> *"Separating the role of Chief Planner from the responsibilities of the Director-General, EPSDD would deliver a better governance arrangement."*[111]

On 6 June 2024, the Chief Minister announced that the Government would be appointing a Chief Planner separate from the Director-General of the Environment, Planning and Sustainable Development Directorate, effective from 1 July 2024.[112] It is encouraging that the Government has responded to concerns about governance and transparency, and separated the roles of Chief Planner and Director-General of the Directorate. A similar separation of the position of Conservator of Flora and Fauna from Executive Group Manager of Environment, Heritage and Parks could assist with the transparency of environmental governance in the ACT.

The Review of the Planning Bill 2022 by PEG Consulting also found:

> *"It is not clear where accountability sits for the oversight and monitoring of ecologically sustainable development and how the ambition of the Planning Act will be achieved in this area."*[113]

This issue remains.

New apartments. Source: Richie Southerton

111 ibid, p.6.

112 ACT Legislative Assembly, 2024. *Debates – Weekly Hansard – 6 June 2024*. Available at: https://www.hansard.act.gov.au/hansard/10th-assembly/2024/PDF/20240606.pdf

113 Peg Consulting, 2024. *ACT Planning System Governance Review – Final Report*, p.46. Prepared for the Chief Minister, Treasury and Economic Development Directorate.

Construction near Bluetts Block. Source: OCSE

4.4.2 Planning legislation

Federal considerations

The *National Capital Plan* outlines key objectives relating to the protection *and* improvement of the ACT's natural environment. The *Statement of Planning Principles* within the National Capital Plan provides a clear focus for activities that support the protection of the natural environment. The *National Capital Plan* is binding on the ACT Government, however, without evaluation of the Plan, the degree to which the ACT Government has met the objective is unclear. No federal evaluations of this legislation or strategy have occurred,[114] and there are no enforcement principles in the *National Capital Plan*. This means that while the ACT is required to adhere to the legislation, there is no recourse if the aims are not met, in spite of the declining environmental trends shown in successive ACT State of the Environment reports. This is a notable gap in Commonwealth oversight of the National Capital.

ACT legislation

The ACT has an established history of planning decisions that go against environmental considerations. The 2008 Canberra Plan stated:

> *"The planning landscape in the ACT has altered since 2004, with accelerated greenfield development, the expansion of the Canberra airport and the surrounding commercial space, and proposed residential land releases across the border in New South Wales. In addition, there have been major increases in commercial and residential building activity across Canberra."*[115]

114 National Capital Authority, 2024. FW: Query – evaluations of National Capital Plan. Email correspondence, 21 August 2024.
115 ACT Government, 2008. *The Canberra Plan: Towards Our Second Century*, p.19.

These changes are positioned as having occurred in a vacuum, but many of these "alterations" are the direct results of ACT planning policy and development approvals. It is not clear that the aims of the *Canberra Spatial Plan* ever had a chance of being implemented. Further, the 2008 Canberra Plan included the release of housing and land packages as part of the Government's achievements in the "Sustainable Future" chapter, with no examination of whether this was undertaken in an environmentally sensitive manner.

The *Planning and Development Act 2007*, under which the majority of development under consideration in this Investigation occurred, has now been repealed. Discussion in this section will therefore focus on the *Planning Act 2023* and related policies.

The *Planning Act 2023* is required to "consider cumulative and incremental environmental impacts" as a component of planning and design, as well as ensuring that "planning outcomes should support the operation of the environmental laws applying in the ACT".[116] EPSDD has advised that they are considered as part of any environmental assessment process, including both Environmental Impact Statements and Environmental Significance Opinions. It is however unclear whether a cumulative total of impacts has been calculated. A recent analysis by the ACT Office of Nature Conservation[117] revealed a loss of 129 ha (-1.13 per cent) of mapped Box-Gum Grassy Woodland and 17 ha (-1.49 per cent) of Natural Temperate Grassland (both critically endangered ecological communities) since 2015. The cause of this loss was not part of the analysis.

Lawson. Source: EPSDD

116 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6*, s 10(2).

117 ACT Government, 2024. *ACT Nature Conservation strategy 2013-2023: Progress Against Implementation Plan 2 (2019-23).* p.12. Available at https://www.act.gov.au/__data/assets/pdf_file/0009/2779344/act-nature-conservation-strategy-2013-23-progress-against-implementation-plan-2.pdf

A decision was made in 2023 that there was no need to review the 2018 Planning Strategy[118] according to its five-yearly review schedule. However, given the significant changes in the *Planning Act 2023*, including the District Strategies, it is unclear why a review has not been undertaken or planned. Given the current review of the *Nature Conservation Act 2014*, and the links between conservation and planning, a review of the Planning Strategy should be undertaken in the near future to ensure it aligns with the legislation.

Within the District Strategies[119] there are inconsistent references to infill and its ability to be accomplished in each district, and only one reference to the infill target. While the strategies identify "change areas" for future planning and consultation, they may not result in development across entire sites. If this is the case, it is unclear as to what is the purpose of the categorisation. Using the Belconnen plan[120] as an example, the Category 1 areas (change to happen within zero–five years) include greenfield development in Ginninderry and Lawson South – neither of which are urban infill. It is also unclear what the tolerance is (or not) for development outside of these areas. None of the initiatives to drive the Belconnen District Strategy include a requirement for urban infill.

The Legislative Assembly "Inquiry into the Territory Plan and other associated documents"[121] noted a number of concerns relating to the *Biodiversity Sensitive Urban Design Guide*, including the requirement for developers to identify areas for protection on their land.[122]

The guide does not apply to single dwelling housing or secondary residences, or development where the increase in impermeable surfaces is 500m^2 or less, or where the development is less than 1 ha. It is not clear how the Government's aim of up to 70 per cent urban infill *and* biodiversity sensitive, ecologically sustainable outcomes are able to be met in the context of the Government's support for rezoning of blocks to allow second dwellings, which would be excluded from the requirements of the guide.

The guide does not suggest limiting the use of artificial grass, a known concern in new builds, and can impact on biodiversity and urban heat effects.

118 EPSDD Ref No – fA47737451 – provided 20240809.

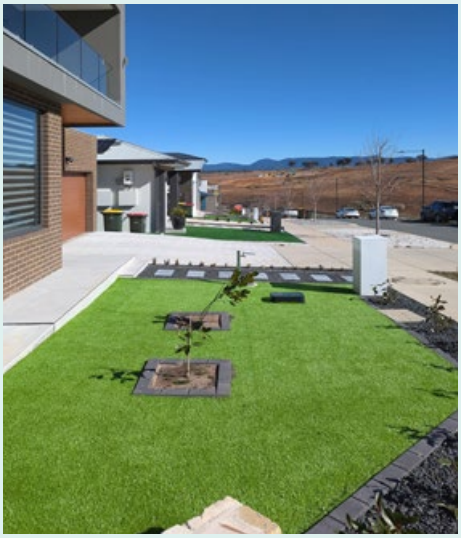
119 ACT Government, Planning, n.d. *District Strategies*. Available at: https://www.planning.act.gov.au/professionals/our-planning-system/district-strategies#district-strategies

120 ACT Government, 2023. *Part One – Belconnen District Strategy*. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0010/2324683/district-strategies-2023-volume-2-district-strategies-belconnen.pdf

121 ACT Government, 2024. *Standing Committee on Planning, Transport and City Services – Inquiry into the Territory Plan and other associated documents*. Available at: https://www.parliament.act.gov.au/__data/assets/pdf_file/0005/2416190/Inquiry-into-the-Territory-Plan-and-other-associated-documents-report-CURRENT-version.pdf

122 Sharp, S., 2023. *Committee Hansard – 7 December 2023*, p.91. Quoted in ACT Government, 2024. Standing Committee on Planning, Transport and City Services – Inquiry into the Territory Plan and other associated documents. Available at: https://www.parliament.act.gov.au/__data/assets/pdf_file/0005/2416190/Inquiry-into-the-Territory-Plan-and-other-associated-documents-report-CURRENT-version.pdf

Artificial turf in the ACT



Artificial turf in Whitlam alongside dark gravel garden beds and white gravel verges.
Source: OCSE

Artificial turf is increasingly prevalent in new builds in the ACT.[123] This is evident in Canberra's newer suburbs. Aerial mapping demonstrates that artificial turf is common in some recent residential developments like Taylor and Whitlam, while it appears far less frequently in older, more established suburbs.

Artificial turf has a range of significant adverse environmental impacts. Artificial turf tends to trap and retain heat, resulting in both direct impacts on users and broader impacts on the community by exacerbating the urban heat island effect. A 2022 NSW independent review reported that on very hot days (with air temperatures of mid-30s or higher), artificial turf can reach maximum surface temperatures of 70-90°C.[124] Artificial turf is also associated with microplastics pollution, reduced biodiversity, greenhouse gas emissions from manufacturing, and increased waste to landfill at end of life.[125,126,127]

ACT Government actions to limit artificial turf in Canberra

The ACT Government has a few schemes to discourage artificial turf in certain parts of Canberra. Whitlam and Jacka have verge bond schemes, where new residents must pay a $1000 bond upon settlement which they only get back if their verge is kept in its original condition during construction.[128] Installing artificial turf on your verge means voluntarily forfeiting your bond. Jacka also has a landscaping rebate for front yards which residents are only eligible for if they don't use artificial turf.[129]

Ginninderry (a joint venture between the ACT Government and Riverview Developments) has gone a step further and implemented schemes to deter artificial turf in front yards (in Strathnairn) and everywhere on the property (in Macnamara).

However, the ACT Government's stance on artificial turf elsewhere is neither strong nor consistent. For example, the *Nature Strip Guidelines* set out what can and can't be installed on residential verges.[130] Synthetic turf is listed in the category of 'approval required', rather than 'unlikely to be approved'. In non-residential settings,

123 Office of the Commissioner for Sustainability and the Environment, 2025. *Fake Grass? Fake News*. Available at: https://storymaps.arcgis.com/stories/b764430af99e4236bcb3e339dd0f5982

124 NSW Chief Scientist & Engineer, 2022. *Independent review into the design, use and impacts of synthetic turf in public open spaces*. Available at: https://www.chiefscientist.nsw.gov.au/independent-reports/synthetic-turf-in-public-spaces

125 De Haan, W., Quintana, R., Vilas, C. et al, 2023. *The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments*. Environmental Pollution, 334(122094).

126 Sánchez-Sotomayor, D., Martín-Higuera, A. Gil-Delgado, J. et al, 2022. *Artificial grass in parks as a potential new threat for urban bird communities*. Bird Conservation International, 33(e16), 1-8.

127 Bø, S. M., Bohne, R. A., and Lohne, J., 2024. *Environmental impacts of artificial turf: a scoping review*. International Journal of Environmental Science and Technology, 21,10205–10216.

128 ACT Government, Suburban Land Agency, n.d. *Rebates and Initiatives*. Available at: https://suburbanland.act.gov.au/home-buyers-and-builders/rebates-and-initiatives

129 ACT Government, Suburban Land Agency, 2024. *Jacka Rebates: Eligibility Guidelines*. Available at: https://www.suburbanland.act.gov.au/docs/default-source/rebates-and-initiatives/jacka-rebate-brochure-2024.pdf?sfvrsn=d7c35d86_3

130 ACT Government, 2019. *Your Nature Strip: Guidelines for Use of Residential Nature Strips*. Available at: https://www.cityservices.act.gov.au/__data/assets/pdf_file/0004/1392088/Nature-Strip-Guidelines-2019.pdf

synthetic surfaces are still being pursued by the Government in some contexts as a water saving measure.[131]

Are schemes deterring artificial turf effective?

The Ginninderry suburb of Strathnairn provides a useful case study to consider the efficacy of schemes discouraging artificial turf use in Canberra. Strathnairn's design guide forbids artificial turf in front yards and states that verges must be turfed with real grass (no artificial turf or gravel).[132] A scheme was established to encourage compliance with the design guide. It consisted of two key elements:

1. New residents had to pay a compliance bond of $5,000 as part of their sales contract.
2. Compliant residents received a free Front Landscaping Package from Riverview Developments.

If residents met all design requirements upon building completion, their bond was returned and they received the front landscaping package.

The outcomes of this scheme were positive but limited. The scheme successfully deterred artificial turf installation out the front of people's properties, where it was explicitly disincentivised. In Strathnairn, less than 5 per cent of blocks have artificial turf in their front yards, and there is no artificial turf on verges.[133]

Backyard in Strathnairn with artificial turf.
Source: LJ Hooker

However, there is still a considerable amount of artificial turf in Strathnairn backyards. Because the scheme only prohibited artificial turf in front yards and verges, residents were still eligible for their bond and free landscaping package if they installed it elsewhere on their property. Many people opted to do this despite being provided information about its negative impacts justifying why it was prohibited out the front.

This seems to show that schemes of this kind work, but there are few flow-on effects in terms of residents voluntarily rejecting artificial turf beyond the scheme's terms. In other words, schemes are only as effective as their scope allows.

In Macnamara – Ginninderry's second suburb, currently under construction – the design guide has been expanded to ban artificial turf everywhere on the property, and the compliance bond has been raised to $7,500-$10,000 depending on block size. So far, compliance has been good.

Moving forward, the ACT Government should ban further installation of artificial turf in all suburbs and set a date for mandatory removal of all currently used residential artificial turf. The ban should be absolute for residential settings, and by exemption following application and approval for commercial and community settings.

131 ACT Government, Transport Canberra and City Services Directorate, 2024. *Urban Open Space Land Management Plan.*

132 Ginninderry, 2022. *Housing Development Requirements – Neighbourhood 1: Strathnairn.* Available at: https://ginninderry.com/wp-content/uploads/2022/07/Ginninderry-Design-Guidelines_July-2022.pdf

133 The scheme's positive impact is particularly evident when comparing Strathnairn to nearby Ginninderra Estate. See Ginninderry, 2025. *Greening Our Streets: The Impact of Landscaping on the Urban Heat Island.* Available at: https://www.youtube.com/watch?v=-KVAvGRetFY&t=67s

The Inquiry into the Planning Bill 2022, undertaken by the Standing Committee on Planning, Transport and City Services, recommended the following (Recommendation 40):

> *The Committee recommends that the ACT Government amend the Bill to include a clearer and stronger definition of "ecologically sustainable development", in line with the common national and international definitions as well as the recommendations set out in the Environmental Defenders Office's submission to the draft Bill.*

The Government Response was:[134]

> *Agreed in Principle*
> *The definition of the term "ecologically sustainable development" in the Bill retains the existing elements of the term "sustainable development" from the Planning and Development Act 2007, while also incorporating contemporary ideas, with inspiration drawn from Section 3(2) of Queensland's Planning Act 2016 and the 2030 United Nations Agenda for Sustainable Development (national and international definitions). The definition has been amended to incorporate reference to the integration of economic considerations rather than achieving economic growth and to enhance the protection of ecological processes and natural systems at local, territory and broader landscape levels to provide consistency with the other ecologically sustainable development principles.*

Given that the ecological systems of the ACT are continuing to deteriorate, it would be hard to say that the goal of "ecologically sustainable development" under the *Planning and Development Act 2007* was achieved. It is therefore disappointing that there was little appetite to change the focus of the term in the new *Planning Act 2023*.

A review of available Environmental Significance Opinions undertaken since 2019 found significant variability between the types of developments qualifying for an Environmental Significance Opinion. A large majority of these are the result of the "works in a reserve" trigger, and consist mainly of work on essential infrastructure by utility companies, and works being undertaken by or on behalf of the ACT Parks and Conservation Service. The majority of these have negligible to no impact on protected species. Most work undertaken by the Parks and Conservation Service under an Environmental Significance Opinion will ultimately benefit biodiversity (e.g. habitat restoration, fencing to manage livestock access) even if there is short-term disturbance.

Mature tree in Taylor. Source: OCSE

Apart from these, Environmental Significance Opinions appear mainly to be triggered where approval is also required under the EPBC Act. These are the developments which result in by far the greatest impact on native habitats and removal of native trees. Rehabilitation of damage and value-add offset plantings are a standard requirement for Environmental Significance Opinions where damage to native ecosystems is unavoidable.

134 ACT Government, 2023. *Standing Committee on Planning, Transport and City Services – Report No. 12 – Inquiry into the Planning Bill 2022 – Government Response*. Available at: https://www.parliament.act.gov.au/__data/assets/pdf_file/0009/2211489/PTCS-12-Inquiry-into-Planning-Bill-2022-Government-Response-tabled-24-April-2023.pdf

Environmental Significance Opinions may be sought when approval has already been provided under the EPBC Act, meaning that proponents do not need to seek duplicate approvals for the same development. However, these are generally developments which result in by far the greatest impact on native habitats and the removal of native trees. Rehabilitation of damage and value-add offset plantings are a standard requirement for Environmental Significance Opinions where damage to native ecosystems is unavoidable.

Long-Billed Corella. Source: Ryan Colley

The review also found that there is little consistency between applications for Environmental Significance Opinions in terms of the information provided. For examples, areas to be impacted by development are sometimes described in square metres (down to very small areas e.g. 2m²) and at other times a less quantifiable descriptor such as "very small" or "not significant" is used.

Similarly, consideration of trees in applications for Environmental Significance Opinions is variable. Some appear only to consider remnant native trees and disregard those which have been planted, even in a naturalised setting, while others consider all trees. The size of a tree which warrants consideration is also variable. Some consider impacts on trees as little as 15 centimetres diameter at breast height, and some do not consider trees with a diameter at breast height of less than 50 centimetres. In still other examples, consideration of trees is based on tree height, not diameter at breast height. This variability appears in the information submitted by the applicants, and appears to be the only information informing the granting of an Environmental Significance Opinion. There are no published guidelines to support standardisation of information in applications for an Environmental Significance Opinion.

A question worth discussion is how the ACT's new right to a healthy environment will interact with the ACT planning system. In their current form, the Planning Act[135] and Territory Plan[136] do not comprehensively address the requirements of the right to a healthy environment. This is most noticeable due to the lack of coverage of specific issues, such as clean water and adequate sanitation, as well as missing information about the implementation of environmental protection and enhancement elements. While these specifics may be more appropriately addressed in different legislation, such as the Nature Conservation Act, the Planning Act has primacy over other environmental legislation.[137] Until this changes, it will be difficult to fully implement principles of the right to a healthy environment and enforce them.

While the Planning Act mentions enhancing, valuing, protecting, and conserving the environment and nature, the environment is only one consideration amongst other needs and priorities addressed in the Act. Historically, planning objectives have had limited outcomes in terms of preserving environmental values, as demonstrated by several

135 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6.*
136 ACT Government, 2024. *Territory Plan 2023 (ACT).*
137 ACT Government, 2024. *Nature Conservation Act 2014 (ACT), Republication No 32.*

consecutive ACT State of the Environment reports.[138] The previous Act, the *Planning and Development Act 2007*, included rigorous environmental considerations *in theory*, including one of the Territory Plan objectives being that policies must "contribute to achieving a healthy environment in the ACT."[139]

For the Right to a Healthy Environment Amendment to make a demonstrable difference to halting environmental decline, major pieces of legislation, such as the Planning Act and Territory Plan, require amendment. Such amendments and mechanisms for environmental protection and conservation then need to be enforced.

The explanatory statement for the Right to a Healthy Environment Amendment states that "incorporating the right to a healthy environment will ensure that environmental and climate impacts are given proper consideration in the exercise of all public authority functions, including in the development of legislation, policy and decision-making."[140] As a result, with the passing of this amendment to the Human Rights Act in the ACT, the right to a healthy environment must be considered in planning at a strategic level. The right should have preventative implications in policy and legislation for environmental harm in the ACT and redress the current trend of environmental decline.

Rural leases

We heard from a number of rural leaseholders, and are aware of numerous media articles, of the concerns around the length of rural leases, as well as the timeliness of communication in order to establish a new lease. One leaseholder told us of a multi-decade period where they were on rolling 3-month leases, and were not able to commit to even minimal changes on the property in case the lease was revoked. Majura Valley leaseholders have raised the issue of a lack of lease since 2005,[141] and the ability for their tenure to be revoked with 90 days notice.[142]

While the ACT Government wrote to farmers with an "intent" to offer 25-year leases[143], lease negotiations have not been finalised.

For some rural landholders, the issues around short lease length negatively impacts their sense of agency to implement conservation measures on their properties, because there is no guarantee their efforts and investments will be preserved or sustained. Longer leases would better empower landholders to carry out their desired stewardship role.

Land Management Agreements (LMAs) are under the Planning Act, but can involve conservation activities and are administered by the Conservator.[144] Issues around rural lands are discussed in further detail in Chapter 8.

138 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, Canberra's Urban Boundary. Available at: https://www.actsoe2023.com.au/issues/canberras-urban-boundary/

139 ACT Government, 2023. *Planning and Development Act 2007 (ACT), Republication No 109.*

140 ACT Government, 2024. *Human Rights (Healthy Environment) Amendment Bill 2023 – Explanatory Statement.*

141 Doherty, M., 2024. *'My heart's racing': Majura Valley farmers offered 25-year leases 'in-principle'*. The Canberra Times, published on 16 August 2024. Available at: https://www.canberratimes.com.au/story/8732671/majura-valley-farmers-offered-25-year-lease-with-no-withdrawal/

142 Doherty, M., 2024. *'This government breaks promises': Majura valley farmers ramp up fight for lease*. The Canberra Times, published on 15 August 2024. Available at: https://www.canberratimes.com.au/story/8730159/majura-valley-farmers-20-year-wait-for-lease-renewal/

143 Doherty, M., 2024. *Beware the fine print: Majura Valley farmers not happy with lease details*. The Canberra Times, published on 2 September 2022. Available at: https://www.canberratimes.com.au/story/8747932/act-farmers-critical-of-25-year-lease-terms/

144 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6*, Chapter 10.

Majura Valley Farm. Source: OCSE

4.4.3 Conservation and biodiversity legislation

Federal considerations

The Samuel Review of the EPBC Act (2020) provided a stark assessment of the efficacy of the EPBC Act, noting that it "does not facilitate the restoration of the environment. The current settings cannot halt the trajectory of environmental decline, let alone reverse it."[145] Specifically, and applicable to this Investigation, the review noted:

> *"Cumulative impacts on and threats to the environment are often not well managed under the current settings. Assessment and approval decisions are largely made on a project-by-project basis, with the assessment of impacts largely done in isolation of other current or anticipated projects. This approach underestimates the broadscale cumulative impacts that development can have on a species, ecosystem or region. Each individual development may have minimal impact on the national environment, but their combined impact can result in significant long-term damage."*[146]

The Samuel Review noted that there are overlaps between state and federal legislation, and that environmental offsets are poorly designed and implemented.

The Samuel Review also found that:

> *"Surveillance, compliance and enforcement under the EPBC Act is ineffective. There has been limited enforcement of the Act over the 20 years it has been in effect, and the transparency of what has been done is also limited."*[147]

The Review recommended improved data collection, modern regulatory surveillance, compliance and enforcement powers, and an increase in transparency and accountability of activities.

145 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report*. Prepared for the Department of Agriculture, Water and the Environment, p.17.
146 ibid, p.44.
147 ibid, p.147.

Offsets

As per the federal offset policy, offsets must "deliver an overall conservation outcome that *improves* or *maintains* the viability of the protected matter as compared to what is likely to have occurred under the status quo, that is if neither the action nor the offset had taken place".[148] With regard to legal protection, the offset policy states "As a general guide, the best legal mechanisms for protecting land are intended to be permanent (lasting forever) and are secure (that is, they are difficult to change or alter).[149]. However, most offsets are only required to be maintained for the period of the impact of the project, which can differ between approvals. This is at odds with the ACT Environmental Offsets Policy which states offsets "are generally required to be put in place for the duration of the impact. For urban development, this essentially requires offsets to be delivered in perpetuity."[150]

Despite this, the Samuel Review of the EPBC Act, as well as the federal government's Nature Positive Plan, notes that current offset arrangements are contributing to environmental decline. In 2024, the Australian Conservation Foundation's investigation of 218 offset sites found that 21 per cent of sites were not protected, more than two thirds of all cases were not tied to any legal obligation for the approval holder to adequately protect the offset site, and 36 per cent of cases did not require the approval holder to report on their progress in protecting their offset site.[151]

The Williamsdale offset site. Source: OCSE

148 Australian Government, Department of Sustainability, Environment, Water, Population and Communities, 2012. *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*, p.17. Available at: https://www.dcceew.gov.au/sites/default/files/documents/offsets-policy_2.pdf

149 ibid, p.18.

150 ACT Government, Environment and Planning Directorate, 2015. *ACT Environmental Offsets Policy*, p.7. Available at: https://www.act.gov.au/__data/assets/pdf_file/0010/2624446/act-environmental-offsets-policy-2015.pdf

151 Australian Conservation Foundation, 2024. *Set and forget: How offsets under national environmental law drive habitat destruction*, p.4.

The Samuel Review noted that "environmental offsets have become the default, rather than the exception after all practical options to avoid or mitigate impacts have been exhausted".[152] It states, "some proponents see offsets as something to be negotiated from the outset, rather than making a commitment to fulsome exploration (and exhaustion) of options to avoid or mitigate impacts. Conditions of approval most often require proponents to protect areas of habitat similar to the area that has been destroyed or damaged by the project, but compliance and enforcement of these conditions is ineffective."[153]

In the ACT, offsets have been required for 26 one-off approvals granted under the EPBC Act for actions proposed in the ACT, and all but one proceeded; as such, there are 25 existing offsets required for projects in the ACT. Seven of these offsets were implemented as funding for threat abatement and research. Where land was required to be protected (18 cases) offset protection outcomes were:

- adequate in 11 cases (61 per cent)
- inadequate in four cases (22 per cent) – two because no mechanism was specified by which the offset site was to be protected and two because the protection mechanism required, Land Management Agreements, are themselves inadequate protection
- unknown in two cases (11 per cent) where the location of the offset site (if any) remains unknown, and
- non-existent in one case (6 per cent) where it is clear no protection has been delivered.

In two cases where the protection is inadequate, no mechanism was specified by which the protection of the offset site was to be achieved.

Some ACT Government commitments have been made to incorporate *some* offset sites that are not already nature reserves in the Canberra Nature Park at the expiry of the one-off or strategic approvals to which they relate. For example, the ACT Government website for the Jacka, Taylor and Horse Park North offset sites in the Gungahlin District states these areas will be added to Canberra Nature Park when the Gungahlin Approval expires on 1 Jan 2043.[154]

These commitments, while welcome, are not backed by any legal requirement. This means the sites are potentially vulnerable to loss if a future ACT Government was to change its position on the protection of these sites. The sites are not protected to the same degree as nature reserves.

ACT considerations

Lack of primacy of nature conservation legislation

In the main, and as demonstrated above, the *Nature Conservation Act 2014* cannot be said to have achieved its objectives in the past decade given the continued increase in the number of threatened species and communities, loss of native habitat, and loss of mature native trees in the ACT. This is however largely a result of the fact that the *Nature Conservation Act 2014* is by no means the only piece of legislation in the ACT which has an impact on biodiversity conservation. The 2023 ACT State of the Environment Report identified 30 Acts on the ACT Legislation Register which may have a bearing on

152 Samuel, G., 2020. *Independent Review of the EPBC Act – Final Report*. Prepared for the Department of Agriculture, Water and the Environment, p.39.

153 ibid, p.19.

154 ACT Government, n.d. *Environmental Offsets*. Available at: https://www.act.gov.au/environment/parks-and-conservation/conservation/environmental-offsets

Woodstock Nature Reserve. Source: Richie Southerton

the environment and sustainability,[155] and consequently have the potential to work against the objects of the *Nature Conservation Act 2014*.

Broader factors, especially climate change, have also limited the capacity of the *Nature Conservation Act 2014* to achieve its objectives.

The *Nature Conservation Act 2014* sets out clear penalties for individuals killing, taking, keeping, selling or importing and exporting native animals, plants or fish, or damaging reserved areas, but excludes soil conservation. However, Division 6.1.4 of the *Nature Conservation Act 2014* allows an exception to an offence if the person is authorised to engage in the conduct constituting the offence under a licence under the *Planning Act 2023*.[156]

The issues posed by the creation of protected areas under the *Planning Act 2023*, and not the *Nature Conservation Act 2014*, have been frequently raised by a range of stakeholders. The *Planning Act 2023* requires the Conservator of Flora and Fauna to recommend changes to *Territory Plan 2023* to make a reserve.[157] However, the final decision is made by the Chief Planner.[158] Allowing the Conservator's recommendation to directly enact a change to the Territory Plan would ensure reserves are declared as a result of conservation advice, without a planning lens taking primacy.

While the *Planning Act 2023* makes provisions for the Conservator of Flora and Fauna to provide input into decisions relating to reserves, the current administrative arrangements where the Conservator of Flora and Fauna sits within the structure of the Environment, Planning and Sustainable Development Directorate and reports to the Director-General EPSDD (who, until recently, also held the position of Chief Planner) means that decision-making in relation to such matters is opaque. Moving the authority for the designation of reserves and ecological management plans into the *Nature Conservation Act 2014* would send a strong signal on the importance of conservation for these areas.

Protected area management

The ACT has an impressive reserve network with over 60 per cent of its land area in reserves of some kind. However, while reserved lands are likely to play a critical role in nature conservation in the ACT, the 2023 ACT State of the Environment Report found that the ecological condition of most reserves in the ACT is unknown. It is therefore not possible to determine how effective the reserve network is in fulfilling its conservation objectives.

In the ACT, a number of legislative and practical aspects of reserve management make it challenging for threats to the natural values of protected areas to be managed effectively. Perhaps most significantly, the *Nature Conservation Act 2014* does not have "primacy"

155 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, Context. Available at: https://www.actsoe2023.com.au/issues/context/#Governance-context-for-this-Report
156 ACT Government, 2024. *Nature Conservation Act 2014 (ACT), Republication No 32*, s 153(2)(b)(iii).
157 ACT Government, 2024. *Planning Act 2023 (ACT), Republication No 6*, s 384(2).
158 ibid, Chapter 3.

in reserves, which is a crucial requirement for the long-term protection and preservation of reserved areas. Primacy in the interests of conservation should require that the relevant park management Act serves to exclude other potentially conflicting legislation in reserves, or that the other legislation excludes itself from reserves. In the ACT several important aspects of land management including fire management, littering and dumping, domestic animal management (including animal/carer behaviour) and erection of structures are covered by a range of legislation that cannot be enforced by Parks and Conservation Service staff. This means that offences in these categories are generally not pursued in reserves, which, perversely, is where they should be most actively pursued in the interests of conservation.

Goorooyaroo Nature Reserve. Source: Mark Jekabsons

Current knowledge gaps make it challenging to assess if conservation reserves are effectively protecting ecosystems and biodiversity. The ACT lacks comprehensive information on land health and the condition of conservation areas, which hinders a full understanding of environmental trends.[159]

Monitoring

The Conservation Effectiveness Monitoring Program is the tool developed by ACT Government to assess the efficacy of its conservation efforts. The program distinguishes between "target" and "reference" conditions as benchmarks for assessing ecosystem health within the ACT reserve system.[160] Reference condition represents an ideal or "natural" state of an ecosystem before substantial human disturbance, while target condition is a more achievable management goal that considers current limitations and resource feasibility. Target conditions often account for practical constraints, like irreversible land use changes or persistent invasive species, which make returning to a pristine state difficult. Assessments of selected ecosystems under the Conservation Effectiveness Monitoring Program reveal mixed results:

- Lowland woodlands within ACT reserves remain in "good condition with concerns," while offset sites are classified as "moderate" but show signs of improvement (ACT Office of Nature Conservation, pers. comm., 2024). However, there has been no systematic condition monitoring for lowland forests to date.
- Lowland natural temperate grasslands are in "poor" condition against reference but rated "moderate" or "good with some concerns" against targets.
- Aquatic and riparian ecosystems are in "poor" condition against unmodified reference states but "moderate" against current targets.

159 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report.*

160 ACT Government, Environment, Planning and Sustainable Development Directorate, 2017. *Conservation Effectiveness Monitoring Program: An Overview*. Available at: www.act.gov.au/__data/assets/pdf_file/0004/2539624/conservation-effectiveness-monitoring-program-overview-2017.pdf

All ecosystems show significant gaps in data, particularly regarding invasive species. Assessments highlight a consistent disparity between achieving a "good" rating against target conditions versus a "poor" rating against ideal reference states. Poor condition against reference conditions indicates that, despite functional improvements, the original species composition and biodiversity levels are not fully restored. Issues like invasive species, altered habitat structure, and discontinuation of traditional Ngunnawal land stewardship practices, continue to prevent a return to pre-European ecological states, revealing a gap between ideal and practically attainable ecosystem health.

Thus, while ecosystems may regain functional resilience and basic ecological stability (achieving target conditions), they still fall short of the complex, native biodiversity typical of reference conditions.

Further, ecological monitoring of offsets in the ACT is inconsistent, with each site having a varying number of reports on the state of the offset location, and with very few recent reports. This deficiency in reporting contributes to the lack of understanding of the condition of land in the ACT.

A lack of resourcing compounds these issues. In the 2023-24 and 2024-25 ACT Budgets, only three per cent of total spending was allocated to the environment, sustainable development and climate change.[161,162] This is the lowest proportion of budget allocation to any of the 11 identified areas, apart from one, and the proportion of this funding that goes to biodiversity conservation is only a fraction of one per cent of the total ACT Budget. It is therefore hard to take the view that biodiversity protection is a genuine priority for the ACT. Additional allocation of funding in the ACT Government Budget would help to properly protect nature, along with significant reform in the next iteration of the Nature Conservation Act (under development).

The Pinnacle Nature Reserve. Source: OCSE

161 ACT Government, n.d. *Budget 2023-24 – Where our money goes*.
Available at: https://www.treasury.act.gov.au/budget/budget-2023-24/budget-2023-24/where-our-money-goes

162 ACT Government, n.d. *Budget 2024-25 – Where our money goes*.
Available at: https://www.treasury.act.gov.au/budget/budget-2024-25/budget-papers/where-our-money-goes

5

Environmental impacts of development

Development in Whitlam. Source: Richie Southerton

5. Environmental impacts of development

5.1 Introduction

The negative impacts of greenfield developments on biodiversity and ecosystem function are well documented and widely accepted. Almost 30 years ago (in 1997), the ACT State of the Environment Report[1] identified that woodlands and grasslands and their dependent species have suffered most from urban development, and that such development now constitutes a serious threat to their existence, regardless of how slow the urban spread might be. The 2023 ACT State of the Environment Report[2] highlighted that urban expansion across the ACT has had considerable and increasing environmental impacts, with habitat loss and degradation being the primary threat to species in the Territory.

The 2023 Report also highlighted an absence of reliable information and analysis on the relationship between urban expansion and species decline. While the general effects of greenfield development are clear, they can be hard to quantify. This is due to lack of data (either because the information has not been collected or because it is collected in a way which is inconsistent or insufficiently robust) and the difficulty of accounting for other factors which broadly affect environmental condition, such as drought and bushfires. Successive ACT State of the Environment reports have not been able to establish whether the reserve system is in good condition, let alone the condition of areas which are not actively managed and protected by the ACT Government.

This chapter seeks to evaluate the impacts of urban development in the ACT on ecological communities, threatened species and environmental conditions over the past two decades. It also assesses potential future impacts on biodiversity and greenhouse gas emissions. This assessment was conducted by independent external consultants using publicly available data from a range of sources. Details of the methodologies employed for the various components of this impact assessment are available in the full assessment report.[3]

It should be noted that while this section goes some way to filling the information gaps on this topic, the exact impacts of specific land use changes on individual species remain under-researched. In particular, the cumulative effects of habitat fragmentation on the long-term viability of native species are poorly understood. While urban greenspaces are acknowledged for their potential conservation value, there are limited data on their effectiveness in mitigating the impacts of urban expansion. Addressing these gaps requires long-term, focussed monitoring and analysis to track how urban expansion and climate shifts together impact the ACT's ecological resilience.

1 Office of the Commissioner for Sustainability and the Environment, 1997. *Australian Capital Territory 1997 State of the Environment Report*.

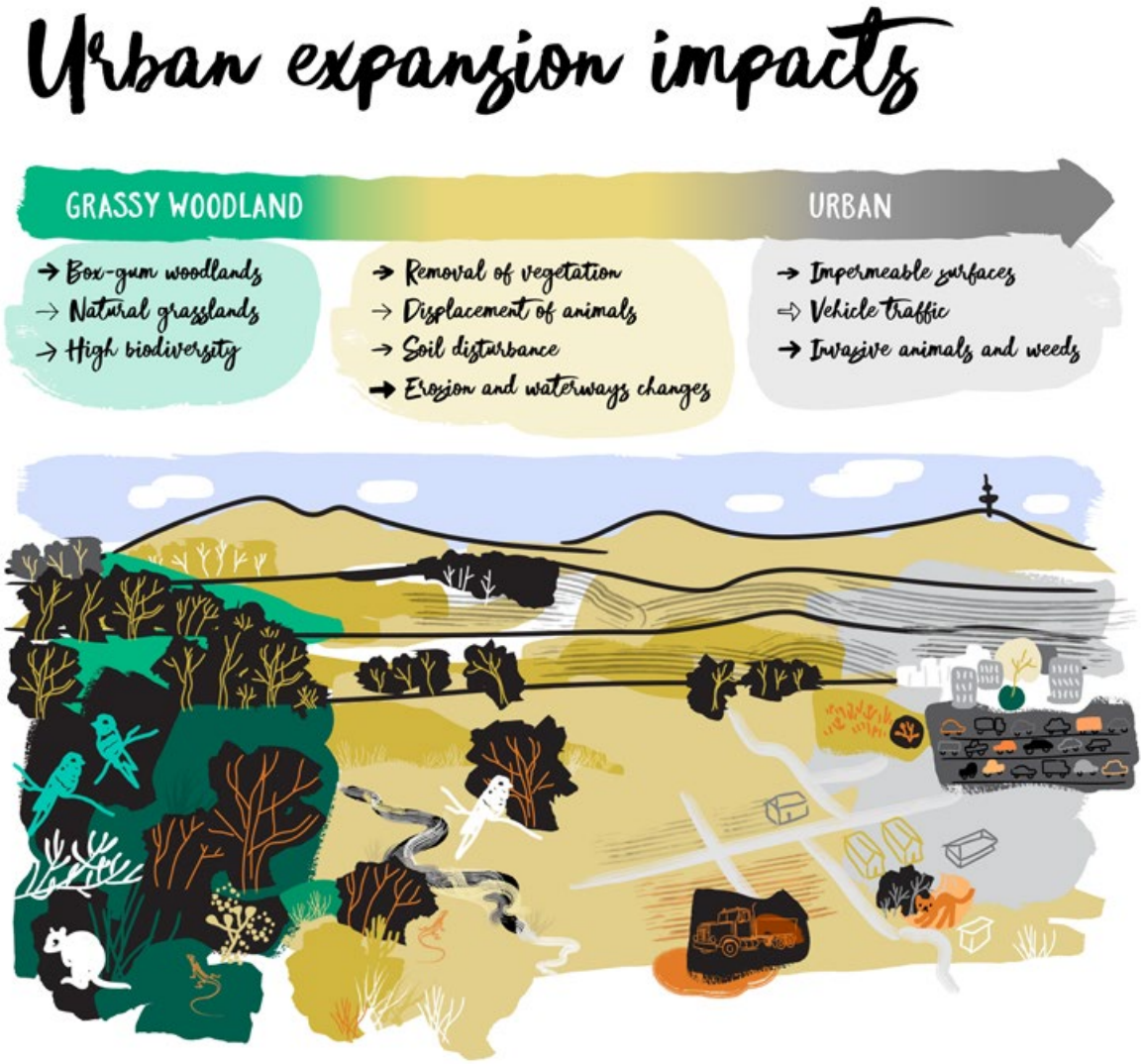
2 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*.

3 Van Dijk, A., Rapley, S, Chen, M., et al, 2025. *Analysis of land use change and biodiversity trends in the ACT*. Prepared for the Office of the Commissioner for Sustainability and the Environment. Available at: https://envcomm.act.gov.au/analysis-of-land-use-change-and-biodiversity-trends-in-the-act

5.1.1 Background to greenfield development impacts

Greenfield development is development which takes place on land which was not previously part of the urban area, such as farmland or bush. Greenfield developments increase the size of the town or city where they are built. In the ACT, Canberra's urban footprint is continuing to expand in the north and west with several greenfield developments in the Molonglo Valley (Whitlam and Denman Prospect – see Chapter 7. Canberra's western greenfield developments); Gungahlin (Taylor, Throsby, Jacka and Moncrieff); and West Belconnen (Ginninderry).

Even where developments take steps to embed sustainable principles into the design of a suburb, from the household to the district level, the adverse impacts on the local environment persist. Clearance of habitat, disturbance of ecological communities, and increased urban edge effects are not mitigated by solar panels and insulation. This is unfortunately the case even when greenfield developments are planned with sustainability in mind and statutory processes have been adhered to.



Conversion of land from any natural, semi-natural or rural state into urban development typically results in adverse environmental impacts. These include:

- soil disturbance and displacement
- erosion and sediment mobilisation
- changes to water courses and hydrology
- killing of invertebrates and small vertebrates during land clearing
- permanent displacement of native animals and plants from the area
- increase in vehicle traffic
- increase in impermeable surfaces
- localised increase in temperature
- increased human and domestic animal presence
- increase in non-native plants, including weeds
- increase in invasive animals (both native and non-native), and
- increase in light and noise pollution.

Greenfield developments can have both direct and indirect effects on threatened species populations, impacting habitat and species survival. Urban expansion also affects water quality and has implications for greenhouse gas emissions.

Key impacts are explored in more detail below.

Direct habitat loss and degradation

Greenfield development involves direct land use change resulting in the destruction, degradation or conversion of existing habitat. This can include the destruction of critically endangered ecosystems, such as Box-Gum Grassy Woodland and Natural Temperate Grassland, along with their associated habitats and structures, such as mature trees and hollows. This destruction can result in direct mortality for flora and fauna or indirect mortality, as animals disperse and are vulnerable to predation or competition from invasive species or unable to find new suitable habitat within the distance they can travel.

Mature tree loss

In the ACT, an important feature of the landscapes being developed is mature eucalypts. These "keystone structures" provide critical resources that many native species, particularly birds, depend on for survival. In order to make way for new suburbs, many mature trees are cleared during development and the services they provide cannot be adequately recovered by replacing them with younger trees. Loss of mature native trees has been declared a key threatening process under the *ACT Nature Conservation Act 2014*, and an Action Plan to Prevent the Loss of Mature Native Trees was launched in late 2023.

Despite stated efforts to retain mature trees within the development, Whitlam was listed as one of the areas experiencing the largest percentage of mature tree loss per suburb in the ACT between 2015 and 2020, alongside Coombs, Throsby, Taylor and Wright. This was identified through a LiDAR analysis[4] conducted for the *Action Plan to Prevent the Loss of Mature Native Trees*, which found that the ACT has lost 6.2 per cent of its mature urban native trees between 2015 and 2020, primarily due to land clearing for new urban development. Work undertaken for this report found that the largest reductions in tree crown cover between 2004 and 2023 were recorded in Strathnairn (-3 ha) and Hall (-1 ha).

4 Botha, J. H., 2021. *Using LiDAR to map mature tree loss across the ACT 2015–2020 – Technical Report*. Prepared for the Environment, Planning and Sustainable Development Directorate.

Owlet Nightjar in a tree hollow. Source: OCSE

Connectivity

When natural landscapes are replaced by human settlements, the type, quality and connectedness of habitat in that area, even beyond the development footprint, is permanently altered. This can lead to significant changes in the abundance and distribution of native species.

Greenfield development fragments habitat. Connectivity is essential for ecological processes such as migration, gene flow and repopulation where species have become locally threatened or extinct, resulting in decreased genetic diversity in isolated populations. This loss of genetic diversity decreases a species' ability to adapt to changing conditions and, therefore, their overall resilience. When landscapes are divided into isolated or poorly linked patches, species are also less able to adapt to pressures by moving in response to environmental change, and acute physical barriers like roads prevent and alter species movement across the landscape. More roads and vehicles also increase the likelihood that animals will be killed while attempting to cross. Furthermore, as overall patch size becomes reduced and corresponding edge length of the patch increases, habitats are at higher risk of external disturbance, exacerbating the edge effects described below.

Loss of connectivity is a concern in aquatic as well as terrestrial settings. Aquatic connectivity can be lost through poor infrastructure design, extraction of water and poor quality water. Consequences can include loss of aquatic species and/or the supporting habitat and water they need to survive, declining genetic condition of populations and general poor health of aquatic species.

Edge effects

Beyond the urban area itself, greenfield developments also negatively impact biodiversity through a range of "edge effects". For example, plants and animals that commonly occur in urban settings can encroach upon adjacent habitat and then predate, displace or dominate local native species. These range from aggressive birds to backyard weeds and unrestrained pets like cats and dogs. In principle, domestic cats can be managed

Cats kill large numbers of native animals. Source: Akira B

through enforced cat containment laws to mitigate their impact on local wildlife, but in practice, this may not always be effective. Urban areas can also facilitate increased vertebrate pests like foxes, which are attracted by human refuse.

Proximity to urban areas can also increase recreation pressure on natural habitats. For example, people living closer to natural rivers may increase the fishing pressure on naturally breeding native fish populations, and increased foot traffic disturbs sensitive animals, especially during breeding.

Another edge effect comes from light and noise pollution, which can produce changes in animal behaviour, increase risk of predation and reduce reproductive success. The urban heat island effect can also impact biodiversity on the urban fringe, for example, by increasing numbers of heat-tolerant invasive species.

Edge effects may be augmented by the establishment of Asset Protection Zones around suburbs adjacent to bushland. While these are important for mitigating bushfire risk to urban areas, the simplification of vegetation structure within such zones for fuel management can have negative impacts on wildlife. Encouragingly, this impact is now recognised:

> *A fundamental premise for APZs in new developments built after 2022, is that they are provided within the development footprint, ensuring they are cost effective to manage, and that the owner or land manager will be able to maintain the area in perpetuity. The APZ should be able to be managed in a manner which is considerate of the environmental values present at the site.*

Even development on "low environmental value" greenspace such as improved pasture lands can impact native ecosystems as it moves the urban area closer to more intact natural habitat, making it susceptible to edge effects.

For this Investigation, OCSE reviewed Environmental Significance Opinions issued for developments in the ACT since 2019. We found that vegetation communities being already disturbed or degraded may be used as justification for development being permitted. An increase in the length of Canberra's urban edge could result in more areas outside the city that are more likely to be deemed "developable" in future as their environmental values are gradually eroded by edge effects.

Waterway health

Greenfield development also has important implications for waterway health. Simply changing an area of land from natural use to urban use will have a negative impact on water quality.

By replacing rural or natural landscapes with impermeable surfaces, urbanisation typically leads to increased pollution and runoff, and increased river turbidity. These changes can disrupt aquatic ecosystems, affecting sensitive aquatic macroinvertebrate communities and causing cascading effects through food webs, impacting fish species, causing algal blooms and deteriorating vegetation health.

Urban stormwater in Denman Prospect. Source: OCSE

Greenhouse gas emissions

Greenfield development leads to increased emissions from construction (due to the need to establish new large-scale infrastructure such as roads, sewerage and stormwater) and transportation (with greenfield suburbs typically having a higher reliance on private vehicles). Urban development also has implications for carbon loss through the removal of vegetation.

5.2 Land cover change and vegetation condition in urban Canberra 2004–2023

Past urban development has transformed land use in the ACT, significantly affecting natural habitats and ecological communities. This section quantifies and maps land use changes to understand urban expansion and vegetation loss between 2004 and 2023. Machine learning models were used to interrogate high-resolution airborne imagery and LiDAR data to map and quantify urban growth, bare soil, vegetation loss, and changes in vegetation structure and condition. More detail about the methodology and limitations of this study can be found in the full impact assessment report.[5]

Remote sensing tools provide valuable insights into certain vegetation metrics, such as leaf cover, greenness and soil protection but cannot capture all aspects of ecosystem health. Increased vegetation cover and biomass, as observed through remote sensing, likely point at improvements in general ecosystem function, such as soil stability and water retention. However, while satellite data may indicate stable or even improving vegetation cover it can miss subtler signs of ecological degradation, such as shifts in species composition from native to invasive species or the loss of biodiversity within the ecosystem. Similarly, structural changes in vegetation, such as the decline of mature trees, loss of understorey diversity or reduction in habitat complexity, are difficult or impossible to detect from satellite imagery alone.

5 Van Dijk, A., Rapley, S, Chen, M., et al, 2025. *Analysis of land use change and biodiversity trends in the ACT*. Prepared for the Office of the Commissioner for Sustainability and the Environment. Available at: https://envcomm.act.gov.au/analysis-of-land-use-change-and-biodiversity-trends-in-the-act

Consequently, complementary ground-based assessments remain essential to accurately assess ecosystem integrity and identify conservation needs beyond what satellite data can provide.

Key findings include:

- The ACT's building footprint[6] grew by 40 per cent between 2004 and 2023, driven mainly by greenfield developments. In areas already mapped as urban in the 2018 ACT Vegetation Map, the building footprint expanded by only 1.5 per cent between 2015 and 2023, indicating that most new buildings were in greenfield developments rather than infill.
- Vegetation density increased between 2004 and 2023. However, this trend appears weaker in urban developed areas than in urban open spaces and reserves.
- Urban Open Spaces saw consistent increases in ground cover between 2004 and 2023, while tree crown was mostly stable and building footprints within these areas remained minimal.
- Vegetation condition in the ACT generally improved between 2004 and 2023, largely driven by initially dry trending to wet conditions and general recovery from the 2003 bushfires.
- Water availability is the primary driver of vegetation condition. This is reflected in satellite-observed vegetation indicators.
- Urban developments led to some of the most notable losses in vegetation cover in suburbs in new Gungahlin, Molonglo Valley and Jerrabomberra, with reductions in vegetation cover exceeding 20 per cent in some areas.
- Despite urban expansion pressures, Box-Gum Grassy Woodland and Natural Temperate Grassland in undeveloped areas along the northern and western edges showed positive trends in vegetation condition indicators.

Aerial view of Denman Prospect. Source: EPSDD

6 Note this is not the same as urban area, but specifically refers to the area occupied by buildings.

5.2.1 Land cover change within the urban footprint

The 2018 ACT Vegetation Map[7] recognises several land use types within the urban footprint.[8] The two considered here are Urban and Developed Areas (26,416 ha) and Urban Open Spaces (2,299 ha). Except for two rural villages (Uriarra Village and Tharwa), land cover mapping was conducted for their full extent.

Within Urban and Developed Areas, several counteracting trends can be observed (see Figure 5.1):

- There was a significant increase (40 per cent) in the building footprint, from 3,075 ha in 2004 to 4,314 ha in 2023. However, the increase between 2015 (the approximate year of the vegetation mapping) and 2023 was only 1.5 per cent. Such a small increase in urban areas compared with a large increase overall indicates that most new buildings were in greenfield developments rather than infill.
- There was a decrease in tree crown[9] cover until 2015, followed by a slight increase thereafter. The decline up to 2015 is likely due to land clearing for new developments, while the subsequent increase aligns with the overall rise in tree cover across the ACT, most likely due to favourable climatic conditions.
- There was a reduction in unvegetated areas and an increase in low vegetation cover after 2015. These changes reflect development prior to 2015, followed by vegetation growth, including in newly created green strips, gardens, and open green spaces.

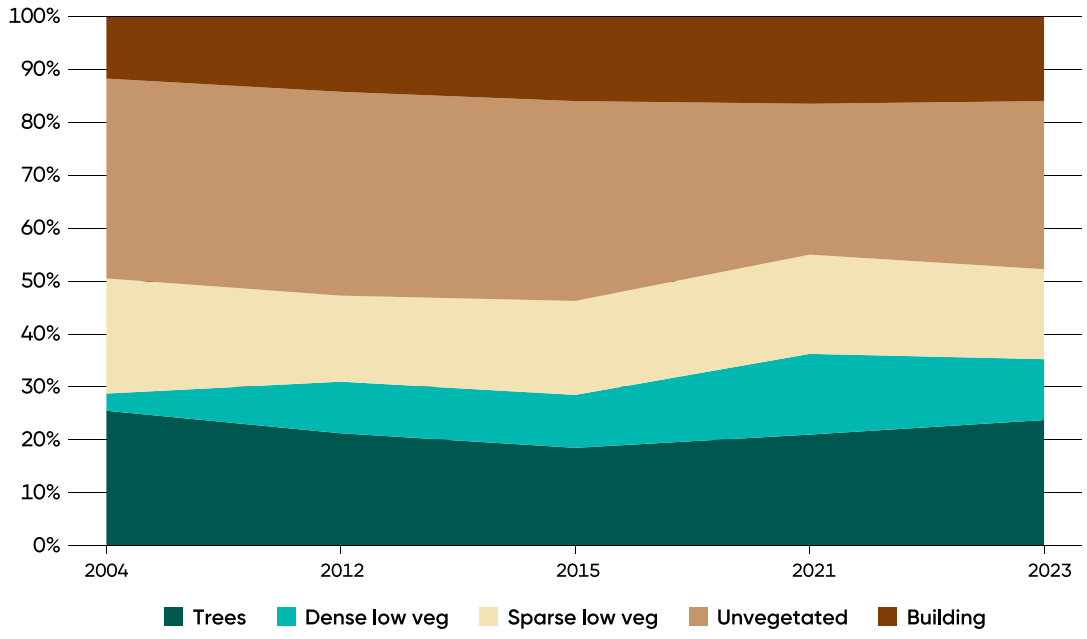


Figure 5.1. Percentage cover of vegetation types, unvegetated areas, and buildings in the ACT's Urban and Developed areas, 2004–2023.
Source: Haizea Analytics

7 ACT Government, 2018. *ACTGOV Vegetation Map 2018*.
Available at: https://www.arcgis.com/apps/mapviewer/index.html?layers=7ec1ec92a0254fd087d1998db41e0b3b

8 This report defines urbanised areas as any 1 ha area of which more than 10 per cent is covered by buildings. This definition was chosen to avoid identifying isolated rural buildings and agricultural sheds as urban areas and is in line with commonly used definitions in similar applications. For example, see Hahs, A. and McDonnell, M., 2006. *Selecting independent measures to quantify Melbourne's urban–rural gradient*. Landscape and Urban Planning, 78(4), 435–448.

9 There is a difference between tree crown vs. canopy cover, in that the former also includes gaps within the crown, whereas the latter does not. Therefore, crown cover is always greater than canopy cover.

For Urban Open Spaces, there was an overall increase in ground cover from 2004 to 2023, while tree cover declined slightly before 2015. The explanations for these changes are similar to those observed in Urban and Developed Areas. A notable exception is the very small area of buildings within Urban Open Spaces, which increased by 19 per cent over the period (see Figure 5.2).

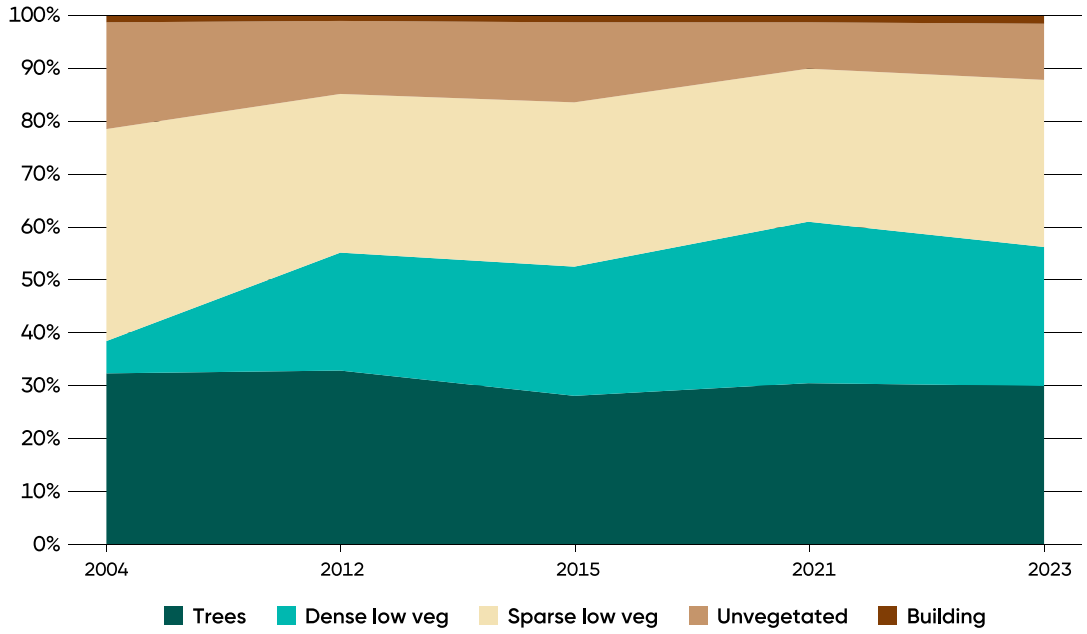


Figure 5.2. Percentage cover of vegetation types, unvegetated areas, and buildings in the ACT's Urban Open Spaces, 2004–2023.
Source: Haizea Analytics

Overall land cover changes across the entire ACT (see Figure 5.3) show an increase in the area of buildings from 3,096 ha in 2004 to 4,366 ha in 2023 (+41 per cent). However, this did not result in an overall decrease in vegetation cover, which actually increased by 11 per cent over the same period. This gain was due largely to an increase in dense low vegetation, while tree crown cover remained nearly stable (-one per cent).

This suggests that most new urban development occurred on land that was already cleared or in poor condition (most likely due to drought), and therefore partially or fully unvegetated. While this does not imply that urban development did not lead to any loss of native vegetation, the impact on vegetative cover was largely offset by gains elsewhere.

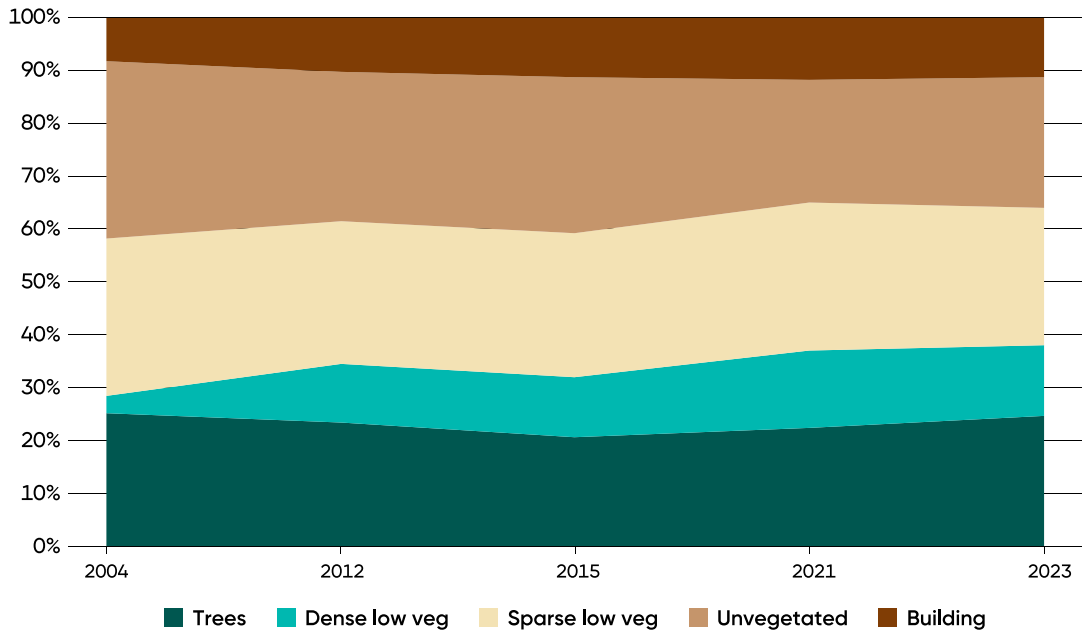


Figure 5.3. Percentage cover of vegetation types, unvegetated areas, and buildings across the ACT's urban area, 2004–2023.
Source: Haizea Analytics

Fire, drought and flooding rain

During the study period for this report, south-eastern Australia experienced both the Millennium Drought from 2001–2009, and two of the top-10 highest rainfall years since records began[10] between 2010 and 2020. In 2003, parts of the ACT were decimated by unprecedented wildfires which encroached into urban areas along the west of Canberra. At the macro level, vegetation changes captured in this report are therefore attributable mainly to environmental factors (albeit ones largely driven by anthropogenic climate change) rather than direct development pressures.

Figure 5.4 shows a snapshot of woody cover in four sample areas in Canberra. This represents a very small sample size and cannot be viewed as representative of broader trends. A similar comparison of a larger number of sites could be valuable, however. The trends shown in this graph suggest that natural areas may have greater capacity to regenerate during favourable weather conditions than modified lands.

The sites were selected at random to illustrate different types of land use in the ACT and are as follows:

- Red Hill Nature Reserve – established nature reserve
- Curtin – established residential suburb
- Molonglo – rural grazing land with no development during the study period, and
- Taylor – rural grazing with development of residential suburb undertaken during the study period.

10 Australian Government, Bureau of Meteorology, 2025. *Australian climate variability & change – Time series graphs*. Available at: http://www.bom.gov.au/cgi-bin/climate/change/timeseries.cgi?graph=rain&area=seaus&season=0112&ave_yr=0&ave_period=6190

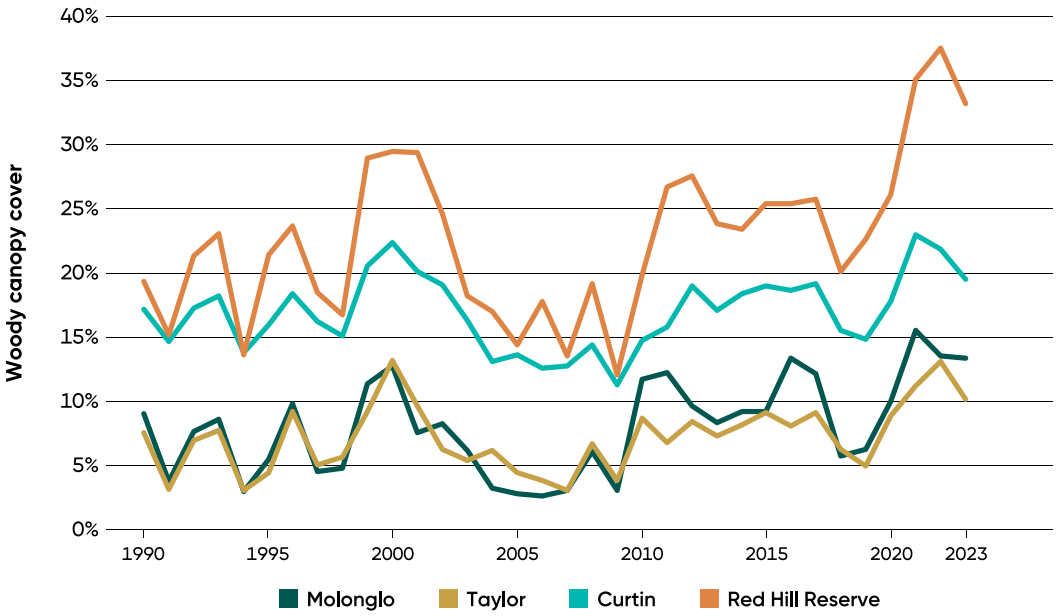


Figure 5.4. Changes in the percentage of woody cover in selected areas of Canberra from 1990–2023.
Source: Haizea Analytics

While the percentage of woody canopy cover varies across each of the sample sites, the trends in increase and decrease in canopy cover are closely aligned. A correlation between the peaks and troughs of woody cover shown in this graph can be seen with those of rainfall and soil moisture shown in Figure 5.5 below. Canopy cover for all sites was very similar at the start and finish of the study period, even though it varied greatly over the course of the 20 years in accordance with rainfall. Interestingly, Red Hill Nature Reserve, which contains predominantly native vegetation, shows the greatest variation in canopy cover over this time period and is also the only site to show a substantial net increase in canopy cover.

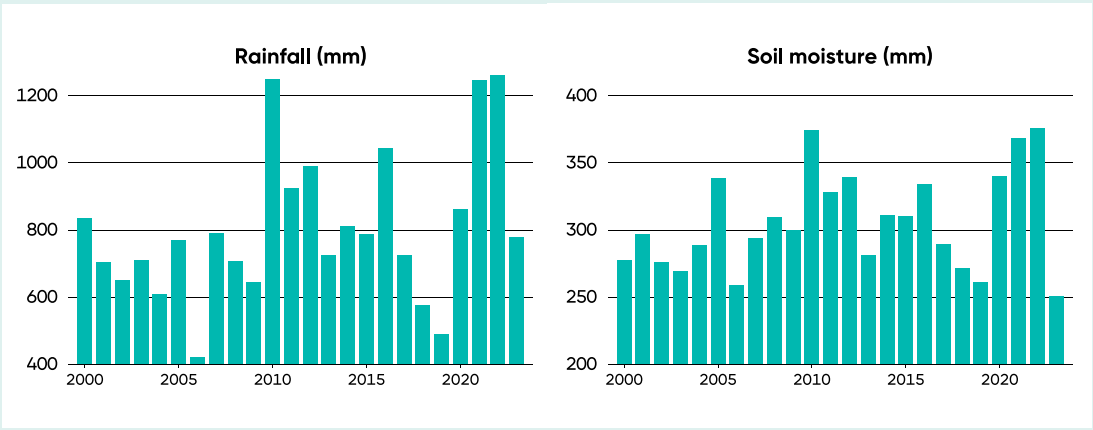


Figure 5.5. Annual rainfall and soil profile moisture content averaged across the ACT. Source: Australia's Environment Explorer[11]

This analysis of vegetation from 2004 to 2023 demonstrates that water availability is the primary driver of vegetation condition. Past urban development has also transformed land in the ACT, and over the analysis period, the ACT's building footprint grew by 40 per cent. Urban development led to notable losses in vegetation cover, particularly in suburbs in Gungahlin, Molonglo Valley and Jerrabomberra.

Environmental pressures do not occur in isolation from each other. In already degraded landscapes, disturbances like drought and fires have a compounding effect, causing more severe population declines compared to intact habitats. Additionally, reduced vegetation cover exacerbates the intensity of these events by increasing exposure and limiting available resources, and providing conditions for invasive weeds.

Ecological communities that are resilient to climate change and extreme disturbances (such as those from fire and extreme weather and climate events) are those that are in the healthiest condition to begin with.

5.2.2 Trends in vegetation condition

Urban expansion, especially into Canberra's northern and western edges, has raised concerns over vegetation degradation and its impacts on local biodiversity. This section aims to assess changes in vegetation condition over time in these areas and compares them to the rest of the ACT, identifying possible ecological degradation or improvements. It must be noted that remote sensing does not capture all aspects of vegetation condition and can miss key indicators of ecological degradation, such as invasive species, age structure or floristic diversity. Further details on methodology can be found in the full impact assessment report.[12]

Vegetation condition in the ACT generally improved between 2004 and 2023, driven by recovery from the Millennium Drought and 2003 bushfires, and by recent wet years. However, urban developments led to localised vegetation loss, especially in Gungahlin, Molonglo Valley, and Jerrabomberra, where vegetation cover declined by more than 20 per cent in some areas.

11 Australian National University and TERN, n.d. *Australia's Environment Explorer*. Available at: https://ausenv.tern.org.au/

12 Van Dijk, A., Rapley, S, Chen, M., et al, 2025. *Analysis of land use change and biodiversity trends in the ACT*. Prepared for the Office of the Commissioner for Sustainability and the Environment. Available at: https://envcomm.act.gov.au/analysis-of-land-use-change-and-biodiversity-trends-in-the-act

Average trends across the ACT

Vegetation trends over the period 2004–2023 can be expected to be at least in part affected by any trends in rainfall during that same period. The Australia's Environment Explorer[13] provides summarised data on environmental conditions averaged across regions, including the ACT (see Figure 5.6).[14]

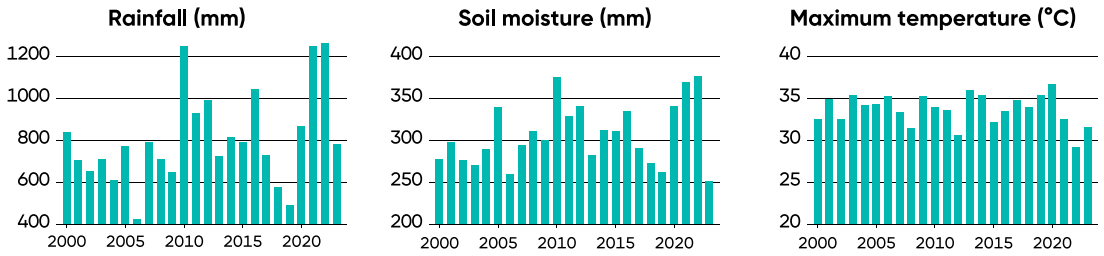


Figure 5.6. Annual rainfall, soil profile moisture content and maximum temperature averaged across the ACT.
Source: Australia's Environment Explorer[15]

The rainfall and soil moisture time series show an overall increasing trend for the period 2004–2023. The main reason is that the first years of the period (2004–2009) were part of the Millennium Drought that started around 2000, whereas the years 2020–2023 were exceptionally wet. The result is a weakly significant positive linear trend in rainfall of 12 mm per year – or +1.6 per cent per year when compared to the period average annual rainfall of 813 mm.

The last five decades have shown a highly significant increasing trend in high temperatures in the ACT,[16] but there was no significant trend during the period 2004–2023, partly because temperatures were relatively low in 2020–2023.

Vegetation growth across most of Canberra can be described as limited by water availability, especially in dry years, and therefore the inter-annual variations and overall slight positive trend in rainfall can be expected to be reflected in vegetation condition. This is borne out by data (see Figure 5.7) on exposed soil, leaf area and woody vegetation cover, which show a recovery from very poor vegetation conditions in 2004 due to drought and the 2003 fires, gradually improving to more stable conditions around the wet year 2010, and more or less following water availability patterns thereafter.

Overall, the last 20 years have seen an improvement in environmental conditions, albeit indicators have not exceeded those measured during 2000–2002, at the start of the Millennium Drought and before the 2003 fires.

13 Australian National University and TERN, n.d. *Australia's Environment Explorer*. Available at: https://ausenv.tern.org.au/

14 For more details, see Van Dijk, A. I. J. M. and Rahman, J., 2019. *Synthesising multiple observations into annual environmental condition reports: the OzWALD system and Australia's Environment Explorer*. 23rd International Congress on Modelling and Simulation, Canberra.

15 ibid.

16 Australian Government, Bureau of Meteorology. n.d. *Australian climate change site data*. Available at: http://www.bom.gov.au/cgi-bin/climate/hqsites/site_data.cgi?period=annual&variable=maxT&station=070351

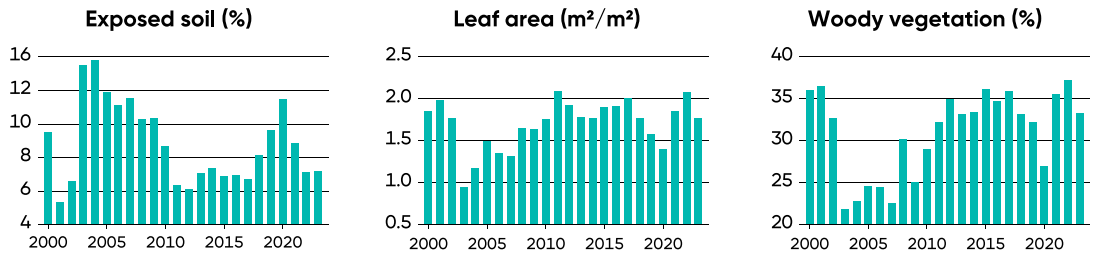


Figure 5.7. Annal average exposed soil, leaf area, and woody vegetation cover fraction averaged across the ACT.
Source: Australia's Environment Explorer[17]

Spatial patterns

A spatial mapping tool has been developed to show a range of land uses and vegetation condition indicators. This includes functionality to view two indicators side by side. The tool can be explored at https://act.terrak.io/.

Maps showing the spatial pattern trends for a selection of variables show that, on average and across most of the ACT, vegetation extent and condition improved between 2004 and 2023. Spatial patterns in vegetation trends were dominated by rotation and growth in forestry plantations and new urban developments along the western and northern edges.

Figures 5.8–5.10 show trends in bare soil, vegetation cover and vegetation greenness over this period. Some of the greatest loss of vegetation cover (typically >20 per cent over the period) occurred in the new developments in Gungahlin (Moncrieff, Throsby, Taylor, Crace), the Molonglo Valley (Wright, Coombs, Denman Prospect) and Jerrabomberra (Beard), as can be seen in Figure 5.9.

17 Australian National University and TERN, n.d. *Australia's Environment Explorer*. Available at: https://ausenv.tern.org.au/

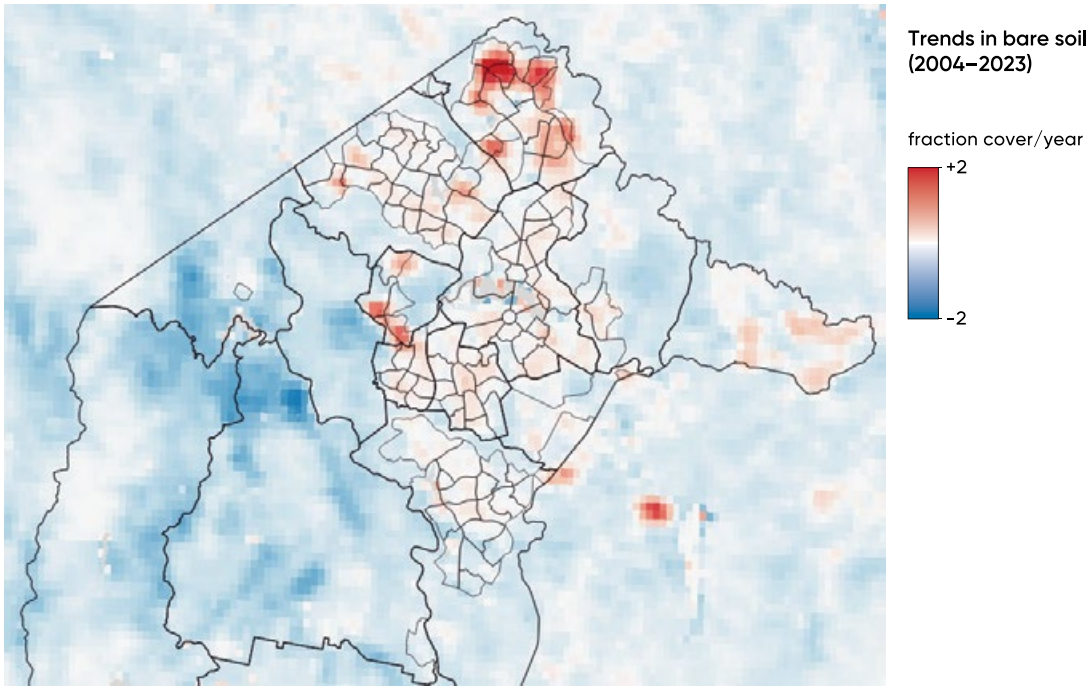


Figure 5.8. Linear trends (2004–2023) in unprotected soil (bare soil cover fraction, in percentage).
Source: Haizea Analytics

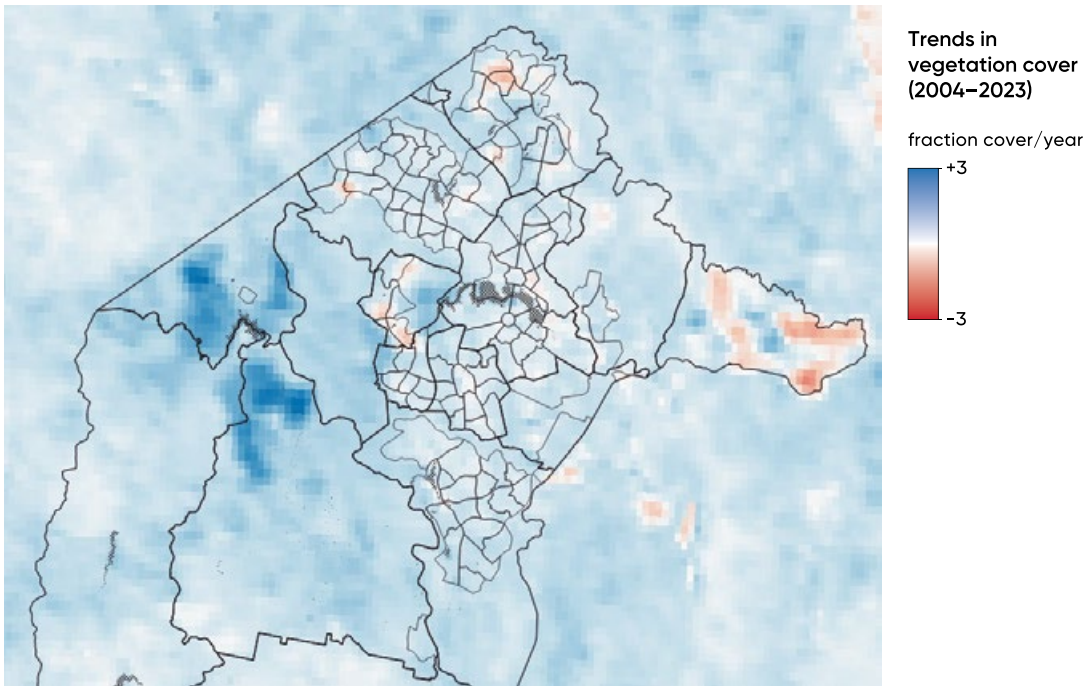


Figure 5.9. Linear trends (2004–2023) in vegetation cover across all vegetation types (photosynthetic vegetation cover fraction, in percentage).
Source: Haizea Analytics

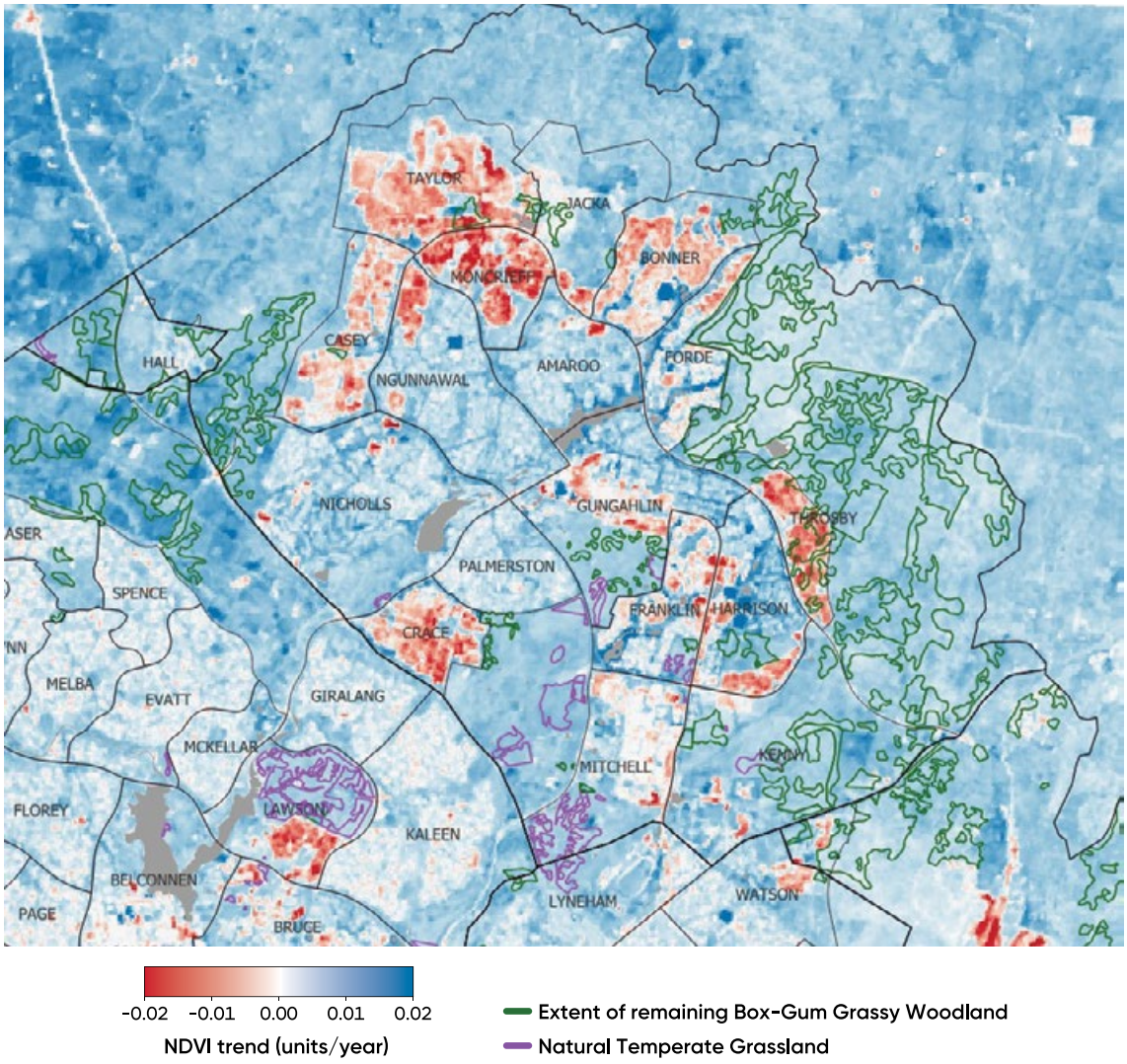


Figure 5.10. Linear trends (2004–2023) in vegetation greenness.[18] Also shown are the extent of remaining Box-Gum Grassy Woodland (green outlines) and Natural Temperate Grassland (purple outlines) around 2015.[19]
Source: Haizea Analytics

Discussion

The overall story told by these data is one of improving vegetation condition in the ACT over the past 20 years, attributable largely to favourable weather conditions especially water availability. This indicates the ability of the ACT's vegetation to recover from adverse climate events like the Millennium Drought if conditions are suitable. Importantly however, this analysis does not differentiate between native and non-native vegetation, so an improvement in overall vegetation condition cannot be taken as an improvement in the condition of native vegetation communities, where weeds will benefit from higher rainfall to an equal or greater extent than native plants.

18 NDVI, normalised difference vegetation cover between 0.1–0.9 for the Northern ACT, derived from Landsat annual geomedian data. See Roberts, D., Mueller, N., McIntyre, A., et al, 2017. *High-dimensional pixel composites from Earth observation time series*. IEEE Transactions on Geoscience and Remote Sensing, 55(11), 6254-6264.

19 ACT Government, 2018. *ACTGOV Vegetation Map 2018*.
Available at: https://www.arcgis.com/apps/mapviewer/index.html?layers=7ec1ec92a0254fd087d1998db41e0b3b

The data show that vegetation loss in new greenfield developments is severe, as can be seen in modelled vegetation trends for current greenfield developments in the west and north of the ACT. However, modelling for suburbs which were being established at the start of the study period, such as Franklin, show that developed areas recover their vegetation (although not in the same form as the original ecosystem) over time with the establishment of vegetation in road verges, parks and gardens.

While both these trends are encouraging, they emphasise more than ever the impact that climate change will have on our region's vegetation and its ability to recover from adverse events such as droughts, and from land clearing. It is essential that new suburbs are constructed in a way that incorporates substantial areas of open space in order for vegetation to return.

5.3 Ecological impacts of development in the ACT – threatened species and communities

As Canberra's urban boundary expands, critical habitats face potential reductions in size and quality. These ecosystems are vital for a range of native and threatened species, as well as being listed as critically endangered ecological communities in their own right. Their ongoing fragmentation contributes to biodiversity declines via habitat loss, reduced connectivity and increased edge effects. This translates to declining populations, reduced resilience to future events (e.g. drought, fire, climate change) and a reduction in the benefits that nature provides to people.

This section seeks to interpret population trends of native and threatened species affected by urban development in the ACT and identify key threatening processes. OCSE commissioned an independent study,[20] which included literature reviews, consultation with ecological experts, and analysis of survey and sighting data to document species trends, distributions and threats, including habitat loss and climate change.

Canberra Grassland Earless Dragon.
Source: Mark Jekabsons

The study determined that urban development affected 29 of the ACT's 66 threatened species, including birds, mammals, reptiles and insects. Five threatened bird species declined significantly from 2004–2017, while two showed population increases. Grassland fauna, such as the Canberra Grassland Earless Dragon, experienced severe declines, with local extinctions at several monitoring sites.

Two lowland threatened vegetation communities in the ACT are considered Matters of National Environmental Significance (MNES): Box-Gum Grassy Woodland and Natural Temperate Grassland. Loss of these two ecological communities since 2015 was mapped in an ACT Government study, which reported a loss of 129 ha (-1.9 per cent) of Box-Gum Grassy Woodland and 17 ha (-1.6 per cent) of Natural Temperate Grassland between 2018 and 2023.[21] Data for losses prior to 2015 were not available.

20 Van Dijk, A., Rapley, S, Chen, M. et al, 2025. *Analysis of land use change and biodiversity trends in the ACT*. Prepared for the Office of the Commissioner for Sustainability and the Environment. Available at: https://envcomm.act.gov.au/analysis-of-land-use-change-and-biodiversity-trends-in-the-act

21 Conservator of Flora and Fauna, 2024. *ACT Nature Conservation Strategy 2013–23 – Progress Against Implementation Plan 2* (2019–23).

The remaining MNES showed improvement in vegetation condition between 2004 and 2023, based on increased vegetation cover and tree crown density but not taking into account species composition, vegetation structure or presence of exotic species. This improvement is attributed to recovery from a low baseline due to drought and fire, along with above-average rainfall in later years.

Urban expansion in the ACT affects several threatened bird, mammal and plant species through a complex interplay of habitat loss and fragmentation, interspecies competition and predation, and climate factors.

While a focus on threatened species is often useful in discussions about environmental conservation measures, it should be remembered that they must be viewed as indicators of broader ecosystem health. An increase in the number and threat level of threatened species may be taken as a proxy for a broader decline in biodiversity. Protective action for remaining areas of suitable habitat must be taken to avoid more species being added to this list.

5.3.1 Threatened ecological communities

While numbers provide insights into the condition and extent of MNES in the ACT, they do not tell the whole story for several reasons. First, vegetation loss in one area may be offset by gains elsewhere. For example, strong localised losses of Box-Gum Grassy Woodland in Belconnen and Stromlo were counterbalanced by smaller increases in tree and ground cover elsewhere, but the total area of intact Box-Gum Grassy Woodland still declined. Second, some vegetation may persist or be restored after urban development but may no longer qualify as MNES due to structural or floristic changes. Third, available vegetation mapping reflects communities as of 2012–2015, so any MNES lost before 2012 is not captured in the mapping or resulting figures.

As noted in section 5.3, recent analysis by the ACT Office of Nature Conservation[22] compared the 2018 ACT Vegetation Map with 2023 aerial imagery. It found a loss of 129 ha (-1.9 per cent) of Box-Gum Grassy Woodland and 17 ha (-1.6 per cent) of Natural Temperate Grassland since 2015, representing loss rates of approximately 2.4 per cent and 2.0 per cent per decade, respectively. The same study suggested that 538 ha of native-derived secondary grassland – which does not meet the criteria for MNES but can still be a critical habitat for grassland species – were lost during this period.

Box-Gum Grassy Woodland. Source: Helen Cross

Yellow Box / Blakely's Red Gum Grassy Woodland

Box-Gum Grassy Woodland is a Critically Endangered ecosystem nationally characterised by woodlands dominated by Yellow Box (*Eucalyptus melliodora*) and Blakely's Red Gum (*Eucalyptus blakelyi*). These woodlands support a rich understorey of native grasses and forbs, providing habitat for a range of threatened species, including woodland birds.
The Box-Gum Grassy Woodland ecosystem,

22 ibid.

once widespread, has been heavily cleared and fragmented, with over 95 per cent of its original area lost nationally. This has left small, isolated patches vulnerable to further degradation from urban and agricultural pressures. The ACT contains the largest remnants in good condition, with 77 per cent of the remaining grassy woodland within the reserve network and 23 per cent outside it. Within the ACT, 66 per cent of the original cover has been lost.

Box-Gum Grassy Woodland occupies 7,054 ha in the ACT. Of this, 1,035 ha (14.7 per cent) is within urban divisions. Overall vegetation cover increased from 83 per cent to 92 per cent of the urban woodland area, and tree crown cover increased from 25 per cent to 28 per cent. Similar to other vegetation types (discussed in 5.2.2 Trends in Vegetation Condition), the 2004 imagery shows poor vegetation conditions due to drought and associated overgrazing by stock or kangaroos, fire and winter senescence of some grassy vegetation (especially tussock grasses). Later years show denser and greener vegetation in response to better water availability.[23]

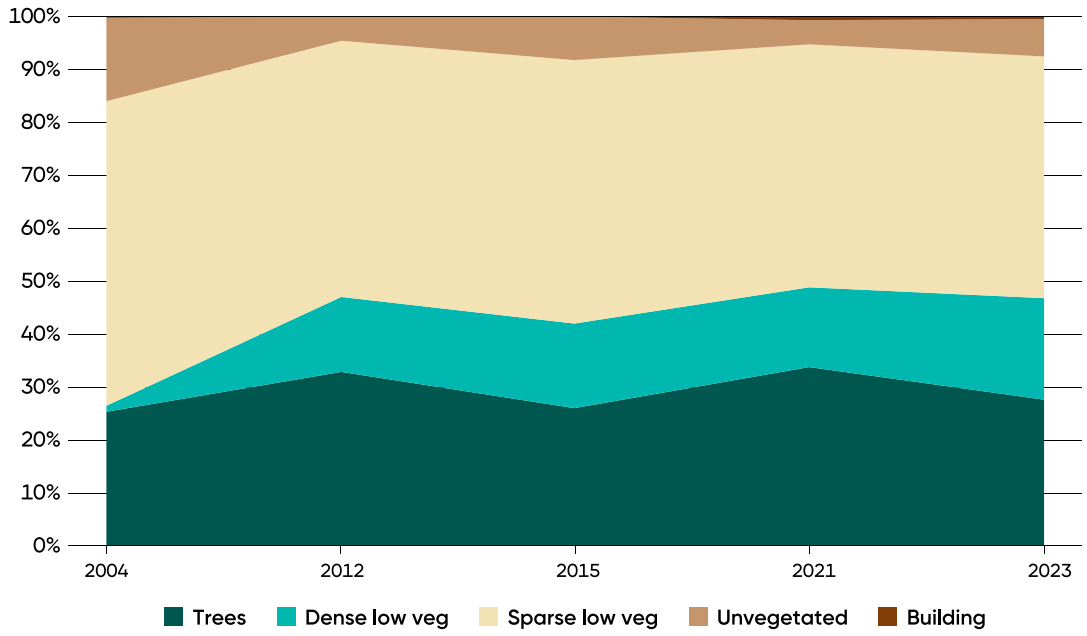


Figure 5.11. Percentage cover of vegetation types, unvegetated areas, and buildings in Box-Gum Grassy Woodland in the ACT.[24]
Source: Haizea Analytics

Despite these broadly increasing trends (see Figure 5.11), declines in vegetation cover and/or crown cover between 2004 and 2023 occurred in some divisions and districts. By division, the largest reductions were found in the suburbs of Chapman (-0.3 ha) and Macnamara (-0.2 ha). The largest reductions in tree crown cover were recorded in Strathnairn (-3 ha) and Hall (-1 ha). Between 2012 and 2023, vegetation cover increased in all districts except Belconnen (-28 ha) and Stromlo (-46 ha). These losses were offset by vegetation

23 It should be noted that airborne imagery can provide detailed information on vegetation structure but much less so on floristic composition, which is essential for identifying vegetation types as MNES or structurally similar, non-threatened vegetation communities. Thus, grassland can be identified from imagery but often not reliably classified as Natural Temperate Grassland, derived native grassland or exotic grassland. Similarly, woodland can be identified but "Blakely's Red Gum – Yellow Box tall grassy woodland" cannot be floristically distinguished from other eucalypt woodlands. The ACT Vegetation Map was therefore used to distinguish vegetation types.

24 Note: the percentages for 2004 and 2009 relate to part of the ACT only due to limited data availability.

increases in other districts. However, the processes behind these changes differ: vegetation increases were mostly associated with vegetation recovery on bare soil, whereas most declines in Belconnen and Stromlo were due to land clearing for urban development. The total area of buildings in former Box-Gum Grassy Woodland increased from 3.6 ha in 2012 to 11.6 ha in 2023.

The impact of clearing and degradation of Box-Gum Grassy Woodland on the ACT's biodiversity extends across multiple species groups, with woodland birds, mammals and flora particularly affected by habitat loss, fragmentation, and in some cases interacting with associated pressures.

Natural Temperate Lowland Grassland

Natural Temperate Grassland[25], the ACT's second EPBC-listed Critically Endangered ecosystem, is characterised by diverse native grasses, primarily tussock grasses such as wallaby grass (*Rytidosperma* sp), spear grass (*Austrostipa* sp) and kangaroo grass (*Themeda triandra*), interspersed with forbs. Approximately 99 per cent of this grassland has been lost or modified across Australia since colonisation, leaving small, often degraded patches. In the ACT, around 1,000 ha of the original 15,500 ha remain, with less than half in the ACT reserve estate. About 28 per cent of the grassland in the ACT is on National Land, managed by the National Capital Authority, and 11 per cent is on non-reserved land.

Natural Temperate Grassland occupies about 1,070 ha in the ACT. Of this, 509 ha (47.5 per cent) is within urban divisions. Vegetation cover (including both native and exotic vegetation) varied between years (see Figure 5.12) but showed an overall increasing trend, rising from 67 per cent in 2004 to 95 per cent in 2023. This trend reflects recovery from drought and fire. Tree crown cover remained low, as is appropriate for this vegetation community.

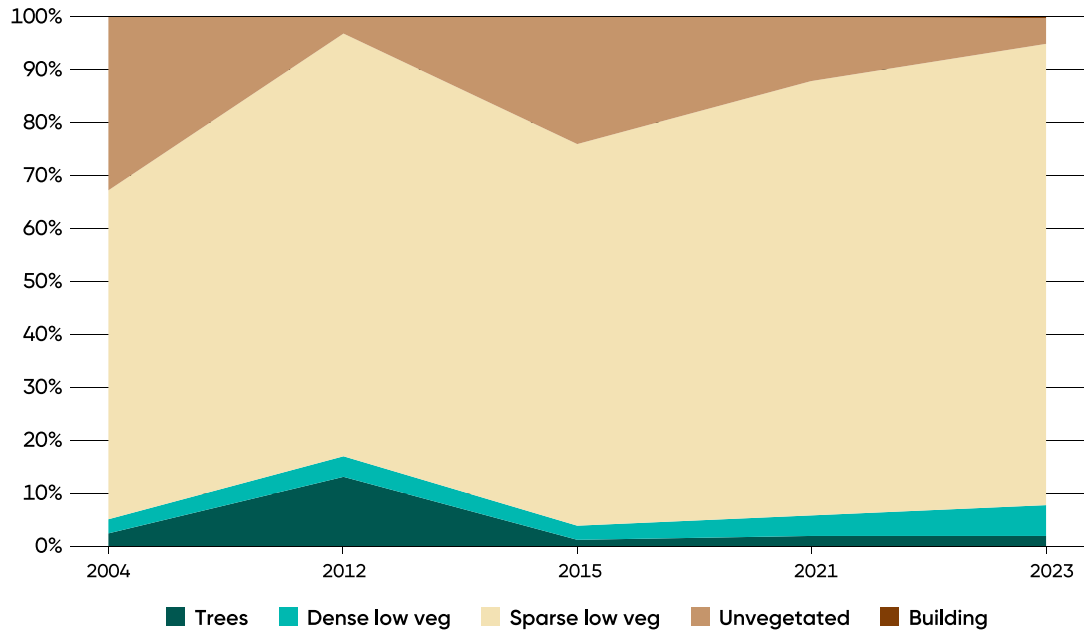


Figure 5.12. Percentage cover of vegetation types, unvegetated areas, and buildings in Natural Temperate Grassland in the ACT, 2004–2023.
Source: Haizea Analytics

25 For the purposes of this Investigation, Natural Temperate Grassland refers to lowland grasslands only, not upland natural grassland ecosystems which are not threatened by development in the ACT.

Despite the overall increase in ground cover, losses occurred in several divisions, including Dunlop (-2.8 ha), Whitlam (-2.5 ha), Denman Prospect (-1.3 ha), Latham (-0.5 ha), and Bruce and Belconnen (-0.1 ha each). The total area of buildings in (former) Natural Temperate Grassland increased from 0.2 ha in 2012 to 1.3 ha in 2023.

Natural Temperate Grassland has already been majorly impacted by clearing for past urban development and agricultural land uses. The remnant pieces are often small, fragmented and lacking connectivity. As a result, populations of grassland fauna are small and isolated, leaving them vulnerable to stochastic events (e.g. population extinction due to fire or weather events, which are increasing in prevalence). Furthermore, grassland fauna has low dispersal ability and there is a current lack of connectivity between ACT populations.[26]

For information on how loss of Natural Temperate Grassland is impacting threatened grassland fauna, see 5.3.2.

Effects of urban development on threatened ecosystems

Urban development between 2004 and 2023 has had limited direct impact on the overall extent of remnant Box-Gum Grassy Woodland and Natural Temperate Grassland communities included in the ACT Vegetation Map, as clearing has generally been avoided in planning new development where possible. However, urbanisation also impacts nearby ecosystems in other, less direct ways through edge effects. The distance over which such edge effects occur varies widely. The most localised effects, such as the direct impact of motorised traffic, noise and light pollution and competition from Noisy Miners may not extend much beyond 100 m of the edge. Other impacts, such as human disturbance, roaming domestic pets or feral animals and invasive plant seed dispersal, may extend beyond a kilometre or more.[27,28]

The scale dependence of edge effects also raises the question as to how to define "urban area". At its most restricted, it could include only the actual footprint of buildings or sealed roads, while in the broadest sense, it could include any area or vegetation directly affected by construction, infrastructure or habitation. For this report, urbanised areas were mapped as any one ha area of which more than 10 per cent is covered by buildings.

Existing and newly urbanised areas in 2004 and 2021 are shown in Figure 5.14, along with areas that are within 500 m of urbanised areas. The 500 m represents an illustrative value that is intermediate for the range of distances over which different edge effects occur. Clearly, a significantly larger proportion of the ACT's two MNES communities is now located in proximity of urban areas, indicating increased pressure from urban encroachment through edge effects.

26 Freeman, A. A., 2024. *Mapping ecological connectivity in urban landscapes for conservation planning*. BSc Thesis, Australian National University.

27 Ikin, K., Barton, P. S., Knight, E., et al, 2014. *Bird community responses to the edge between suburbs and reserves*. Oecologia, 174, 545–557.

28 Woinarski, J. C. Z., Legge, S. M., Dickman, C. R., 2019. *Cats in Australia: Companion and Killer*. CSIRO Publishing, Clayton, p. 344.

Different urban edge effects on communities and species extend over varying distances, making it useful to examine the percentage of each MNES community within specific distances of the nearest urban area and how this has changed between 2004 and 2021 (Figure 5.13). For instance, while six per cent of remaining Box-Gum Grassy Woodland and eight per cent of Natural Temperate Grassland were already within 200 m of urban areas in 2004, these figures nearly doubled to 11 per cent and 18 per cent, respectively, by 2021. Similarly, the area within 500 m increased from 15 per cent to 25 per cent for Box-Gum Grassy Woodland and from 28 per cent to 44 per cent for Natural Temperate Grassland. The most substantial increases occurred at a distance of approximately 800 m for Box-Gum Grassy Woodland, rising from 25 per cent to 38 per cent of its total extent, and at around 1,500 m for Natural Temperate Grassland, increasing from 57 per cent to 85 per cent. In Chapter 7, the potential increase in edge effects from future urban development in the Western Edge Investigation Area is assessed following the same methodology.

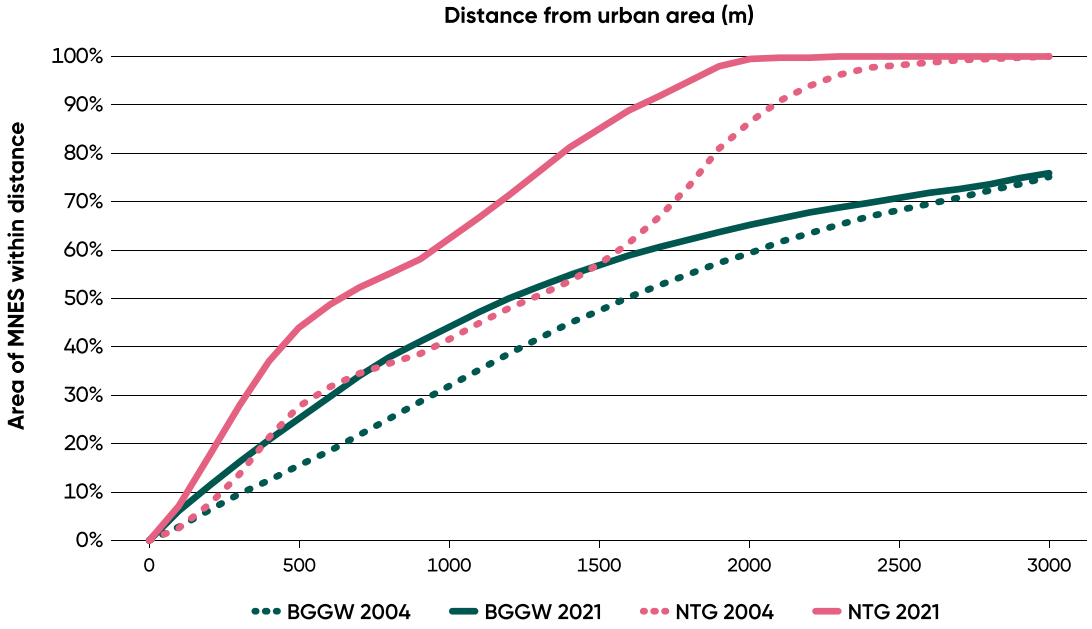


Figure 5.13. Percentage of the total mapped area of Box-Gum Grassy Woodland and Natural Temperate Grassland located within specific distances from the nearest urban area. Source: Haizea Analytics

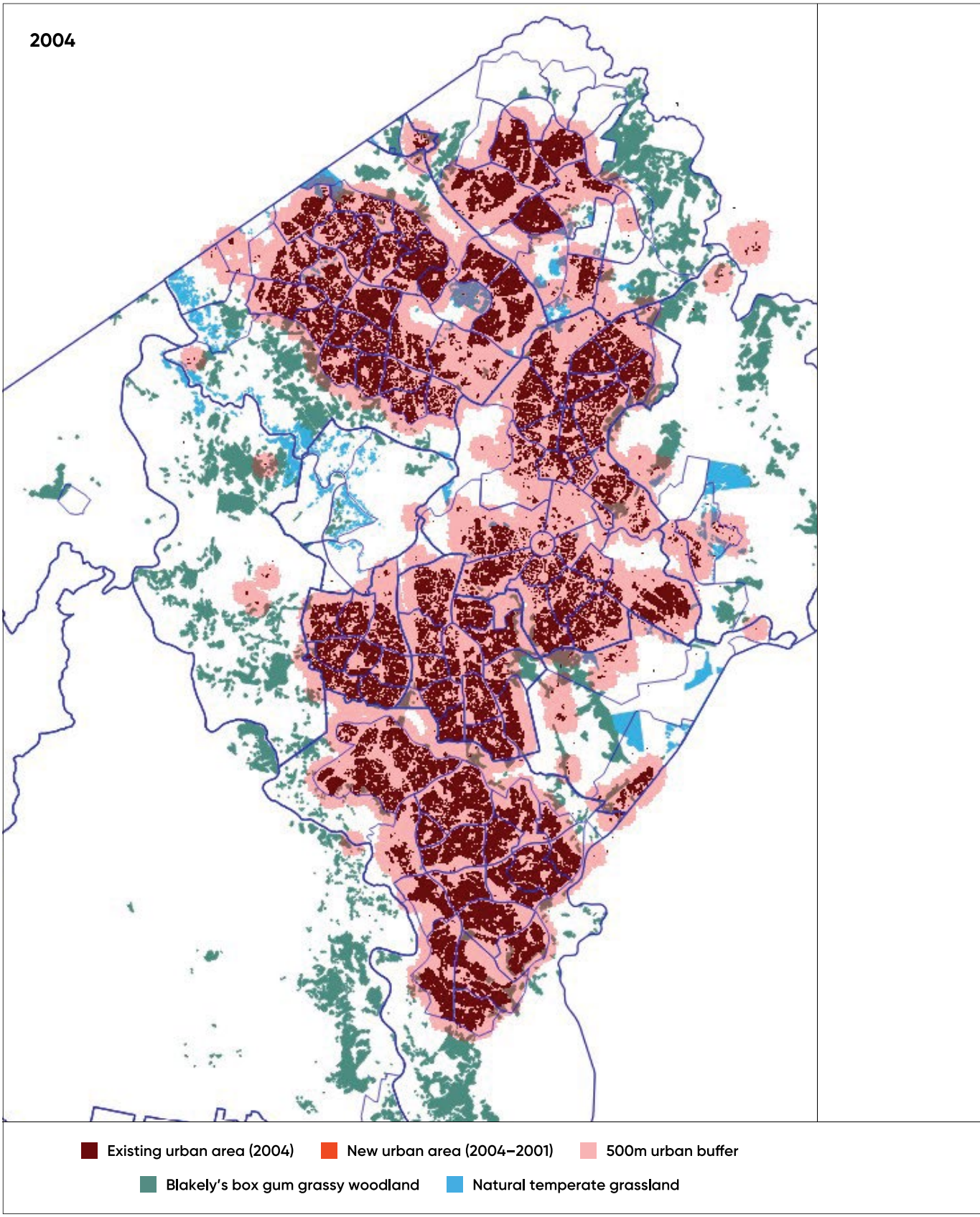
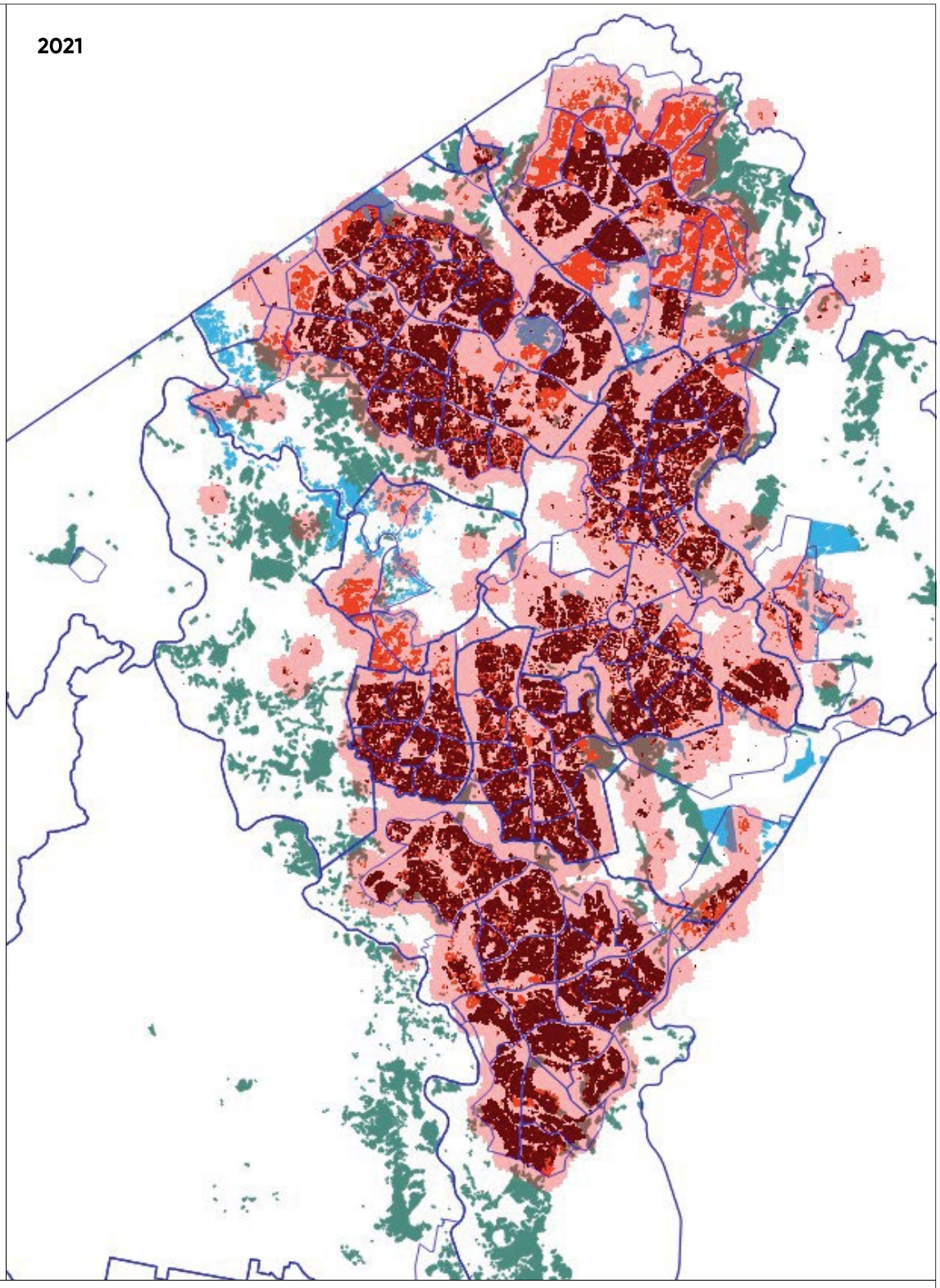


Figure 5.14. Urban areas in 2004 and 2021, showing the increased proximity of urban areas to threatened ecosystems during this time period, as illustrated by a 500m buffer.
Source: Haizea Analytics


2021

What does urban development have to do with the ACT's greenhouse gas emissions?

Urban expansion not only impacts biodiversity but also contributes to greenhouse gas emissions through the conversion of vegetation. Urban development almost always results in carbon loss and an increase in greenhouse gas emissions from the local area.

There are several causes for this:

1. Incidental direct and indirect emissions from groundworks and construction (e.g. fuel use, concrete production, etc).
2. Ongoing direct and indirect emissions associated with habitation (e.g. domestic energy use, transport, utilities and waste management).
3. The loss of carbon stored in biomass and soil organic matter.
4. The reduction in future carbon sequestration[29] capacity.

In this section, we aim to estimate emissions from land use changes associated with urban development. This estimate was conducted by independent external consultants using publicly available data from a range of sources.[30] The key findings outlined below focus on biomass loss and soil carbon release underpinned by detailed vegetation mapping, with greenhouse gas emissions calculated by applying biomass estimation methods for trees and soil data for organic matter content.

Destruction of vegetation communities with high standing biomass and soils rich in organic carbon will cause greater carbon losses. Several factors influence the rate of emissions:

1. *Retention of vegetation:* Preserving existing vegetation, and especially trees, can significantly reduce carbon loss.
2. *Biomass disposal methods:* Emissions are higher when vegetation is burned or left to decompose. Burying, composting, mulching and retaining coarse debris can help reduce emissions.
3. *Soil disturbance and excavation:* Extensive soil excavation and groundworks are likely to lead to greater carbon release than minimal clearing and avoiding soil disturbance.
4. *Soil sealing:* Covering soil with concrete or asphalt may reduce microbial activity, slowing the breakdown of organic matter and potentially preserving some of the soil carbon.

Loss of carbon stored in biomass and soil organic matter

Urban development raises local greenhouse gas emissions per unit area primarily from initial development and subsequent habitation. These are relatively unaffected by the original land cover.

29 Sequestration is the process of storing carbon in a carbon pool as part of the natural carbon cycle.

30 Van Dijk, A., Rapley, S, Chen, M., et al, 2025. *Analysis of land use change and biodiversity trends in the ACT*. Prepared for the Office of the Commissioner for Sustainability and the Environment. Available at: https://envcomm.act.gov.au/analysis-of-land-use-change-and-biodiversity-trends-in-the-act

The typical biomass and soil organic carbon content in an ecosystem can provide a benchmark for potential carbon losses. There are usually higher values associated with greater living biomass, such as areas containing more, and larger, trees. Clearing grassland and woodlands for urban development may release up to four tonnes of carbon per hectare per year from soil. More carbon is stored in leaf litter, dead wood and felled trees.

Loss of carbon sequestration capacity

In addition to the release of stored carbon during the land clearing phase of development, urban expansion likely increases long-term greenhouse gas emissions by reducing carbon uptake and sequestration in biomass and soil. The impacts on future carbon storage depends on many factors – such as what extent of vegetation is retained on a site and how much was initially present.

Analysis suggests that there is a potential carbon sequestration loss of 0.5 to four tonnes of carbon per year for every hectare of vegetation cleared. There are multiple ways to estimate potential loss. However, none of these approaches to estimation account for periodic disturbances. Net long-term carbon sequestration is further reduced by carbon losses from logging in plantation forests and periodic bushfires. All analysis types are categorically clear. Unvegetated surfaces do not sequester carbon and the loss of sequestration capacity is proportional to vegetation removal.

A rough estimate of the magnitude of the impact of tree cover changes in new urban developments on carbon sequestration can be obtained from the land cover mapping for 2004 and 2023. We examine the newly developed suburbs Coombs and Wright in Molonglo Valley, Macnamara in Belconnen, and Taylor and Moncrieff in Gungahlin. The change in percentage of tree canopy area in these four suburbs was five per cent of their combined area, varying from a two per cent loss in Taylor to a 16 per cent loss in Wright. Using the range of carbon sequestration rates of 0.35 to 1.1 k carbon per m^2 of crown area, this produces an average loss in annual sequestration rate of around 0.4 (range 0.19–0.64) tonne of carbon per hectare of urban area per year. The four suburbs combined have an area of 14 km^2; combining that with their combined average tree canopy cover loss of five per cent yields an estimated loss of sequestration of about 600 (range 274–917) tonnes of carbon per year.

Avoiding further carbon loss

There are clear opportunities to reduce emissions from vegetation clearing and soil disturbance. Many of the practices that aim to protect ecological and amenity values, or minimise soil erosion, also serve to limit emissions.

However, carbon emissions are an inevitable consequence of land use change. Retaining vegetation, minimising soil disturbance, and implementing revegetation efforts can reduce emissions while preserving long-term carbon sequestration capacity and providing broader environmental benefits.

5.3.2 Threatened species affected by urban development in the ACT

The ACT is home to 66 species listed as Threatened at either federal or Territory level.[31] Of these, 29 occur in or near urban areas or are otherwise likely to be impacted by urban development (Table 5.1). Nine species that potentially or rarely occur in urban areas were not considered because urban expansion in the ACT is unlikely to have influenced their population. The remaining 28 species are not found in or near urban areas in the ACT. They typically occur only on protected land, in captivity and/or may be considered locally extinct. Examples include the Koala and the Northern Corroboree Frog.

The key threatening processes for each species were gleaned from the information on the species contained in the federal and Territory listings. Among the 29 species potentially affected by urban expansion, loss or degradation of Box-Gum Grassy Woodland or Natural Temperate Grassland is the key threatening process for 10 and nine species, respectively. Another five species are threatened by changes along river corridors and river water quality. The remaining five species are not associated with any of the previous communities but do occur within the urban footprint and are, to different degrees, vulnerable to changes in urban land management.

Table 5.1. Threatened species that occur in current or potential urban areas in the ACT with population trend from 2004–2023.[32]

EPBC Status	NCA[33] Status	Class	Scientific name	Common name	Trend
EN	VU	Bird	Melanodryas cucullata c.	Hooded Robin (south eastern)	down
VU	SP	Bird	Stagonopleura guttata	Diamond Firetail	stable
VU	SP	Bird	Aphelocephala leucopsis	Southern Whiteface	down
VU	VU	Bird	Polytelis swainsonii	Superb Parrot	up
VU	VU	Bird	Climacteris picumnus victoriae	Brown Treecreeper (south eastern)	down
NL	VU	Bird	Daphoenositta chrysoptera	Varied Sittella	down
NL	VU	Bird	Lalage tricolor	White-winged Triller	stable
NL	VU	Bird	Petroica boodang	Scarlet Robin	stable
NL	VU	Bird	Hieraaetus morphnoides	Little Eagle	stable
EN	EN	Bird	Callocephalon fimbriatum	Gang-gang Cockatoo*	up
VU	VU	Bird	Calyptorhynchus lathami l.	Glossy Black-cockatoo (south eastern)	down
VU	VU	Mammal	Pteropus poliocephalus	Grey-headed Flying-fox	stable
EN	EN	Insect	Keyacris scurra	Key's Matchstick Grasshopper	down
NL	VU	Insect	Perunga ochracea	Perunga Grasshopper	down

31 Van Dijk, A., Rapley, S, Chen, M., et al, 2025. *Analysis of land use change and biodiversity trends in the ACT*. Prepared for the Office of the Commissioner for Sustainability and the Environment. Available at: https://envcomm.act.gov.au/analysis-of-land-use-change-and-biodiversity-trends-in-the-act

32 ibid.

33 ACT Government, 2024. *Nature Conservation Act 2014 (ACT), Republication No 32.*

EPBC Status	NCA[33] Status	Class	Scientific name	Common name	Trend
VU	VU	Insect	Synemon plana	Golden Sun Moth	down
CE	CE	Reptile	Tympanocryptis lineata	Canberra Grassland Earless Dragon	down
VU	VU	Reptile	Aprasia parapulchella	Pink-tailed Worm-lizard	down
VU	VU	Reptile	Delma impar	Striped Legless Lizard	down
VU	SP	Fish	Maccullochella peelii	Murray Cod	?
CE	EN	Plant	Lepidium ginninderrense	Ginninderra Peppercress	?
EN	EN	Plant	Rutidosis leptorrynchoides	Button Wrinklewort*	?
EN	SP	Plant	Leucochrysum albicans tricolor	Hoary Sunray*	up
EN	EN	Plant	Swainsona recta	Small Purple Pea	?
CE	CE	Plant	Caladenia actensis	Canberra Spider Orchid	?
VU	VU	Plant	Thesium australe	Austral Toadflax	?
NL	EN	Plant	Bossiaea grayi	Murrumbidgee Bossiaea	?
EN	EN	Plant	Muehlenbeckia tuggeranong	Tuggeranong Lignum	?
EN	EN	Plant	Prasophyllum petilum	Tarengo Leek Orchid	?
VU	VU	Plant	Eucalyptus aggregata	Black Gum	up

EN = Endangered; CE = Critically Endangered; VU = Vulnerable; SP = Special protection status;
NL = Not listed under this instrument.

Species are shaded by their key threat: *teal* for loss of Box-Gum Grassy Woodland; *yellow* for loss of Natural Temperate Grassland; *pink* for river corridor degradation; *blue* for populations that occur within the existing urban footprint; and *grey* for those primarily affected by factors outside of the ACT. Species tagged with * are primarily threatened by the shaded category but also occur in the urban footprint.

The fact that eight species appearing in this table were added or upgraded since 2020 and the Black Summer bushfires raises another important point, namely that in the current context of climate change it is possible for species which were previously not viewed as being at risk to be impacted suddenly and catastrophically by landscape scale events such as bushfires and floods. For this reason it is more important than ever to ensure **all** remaining native ecosystems are conserved to the greatest degree possible.

A review of the literature demonstrated that there is relatively little quantitative information on the trajectory of threatened species in the ACT, aside from the trends described in each species' listing assessment. The best-monitored class of species are birds, for which survey data are available from the Canberra Ornithologists Group, a non-government volunteer organisation. With a few exceptions, no suitable population data could be identified to determine long-term population trends in the ACT for the majority of other threatened species. The trend analysis for bird populations in this report is therefore more comprehensive than for other species.

5.3.2.1 Birds

Reporting rates for each threatened bird species discussed in this section were retrieved from the Canberra Ornithologists Group website.[34] Linear trends for 2004–2017 are shown in Table 5.2 (reporting rates are only available up to 2017). Five species severely declined during the period: the Glossy Black-Cockatoo, Hooded Robin, Brown Treecreeper, Southern Whiteface and Varied Sittella. Conversely, the Gang-gang Cockatoo and Superb Parrot showed increases in reporting rates. The population of the remaining four species appears to show small declines.

The Gang-gang Cockatoo was added to the ACT's threatened species list in 2022.
Source: Ryan Colley

Table 5.2. Trends in population changes for threatened bird species in the ACT from 2004 to 2017. Population trends are represented as percentage change.

Species Name	Scientific Name	Trend (% per year, 2004–2017)
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	-23%
Hooded Robin	*Melanodryas cucullata*	-12%
Brown Treecreeper	*Climacteris picumnus*	-11%
Southern Whiteface	*Aphelocephala leucopsis*	-9%
Varied Sittella	*Daphoenositta chrysoptera*	-8%
Diamond Firetail	*Stagonopleura guttata*	-5%
White-winged Triller	*Lalage tricolor*	-4%
Little Eagle	*Hieraaetus morphnoides*	-3%
Scarlet Robin	*Petroica boodang*	-1%
Gang-gang Cockatoo	*Callocephalon fimbriatum*	+3%
Superb Parrot	*Polytelis swainsonii*	+10%

The same survey data show that not only threatened species saw significant negative or positive trends during the years 2004–2017. Several other small woodland birds also showed declines, such as Jacky Winter (*Microeca fascinans*), Leaden Flycatcher (*Myiagra rubecula*), Restless Flycatcher (*Myiagra inquieta*), Striated Pardalote (*Pardalotus striatus*) and White-throated Treecreeper (*Cormobates leucophaea*). Conversely, several bird species showed increasing reporting rates, importantly including the Noisy Miner (*Manorina melanocephala*; three per cent per year) but also several less common species.

Most species showed a decline before around 2010, then an increase until 2014, followed by another decline towards 2017. This pattern can presumably be attributed to the influence of water availability on the relative compensation of breeding success on adult mortality and suggests that those populations may increase again due to the return of wetter conditions from 2020–2023.

The Little Eagle is at risk of local extinction in the ACT due to failure of nesting attempts and loss of breeding habitat. Locally, they use mature eucalypts in the Molonglo and Murrumbidgee river corridors to breed. The ACT population is probably part of a national population with genetic mixing across the range, with tracked birds travelling to the

34. Canberra Ornithologists Group. n.d. Ogbirds. Available at: https://canberrabirds.org.au/

Northern Territory, Queensland and urban Melbourne.[35] Loss of paddock trees (retained mature trees in agricultural use areas) for urban development is likely to have a negative impact on Little Eagle nesting. Anticoagulant rodenticides, which are generally likely to be used at higher densities in urban/peri-urban areas, are also likely to adversely affect raptors such as the Little Eagle.

Woodland birds in Australia, including in the ACT, have seen notable declines, prompting conservation concerns since the 1990s.[36] Several threatened woodland species in the ACT, including the Hooded Robin, Diamond Firetail and Brown Treecreeper, have experienced continued population reductions.[37]

The Hooded Robin

The Hooded Robin exemplifies how woodland bird populations have been affected. In the ACT, this species has suffered a 90 per cent decline since 1998. They formerly occurred in woodlands in North Canberra (always at an irregular rate with small populations) but underwent a sharp decline in 2003–2004.[38] Urban development in the Gungahlin area commenced in 1991 and coincided with the onset of their decline in reporting rate. The reserve network has not mitigated their decline. Hooded Robins persisted in central woodland reserves (Majura and Campbell Park) until circa 1996 and the northern woodland reserves (Mulligans Flat, Goorooyarroo) until circa 2007.

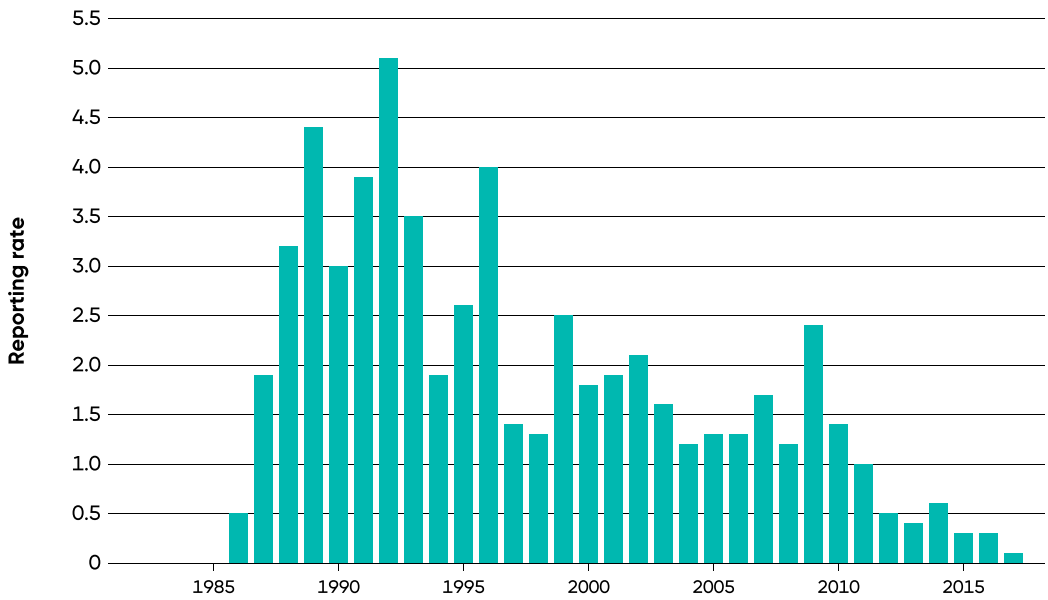


Figure 5.15. Hooded Robin reporting rates.
Source: Canberra Birds[39]

35 Rae, S., 2023. *Little Eagles in the Western Edge area of the ACT*. Prepared for the ACT Government. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0007/2510989/little-eagles-in-the-western-edge-of-the-act-report.pdf

36 Bennett, A. F. and Watson, D. M., 2011. *Declining woodland birds – is our science making a difference?* Emu, 111(1), i–vi.

37 Replaced with Canberra Ornithologists Group, n.d. *Canberra Birds*. Available at: https://canberrabirds.org.au/our-birds/bird-finder/

38 Cunningham, R. A. and Rowell, A. M., 2006. *A Statistical Analysis of Trends in Detection Rates of Woodland Birds in the ACT, 1998 to 2004*. Canberra Bird Notes, 31(2), 73–110.

39 Canberra Ornithologists Group, n.d. *Canberra Birds*. Available at: https://canberrabirds.org.au/

Hooded Robin.
Source: David Cook via canberrabirds.org.au/our-birds/photo-gallery

The most likely reasons for their disappearance are degradation of remnant habitat and competition from urban tolerant bird species. Listing advice for the species contends that they cannot persist in woodland remnants smaller than 200 ha. Although the northern reserves like Mulligans Flat and Goorooyarroo are large (>1600 ha combined), the availability of open spaces with rocks and woody debris needed for foraging has been declining due to an increase in shrubby vegetation cover. Studies on the Brown Treecreeper, which has experienced similar declines, indicate that these habitat changes likely reduce the suitability of these reserves for woodland birds.[40] Urban encroachment around reserves has introduced further edge effects, including exotic plants and animals, human disturbance and pressure from invasive predators.

Competition from urban-tolerant species may have compounded the Hooded Robin's decline. Hooded Robins require hollows for nesting, which have become increasingly scarce due to the loss of mature trees. Species like the Rainbow Lorikeet, Galah and Crimson Rosella, which are abundant in urban areas, likely outcompete Hooded Robins for these limited nesting sites.[41] Additionally, the exclusion of exotic predators, such as foxes and cats, by the Mulligans Flat Sanctuary fence, was completed too late (in 2008) to benefit the Hooded Robin, which was already extirpated.

The Hooded Robin's severe decline reflects the complex challenges facing woodland birds near urbanised areas. Their loss from urban-adjacent reserves demonstrates that while habitat fragmentation and degradation are significant factors, the interaction with edge effects, competition from other species and climatic pressures likely contribute to declines beyond the impacts of habitat loss alone.

Notably, Glossy Black-Cockatoo and Gang-gang Cockatoo population declines at the national level were assessed as being unconnected with current threats in the ACT. Glossy Black-Cockatoos are rare visitors to the ACT, where more than 90 per cent of sightings are from Mt Majura and Mt Ainslie, where there are suitable food trees. Loss of sheoaks (*Allocasuarina* spp. and *Casuarina* spp.) due to inappropriate fire regimes and clearing are the primary drivers of their decline but this has not occurred in the ACT during the study period. The last breeding record for the species in the ACT was on Mt Majura in 2004.

The population of Gang-gang Cockatoos has increased in the ACT while declining elsewhere in Australia by more than 70 per cent since 1999.[42] Gang-gang Cockatoos tolerate urban areas and are known to forage on garden plants, such as exotic cypress and cotoneaster. However, urbanisation may still threaten their status in the ACT due to the loss of and competition for suitable nesting hollows.

40 Bennett, V. A., Doerr, V. A. J., Doerr, E. D., et al, 2013. *Cause of Species Reintroduction Failure*. Austral Ecology, 38(6), 700–712.
41 Bounds J., Davey C., Taws N., et al, 2021. *Long-term Trends in ACT Woodland Birds 1998 – 2019*. Prepared for Canberra Ornithologists Group.
42 ibid.

Attribution of trends in threatened bird communities and species

Attribution of causes for these declines is challenging due largely to uncertainties and limitations with available data – the surveys conducted by Canberra Ornithologists Group were never intended to inform this type of analysis. Survey locations were not selected based on their location in relation to urban areas, and details of survey methodology and frequency may have changed over time. A full statistical analysis on these has not been conducted as part of this Investigation. Nonetheless, the distribution data suggest that ecosystem conversion for urban development is not the direct cause of decline for five threatened bird species nor for the apparent decline of several other small woodland birds not listed as threatened. Declines of species discussed above (including those that are not officially threatened) are not limited to new urban development areas.

Urbanisation was not the sole driver of trends, but declines in Box-Gum Grassy Woodland and Natural Temperate Grassland species were linked to habitat loss, fragmentation and edge effects exacerbated by urbanisation. Woodland birds faced competition from urban-tolerant species, reduced nesting resources, and increased predation. Broader factors, including climate change and historical habitat degradation, further impacted biodiversity.

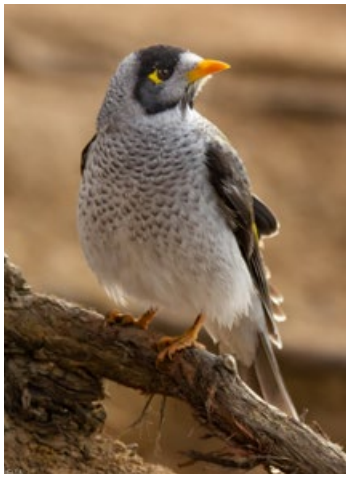
Declines in threatened species' populations in the ACT may be driven by both local factors, such as land-use changes, and broader influences, such as climate change.

Clearing and degradation of Box-Gum Grassy Woodland

Habitat loss and fragmentation from urban development are central factors contributing to the decline of woodland birds in the ACT, as they reduce critical habitat features like open understorey, mature trees, and complex ground layers needed for woodland bird communities.[43] However, these direct impacts alone likely do not fully explain the declines, which have also been observed in areas further away from development.

Box-Gum Grassy Woodlands. Source: Helen Cross

43 Garnett, S. and Baker, G. B., 2021. *The Action Plan for Australian Birds 2020.* (1 ed.) CSIRO Publishing, Clayton South; Bennett, A.F. and Watson, D. M., 2011. *Declining woodland birds – is our science making a difference?* Emu, 111(1), i–vi.



Noisy Miner. Source: Ryan Colley

Historical habitat fragmentation may contribute to continued reductions through "extinction debt".[44] It may be that past woodland clearing reduces the resilience of woodland bird populations to disturbances such as drought and fires.[45] Clearing diminishes the availability and quality of critical refuges, such as dense understorey and tree hollows, which birds rely on during extreme events. It also fragments habitats, limiting the ability of birds to move between patches to access resources or escape affected areas, thereby reducing their adaptability and survival rates. The loss of specialised and sensitive species due to habitat degradation leaves bird communities dominated by generalists, which lowers overall biodiversity and weakens ecosystem resilience. In already degraded landscapes, disturbances like drought and fires have a compounding effect, causing more severe population declines compared to intact habitats. Additionally, reduced vegetation cover exacerbates the intensity of these events by increasing exposure and limiting available resources. Taken together, these processes can continue to affect woodland bird communities long after clearing has ended or diminished[46] and give rise to an irreversible time lag in the impact of past land cover changes.

Additional factors may contribute to the declines. Small woodland birds are more likely to occur farther from urban areas in the ACT,[47,48] which may be associated with the change to composition of birds adjacent to urban areas. For example, urbanisation increases nest predation from domestic cats and urban-supported predators like ravens, leading to lower recruitment rates that cannot adequately replace adult mortality.[49] The proliferation of Noisy Miners, which aggressively exclude smaller woodland birds from accessing resources, compounds this challenge. Their over-abundance, driven by fragmented and edge habitats, is now listed as a key threatening process under the EPBC Act. In addition, Noisy Miners dominate edge environments, further restricting resources available for woodland birds.

Another key factor is competition for nesting hollows, a naturally limited resource that urban development further reduces by removing mature trees. Hollows are essential for breeding, and species tolerant of urban environments, such as Crimson Rosellas and Galahs, increasingly outcompete woodland birds for these scarce sites.

Beyond woodland birds alone, the loss of mature trees, particularly in urban areas of the ACT, is a significant issue for biodiversity. Between 2015 and 2020, almost 1,000 mature native trees (canopy >100 m² and >8 m tall) were removed in greenfield suburbs, with the majority lost in Coombs (22 per cent), Whitlam (23 per cent), Taylor (31 per cent), Throsby (35 per cent), and Wright (42 per cent).[50] A continued decline in mature trees in Canberra's urban open spaces is predicted, with substantial ecological consequences. For example,

44 Ford, H. A., Barrett, G. W., Saunders, D. A., et al, 2001. *Why have birds in the woodlands of Southern Australia declined?* Biological Conservation, 97(1), 71–88.

45 Reid, J. R. W., 1999. *Threatened and declining birds in the New South Wales sheep-wheat belt: I. Diagnosis, characteristics and management*. Prepared for the New South Wales National Parks and Wildlife Service. Available at: https://www.environment.nsw.gov.au/resources/nature/wedecliningbirdreport99reid.pdf

46 ibid.

47 Ikin, K., Knight, E., Lindenmayer, D. B., et al, 2012. *Linking bird species traits to vegetation characteristics in a future urban development zone: implications for urban planning*. Urban Ecosystems, 15, 961–977.

48 Rayner, L., Lindenmayer, D. B., Gibbons, P., et al, 2014. *Evaluating empirical evidence for decline in temperate woodland birds: a nationally threatened assemblage of species*. Biological Conservation, 171(1–3), 145–155.

49 Ford, H. A., 2011. *The causes of decline of birds of eucalypt woodlands: Advances in our knowledge over the last 10 years*. Emu – Austral Ornithology, 111(1), 1–9.

50 ACT Government, 2023. *Action Plan to Prevent the Loss of Mature Native Trees.*

a 2015 study[51] found that 29 per cent of birds in the ACT exclusively use trees >80 cm diameter at breast height (DBH). Another study[52] found that losing a single large tree (>100 cm DBH) in urban greenspace can reduce bird abundance by 91 per cent and species richness by 157 per cent. Additional research shows that the richness and abundance of insectivorous bats and birds are positively linked to the number of mature trees, while hollow-bearing trees are crucial for supporting hollow-dependent bird species within Canberra's suburbs.[53]

Dead tree in Coombs. Source: Richie Southerton

The increased frequency and severity of climate events, particularly droughts, may also play a role.[54] Species like the Diamond Firetail and Scarlet Robin demonstrate population increases during wetter periods and declines during drought, and overall trends indicate that drought may lead to population dispersal or mortality.[55] Climate change may also be amplifying the Noisy Miner's dominance. Being better adapted to open-canopy environments and capable of withstanding hotter conditions, Noisy Miners may benefit from a warming climate.

Together, these factors highlight a potentially complex interplay of habitat loss, fragmentation, predation, competition, and climate impacts in the persistent declines of selected woodland bird populations in the ACT. Limiting the loss of habitat alone may not be enough to stop the decline of these species in the short or medium term, but there is no chance of long-term species recovery if urban sprawl is not contained.

5.3.2.2 Mammals

Urban development may already impact woodland mammals directly by reducing their habitat, including mature trees and woody debris. Some species, such as the Eastern Bettong and Eastern Quoll, have gone extinct in the wild on mainland Australia; now existing only in fenced sanctuaries within the ACT. While additional habitat loss may not immediately threaten these sanctuary-protected species, it does reduce potential habitats needed for future population restoration beyond the fenced areas.

Populations of Grey-headed Flying Foxes (classed as Vulnerable) appear to be stable. Grey-headed Flying Foxes roost at a camp in Commonwealth Park (peaking at around 9,000 individuals, including mothers with pups, in summer), which is not formally protected, but they are subject to a site-specific management plan. Estimations of Grey-headed

51 Le Roux, D. S., Ikin, K., Lindenmayer, D. B., et al, 2015. *Single large or several small? Applying biogeographic principles to tree-level conservation and biodiversity offsets.* Biological conservation, 191, 558–566.

52 Stagoll, K., Lindenmayer, D. B., Knight, E., et al, 2012. L*arge trees are keystone structures in urban parks.* Conservation Letters, 5(2), 115122.

53 Gibbons, P., Wong, E. W. and Parsons, C., (in review). *A guide to retaining ecologically mature trees in new residential developments within the ACT*. Fenner School of Environment & Society, The Australian National University, October 2024.

54 Bain, G. C., MacDonald, M. A., Hamer, R., et al, 2020. *Changing bird communities of an agricultural landscape: declines in arboreal foragers, increases in large species*. Royal Society Open Science, 7(3).

55 Bounds J., Davey C., Taws N., et al, 2021. *Long-term Trends in ACT Woodland Birds 1998 – 2019*. Prepared for Canberra Ornithologists Group.

Grey-headed Flying Fox. Source: Ryan Colley

Flying-fox numbers during surveys of their camp in Commonwealth Park between 2014 and 2022[56] suggest a varying number of individuals of up to 10,000 without any obvious trends during the eight years of surveys. Recent analyses suggests that taken across their≈range, the species currently remains resilient without overall declines.[57]

The primary threat to Grey-headed Flying Foxes is from extreme heat events that result in mass mortality; this might be exacerbated by urban heat effects and the loss of vegetative cover. They are also vulnerable to indirect urban pressures such as increased visitation at the camp and the use of bird/bat netting on garden plants (which can kill flying foxes). The camp in Commonwealth Park is also susceptible to disturbance from public firework and drone displays.[58]

In the Jacka development area, a Koala was reported, despite long-standing debates about their local extinction status in the ACT. The ACT Government has initiated environmental assessments to determine the Koala's origin and the extent of its habitat use in the region.

Additionally, several species of antechinus associated with woodlands in the ACT, though not officially listed as threatened, have experienced steep declines over the last two decades. These include the Agile Antechinus, Yellow-footed Antechinus and Common Dunnart, rare carnivorous marsupials. These species, now on the verge of local extinction, have likely been impacted by urban development in the region.[59,60]

56 Australian Government, Department of Climate Change, Energy, the Environment and Water, n.d. *National Flying-fox Monitoring Viewer.* Available at: https://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf

57 Vanderduys, E. P., Caley, P., McKeown, A., et al, 2024. *Population trends in the vulnerable Grey-headed flying-fox, Pteropus poliocephalus; results from a long-term, range-wide study*. PLoS ONE 19(3): e0298530.

58 Fejer, L., 2025. *Canberra drone show start time moved later to accommodate threatened species*. ABC, published on 24 January 2025. Available at: https://www.abc.net.au/news/2025-01-24/drone-show-canberra-flying-fox-move/104854082

59 Capital Ecology, 2021. *Western Edge Investigation Area – Preliminary Ecological Review*. Prepared for the Environment, Planning and Sustainable Development Directorate, ACT Government.

60 Norris, E., Jario, N., Zhao, Y. et al, 2022. *A preliminary survey of small native mammals and their habitat at Stromlo East and West, ACT*. Prepared for the ACT Government. Available at: https://www.act.gov.au/__data/assets/pdf_file/0006/2539311/a-preliminary-survey-of-small-native-mammals-and-their-habitat-at-stromlo-east-and-west-2022.pdf

5.3.2.3 Reptiles

Populations of the three reptile species listed below are all trending down, with loss of Natural Temperate Grassland as their key threat.

The Canberra Grassland Earless Dragon is endemic to the ACT and was historically common in the region but has undergone considerable and ongoing declines, which have been attributed to habitat loss for urban and industrial development. The species was believed extinct until its rediscovery in the 1990s. It is now only found in 11 sites (with a total of 1,043 ha), and extinction risk over the next decade is moderate to high for all sites.

Since 2002, Canberra Grassland Earless Dragon populations have been monitored at nine sites (but with varying effort year to year) and demonstrate a severe decline and probably multiple local population extinctions. The largest number recorded was 208 individuals at Jerrabomberra West in 2006. This dropped sharply to 28 in 2007 and to zero in 2020. Six of the nine sites had no individuals recorded in 2020. There are likely fewer than 50 individuals in the wild. Any further grassland contraction will inevitably increase the risk of extinction.

Canberra Grassland Earless Dragon. Source: Ryan Colley

The Striped Legless Lizard occurs in four isolated populations in the ACT. They can persist in degraded grasslands under some management regimes. Most of their large populations (>200 individuals) are protected in nature reserves, except for the population in the Jerrabomberra Valley. Medium and small populations in Majura Valley and Fyshwick are unprotected. Twenty ha of Striped Legless Lizard habitat will be lost in the development of Gungahlin town centre and Kenny.

The Pink-tailed Worm Lizard is found on the slopes of the Molonglo and Murrumbidgee river corridors and adjacent outlying hills, including Mount Taylor, Cooleman Ridge, Urambi Hills, The Pinnacle and Mount Stromlo. They are found in remnant grassland with rocks, which are a key habitat feature. Urban development causes degradation of habitat (e.g. the removal of rocks) and, worse, loss of habitat for this species.

5.3.2.4 Insects

Populations of the three insect species listed below are all trending down, with loss of Natural Temperate Grassland as their key threat.

The Golden Sun Moth is associated with grassland dominated by Wallaby Grass. An estimated 1,800 ha of Golden Sun Moth habitat remains in the ACT, but most patches are <5 ha in size (with a median patch size of 2.8 ha), and their occurrence at sites can vary between years. They spend most of their lifecycle as larvae in the roots of grasses and only emerge and fly as adults for a few days. Development can kill larvae in the soil. Of their remaining habitat, 22 per cent is approved or proposed for urban development.

180 ha of Golden Sun Moth habitat (comprising 34 ha in grassy woodland and 146 ha in exotic pasture) will be lost under the Gungahlin development proposals, largely in the new suburbs of Taylor and Moncrieff. A further 23 per cent of their remnant habitat in the ACT is on Commonwealth land with an uncertain future.

Keys Matchstick Grasshopper. Source: Hannah Zurcher

Key's Matchstick Grasshopper is associated with tall *Themeda* grassland with native daisies (notably *Asteraceae*, a key food plant) where disturbance is low, such as railway corridors and cemeteries, as well as some travelling stock reserves and nature reserves. Its area of occurrence has massively shrunk, partly due to the loss of grassland for urban development.

The Perunga Grasshopper occurs in the ACT and surrounding NSW across a small range stretching 180 km east–west and 150 km north–south. It remains widespread but patchily distributed in remnant grassland in the ACT.

5.3.2.5 Plants

Ginninderra Peppercress is endemic to the ACT and only found in the Lawson and Franklin grasslands. Its primary threats are urban development and grassland management (e.g. for visitor activities).

The Small Purple-pea used to be widespread in south-eastern Australia in woodland and associated grasslands but has declined due to clearing for agriculture and urban development. Some ACT populations are known to have become extinct (e.g. cleared for the suburb of Mawson). The largest ACT population is in Mt Taylor Nature Reserve, which fluctuates with climate but is generally increasing. The suburban population in Kambah is declining. Reintroduction efforts over recent years have, however, resulted in the establishment of a number of new populations.

Button Wrinklewort. Source: EPSDD

Button Wrinklewort occurs at 11 sites, and its ACT abundance is critical to its national status, with some of the largest and most viable populations.[61] The largest Button Wrinklewort population occurs at Gurubang Dhawura (52 ha remnant Box-Gum Grassy Woodland), with an estimated 49,000 individual plants. Gurubang Dhawura is on National Capital Authority land, and its future is uncertain, with the potential that the site could be developed for diplomatic estates (e.g. embassy or new Prime Minister's lodge).

Canberra Spider Orchid. Source: Emma Cook

The Canberra Spider Orchid is endemic to the ACT and is only found at Mt Ainslie, Mt Majura, the Majura Valley (Department of Defence land) and Kowen Escarpment Nature Reserve. Its range and population size have contracted due to urban development and woodland loss. Two populations became extinct due to woodland clearing for the suburb of Aranda. This species is not currently found in urban areas or proposed urban areas, but urban development could reduce the area of potential habitat for the species (translocations to establish new populations are proposed as part of the *Canberra Spider Orchid (Caladenia actensis) Action Plan*[62]).

The Tarengo Leek Orchid occurs at a single site in the ACT, at Hall Cemetery, meaning it is vulnerable to stochastic events such as fire, which could destroy the entire population. The Hall area is currently rural zoned, but potential rezoning and urban development in the area could exacerbate risk to the population due to indirect effects such as weed incursion and increased human disturbance.

The Hoary Sunray is not listed in the ACT but has special protection status due to its Federal Endangered listing. Out of 30 subpopulations in the ACT, 20 occur in nature reserves – the other 10 could be impacted by development. It is currently widespread in the ACT but is sensitive to degradation.

The threatened flora species in river corridors listed below are not directly impacted by urban development but are potentially impacted by increased foot traffic, runoff, sedimentation and pollution.

Murrumbidgee Bossiaea is endemic to the ACT and only occurs in rocky outcrops in the riparian zone of the Murrumbidgee and its tributaries. Sub-populations in the Molonglo River valley may already have gone extinct; certainly, additional pressure will contribute to population fragmentation.

Tuggeranong Lignum is endemic to the ACT, extremely rare (only 11 known plants) and only occurs on flood terraces on the eastern bank of the Murrumbidgee River near Tuggeranong. It is impacted by physical disturbances, including trampling, which may increase with population growth.

61 ACT Government, n.d. *Button Wrinklewort (Rutidosis leptorhynchoides).* Available at: https://www.act.gov.au/environment/animals-and-plants/act-threatened-species/button-wrinklewort-rutidosis-leptorhynchoides

62 ACT Government, Environment, Planning and Sustainable Development Directorate, 2019. *Canberra Spider Orchid (Caladenia actensis) Action Plan*. In ACT Native Woodland Conservation Strategy and Action Plans, p. 154–162.

The ongoing decline and high extinction risk of the grassland species discussed throughout this section highlights the overriding importance of habitat loss and fragmentation and development on the ACT's grassland ecosystems.

5.3.3 Ecological impacts of future development

Future urban developments pose additional risks to biodiversity and ecological integrity. They currently include the new Gungahlin developments and potentially areas beyond Canberra's western edge, as well as possible impacts of specific infill developments within existing suburbs. Chapter 7 provides an in-depth examination of current and proposed developments to Canberra's west.

The proposed developments in Gungahlin are expected to lead to significant impacts on critically endangered ecosystems and the species that rely on them. Currently, the approved removal of Box-Gum Grassy Woodland in this area amounts to 126 ha. While much of the high-quality Box-Gum Grassy Woodland is already protected within the reserve network, areas of low to moderate-quality woodland will be cleared. Despite being lower in quality, these woodlands still provide important habitat for some threatened species (possibly including the Koala sighted at the future suburb of Jacka in late 2024). The loss of these areas may also deteriorate the ecological function of the reserves due to urban encroachment and edge effects. This degradation could have negative consequences for threatened species within the reserve network. For example, Superb Parrots that nest on Sammy's Hill, near the new suburb of Throsby, may be affected by these changes.

In addition to the loss of Box-Gum Grassy Woodland, Natural Temperate Grassland will also be cleared. This will result in direct mortality for threatened species within these grasslands, including the destruction of plants and the death of reptiles and invertebrates. Indirect impacts are also anticipated, such as reduced population sizes and potential isolation, which could lead to genetic deterioration in these species. Threatened grassland fauna that are likely to be impacted include the Golden Sun Moth, Pink-tailed Worm Lizard and Striped Legless Lizard.

The potential impact of future greenfield developments in the ACT depends significantly on spatial and other details in the development plans, which currently are not available. However, there have already been several initial investigations[63,64] into the identified areas that together provide a picture of potential impacts and ways in which these can be avoided. Key points arising from those studies identify many of the threats detailed throughout this chapter, including habitat loss, habitat fragmentation, edge effects, aquatic and riparian impacts, urban reserve degradation and loss of remnant habitats from poorly considered infill development.

Mitigating these impacts requires habitat protection, maintaining connectivity, managing invasive species and minimising edge effects to sustain biodiversity in the face of development.

63 ACT Government, Planning, n.d. *Western Edge Investigation*. Available at: https://www.planning.act.gov.au/projects-priorities/western-edge-investigation

64 ACT Commissioner for Sustainability and the Environment, 2020. *Independent Audit of the Molonglo Valley Strategic Assessment.*

6

The Southern Broadacre Area

Callum Brae and Jerrabomberra West Grassland Reserve. Source: John Evans

6. The Southern Broadacre Area

This chapter illustrates some of the complexities described in Chapter 4 in relation to planning and nature conservation policy with real-world examples from the Southern Broadacre Area of the ACT. This area has been the subject of various studies and conservation interventions over the course of the study period, but the extent to which this can be deemed successful is not immediately clear. This area now falls within the current Eastern Broadacre Strategic Assessment Area which is being considered for future urban expansion, so its future remains uncertain. Significantly, this part of the ACT is a stronghold for the last remnants of the Territory's critically endangered Natural Temperate Grassland.

It is not the intent of this report to interrogate or revisit previous planning decisions, simply to document what those decisions were and explore their environmental outcomes.

As outlined in Chapter 4, 15 per cent of the ACT is farmland, and significant sections of this land are in the Majura and Jerrabomberra districts. The lack of an agricultural policy and clear direction for farming in the ACT, as well as a lack of decision-making on land use issues that impact agricultural leases, continues to cause uncertainty and concern amongst rural landholders.

View south into Jerrabomberra West Grassland Reserve. Source: John Evans

6.1 The Southern Broadacre Planning Study

The Southern Broadacre Planning Study[1] was undertaken in 2004 in response to the *Canberra Spatial Plan*, which identified a north–south corridor from Majura Valley through to Symonston and the Jerrabomberra Valley as a "major employment corridor" for the growth of industrial, broadacre commercial, tourism, recreation and transport–related activities over the longer term.[2]

The *Canberra Spatial Plan* was touted as the strategic planning document for the development of Canberra over the 30 years from 2004, and recognised the importance of the ACT's rural setting and its primary use for agricultural purposes.

One of the objectives of the *Canberra Spatial Plan* was to "provide opportunities for key businesses established in the ACT to grow further", with a goal for "agriculture and forestry [to] be supported in areas where sustainability principles are met."[3] Excerpts of the objective are outlined below:

> Agricultural and forestry industries are recognised as assets for the ACT and surrounding NSW and elements of the local economy that provide opportunities for further growth related businesses.
>
> Action: Further investigate and identify the range of uses that would be compatible with, and safeguard, agricultural industries including forestry and the landscape setting of the national capital.
>
> Outcome:
>
> - Adequate opportunities for the agricultural industry to grow
> - Retention of substantial agricultural areas as part of Canberra's landscape setting.

This approach demonstrated a clear commitment to the ongoing presence of agriculture in the ACT. The *Canberra Spatial Plan* was superseded in 2008, and a longer–term plan for the agricultural sector was abandoned.

The Southern Broadacre Planning Study was informed by the objectives of the *Canberra Spatial Plan* and a range of previous studies, including scoping and planning studies that had proposed options for the future use of the Jerrabomberra Valley. The Southern Broadacre Planning Study covered the area shown in Figure 6.1.[4]

1 SMEC Australia and McCann Property and Planning, 2005. *Southern Broadacre Planning Study*. Prepared for the ACT Government.
2 ACT Government, 2004. *The Canberra Spatial Plan*, p.50.
3 ibid, p.54.
4 SMEC Australia and McCann Property and Planning, 2005. *Southern Broadacre Planning Study*. Prepared for the ACT Government, Figure 1.1.

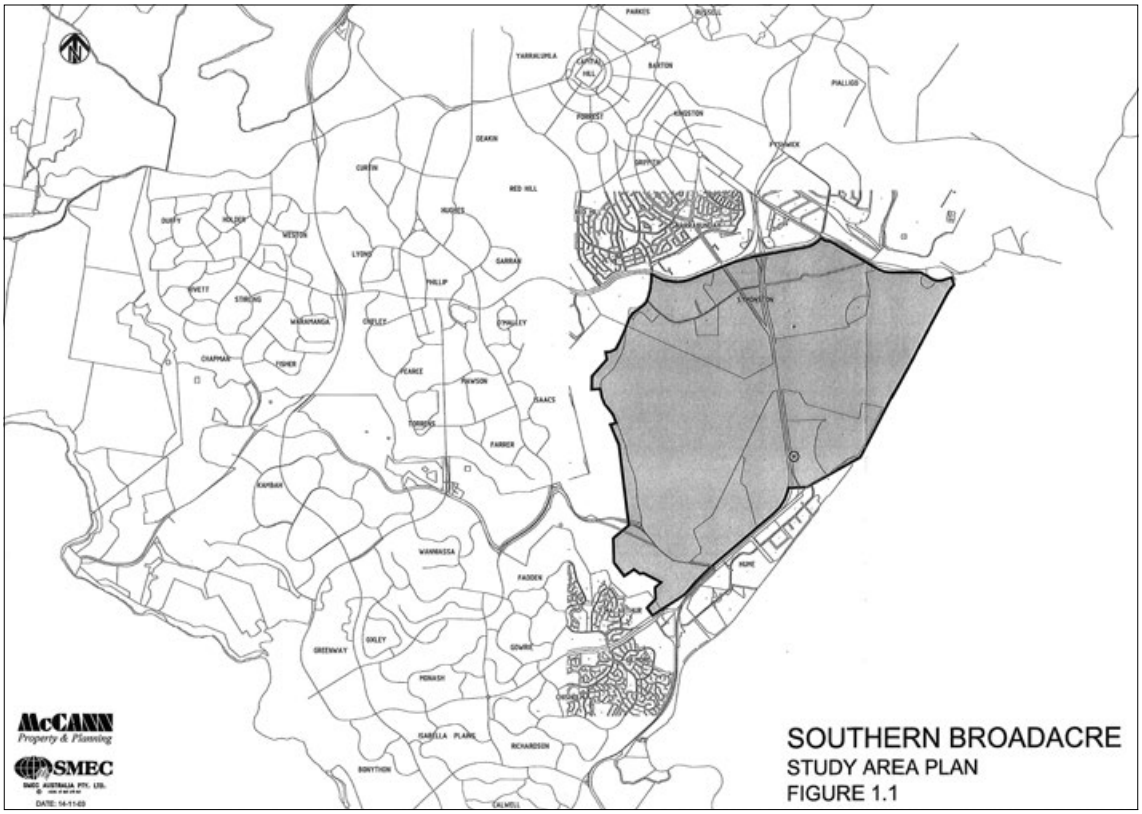


Figure 6.1. Southern Broadacre Study Area Plan.
Source: Derived from map by SMEC and McCann Property and Planning

The Southern Broadacre Planning Study's aim was to "develop the environmental, planning and engineering requirements for the land-use structure of the area."[5] As part of the broader context of the Southern Broadacre Planning Study, the report noted "pressure from rural lessees for more certainty of land tenure to enable them to invest in longer term solutions to resolve farm and environmental management issues."[6] It showed the lease lengths for the properties within the study area, with one property being on a quarterly lease, seven other properties having a lease that would run out within one year of the study, and only five properties with an extended lease to 2020.[7]

However, the Southern Broadacre Planning Study also notes that "the original planning intentions of the site were for its development as the next town centre for the ACT. The draft Jerrabomberra Scoping Study (2000) identified that the development of the valley was constrained by a combination of ecological, cultural and physical factors."[8]

5 ibid, p.1–1.
6 ibid, p.2–7.
7 ibid, Figure 2.1.
8 ibid, p.1–1.

In 2005, the majority of the Southern Broadacre Planning Study area was identified in the Territory Plan as Broadacre Land Use Policy, focused on the rural landscape setting to ensure that development would not adversely impact on the environmental quality of the area. However, the Territory Plan also required any development and use of the land to not undermine any future use of the land which may be required for urban or other purposes.[9]

The Southern Broadacre Planning Study also noted that "a rapid increase in residential land prices in Canberra and the region in the last few years, reflecting high levels of demand for land, has had effect of making all development opportunities more financially attractive."[10] Whether development opportunities should be undertaken on the basis of financial attractiveness is not addressed by the Southern Broadacre Planning Study.

Canberra Grassland Earless Dragon.
Source: ACT Parks and Conservation Service

The Southern Broadacre Planning Study noted the presence of Box Gum Grassy Woodland in the study area,[11] along with the Grassland Earless Dragon[12] and Natural Temperate Grassland, and a number of other threatened species.[13] It proposed a number of "creative conservation opportunities" including enhancement of Grassland Earless Dragon habitat, rehabilitation of a grassland corridor, and the potential for the creation of a lake in the area. It notes, "From a purely ecological perspective, it would not be difficult to make a case for protecting the whole of the area, or at least a majority of it, as a woodland and grassland reserve",[14] but goes on to say that the feasibility of such protection would be unlikely for social and economic reasons.

As such, despite the ecological importance of the areas noted in the Southern Broadacre Planning Study alongside existing land uses, it considers that the balance of the land in the study area to be "urban capable", meaning suitable for "a range of development options including residential, commercial/office or light industrial".[15] The Potential Land Use section of the report makes reference to several areas as "land banks" and included remarks on the suitability of the areas for future development. It also identifies some areas as "under developed".[16] This reliance on rural areas as land banks, and framing the land only with regard to its future potential for development, creates significant concern for leaseholders in terms of their ongoing ability to effectively plan for their future.

9 ACT Government, 2008. *Territory Plan 2008 (ACT).*

10 SMEC Australia and McCann Property and Planning, 2005. *Southern Broadacre Planning Study*. Prepared for the ACT Government, p.2–7.

11 At the time of the Southern Broadacre Planning Study, "Yellow Box – Red Gum Grassy Woodland" was listed as Endangered under the *Nature Conservation Act 1980*. This ecological community is now encompassed by "White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland", listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*. See Australian Government, Department of Climate Change, Energy, the Environment and Water, 2023. *Approved Conservation Advice for the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.
Available at: https://environment.gov.au/biodiversity/threatened/communities/pubs/43-conservation-advice.pdf

12 The Grassland Earless Dragon was listed as Endangered under the EPBC Act and the *Nature Conservation Act 1980*. In 2018, the species was split into four species, with the Canberra Grassland Earless Dragon then listed as Critically Endangered under the EPBC Act and *Nature Conservation Act 2014*. See ACT Government, n.d. *Canberra Grassland Earless Dragon (Tympanocryptis lineata).* Available at: https://www.act.gov.au/environment/animals-and-plants/act-threatened-species/canberra-grassland-earless-dragon-tympanocryptis-lineata

13 SMEC Australia and McCann Property and Planning, 2005. *Southern Broadacre Planning Study*.
Prepared for the ACT Government, p.3–9.

14 ibid, p.3–10.

15 ibid, p.4–1.

16 ibid.

Expert comment

Conserving grassy ecosystems amidst urban expansion

Professor Jamie Pittock, Fenner School of Environment & Society, Australian National University

Grassy ecosystems are among the most endangered in Australia and they are home to many of the ACT's most endangered species. Here, the challenges and opportunities to conserve these ecosystems and benefit Canberrans as our city develops are outlined.

Challenges for grassy ecosystem conservation in Canberra

a. Planned urban expansion

Several thousand hectares of critically endangered grassy ecosystems remain outside conservation reserves and at risk from urban expansion. The key areas of greatest conflict are over grasslands in the Majura Valley and grassy woodlands in the Molonglo Valley. Smaller, high conservation value sites are also at imminent risk from urban development and poor management.

In 2014, the Australian and ACT governments agreed to a strategic assessment under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to support economic and growth and development in the Eastern Broadacre area of the ACT.[17] Strategic assessments consider proposed development impacts on matters of national environmental significance on a broad scale. Projects or activities covered by an approved strategic assessment do not need individual approval. The Eastern Broadacre covers the eastern edge of the ACT from the Majura Valley in the north to Hume in the south and includes Symonston and the Jerrabomberra Valley. It is unclear from publicly accessible reporting why this strategic assessment has not progressed.

In 2022–23 the ACT Government commenced consultation on a draft East Canberra District Strategy under ACT planning legislation (that appears to mirror the Eastern Broadacre geographic area).[18] While one of five strategy drivers is stated as "Protect, conserve, and enhance priority grassland, woodland and aquatic habitats and environmental values," it is unclear how this would be achieved given the other four drivers for economic development are earmarked for extensive "possible change areas" that are habitat for Natural Temperate Grassland, and species like the critically endangered Canberra Grassland Earless Dragon. Proposed "environmental conservation" areas are limited to the southern third of the area.

Similar draft district strategies for Belconnen and Molonglo Valley[19] propose "change areas" for future urban development that may impact on smaller areas of Natural Temperate Grassland and Box-Gum Grassy Woodland in areas such as North Lawson, Bruce and along the Molonglo River corridor.

17 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2024. *Eastern Broadacre strategic assessment*. Available at: https://www.dcceew.gov.au/environment/epbc/approvals/strategic-assessments/act-eastern-broadacre

18 ACT Government, 2023. *Draft East Canberra District Strategy*. Available at: https://yoursayconversations.act.gov.au/act-planning-review/draft-east-canberra-district-strategy

19 ACT Government, n.d. *Draft District Strategies*. Available at: https://yoursayconversations.act.gov.au/act-planning-review/draft-district-strategies

Extensive areas of remaining grassy ecosystems lie on lands managed by the Department of Defence, and, to a lesser extent, by other Commonwealth agencies. These habitats need protection against future land use changes. One option would be agreements by landholders drawing on the new, global initiative for Other Effective area-based Conservation Measures,[20] to manage the land for conservation as a secondary use to the current primary purpose.

b. Secondary development impacts

Urban development directly destroys grassy ecosystems. There are then a number of serious, secondary impacts on adjoining areas of surviving habitat. To protect development from bushfires, current ACT practice is to regularly clear vegetation in Inner Asset Protection Zones of up to 60 m wide on northern and western boundaries. This disturbance can damage habitat and enable weed invasion. Similarly, drainage off urban areas into grassy habitats increases influxes of nutrients, water and invasion of ecosystem transforming weeds, such as the grass *Paspalum*. Disturbance by urban development and planting of ornamental weeds (such as Blue Periwinkle and Agapanthus) generates populations of invasive species that are tracked into adjoining habitats by wind, water, animals and people. Lastly, significant grassy ecosystem remnants are at risk of being fragmented by urban developments into smaller patches at greater risk from weed invasion, predation of wildlife and loss of animals crossing roads. Examples include the proposed northern road at Canberra Airport and the North Lawson housing development. These impacts illustrate the importance of good land use planning to protect large areas of remaining habitat.

c. Management of habitats

The trend for government agencies to contract out land management work rather than employ permanent staff exacerbates degradation of publicly owned grasslands from weed invasion and poor biomass management. Agencies contracting out management include Defence, the National Capital Authority and City Services.

Publicly employed rangers tend to build up extensive knowledge of the lands that they manage and can respond on a day-to-day basis to seasonal changes. For example, rangers can spray invasive weeds like African lovegrass and St John's Wort that respond to rainfall on a week by week basis over the warmer months. By contrast, it takes time to approve weed spraying by contractors and budgets are capped, meaning that windows to control weeds are often missed. Further, optimum weed control is achieved when rangers on a day–to–day basis are spot spraying small remnant infestations, rather than awaiting the few times per year when contractors are available.

Themeda (Kangaroo Grass). Source: OCSE

20 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2024. *National Other Effective area-based Conservation Measures (OECMs) Framework*. Available at: https://www.dcceew.gov.au/environment/land/achieving-30-by-30/conserved-areas/national-oecms-framework

The use of fuel reduction burns to maintain grass biomass to the modest levels needed to sustain populations of wildflowers (forbs) and fauna of grassy ecosystems is resource intensive. The ACT Rural Fire Service plays an important, positive role for conservation by undertaking training and fuel reduction burns on lands outside reserves, including national lands at Acton Peninsula, Gurubung Dhaura (Stirling Park), and Yarramundi Reach. However, the extensive planning required and reliance on volunteers on the limited available weekends in the autumn ecological burning window is problematic. The default option of mowing and slashing grassy ecosystems through poor mower hygiene is spreading weed grasses across the greater urban area. Unfortunately, there is also at least one example of where change of management from a rural leasee undertaking conservative livestock grazing and systematic weed control that sustained threatened species to an offset reserve has resulted in poorer management of infestations of African Lovegrass and St John's Wort.

Opportunities for grassy ecosystem conservation in Canberra

There are a number of ways in which Canberra could be an exemplar for conserving threatened biodiversity and enabling sustainable urban development, including:

Better planning

Proactively identifying and reserving for conservation the remaining high conservation value grassy ecosystems could streamline approvals for development on low conservation value lands and eliminate the need for offsetting. The area of high conservation value habitats that remain unprotected in the urban area of Canberra are only in the order of several thousand hectares. Previous joint ACT and Commonwealth government strategic assessments for Gungahlin, Molonglo Valley and West Belconnen have seen important habitats reserved while enabling better urban developments.

A biodiversity network

Effective conservation of grassy ecosystems in greater Canberra requires coordinated work across land tenures. In other states, conservation networks at the landscape scale have been formed by public and private land managers, such as the Northern Plains Conservation Management Network in Victoria.[21] In the ACT, Friends of Grasslands and the Conservation Council are advocating for a "biodiversity network" to maximise biodiversity conservation across land tenures in the ACT.[22] Conservation of grassy ecosystems would be greatly improved in the ACT if such networks were established in key regions across land managed by the ACT Government (including urban open space and road and power easements), rural and urban leases, as well as on Commonwealth land (especially Department of Defence lands). Inclusion of land in a conservation network would enable compatible uses to continue, so that the cost of management would be minimised and conservation would be supported with advice and some facilitation by a team of ecological managers.

21 Northern Plains Conservation Management Network, 2025. *Northern Plains Conservation Management Network*. Available at: https://www.facebook.com/northernplainscmn/

22 Conservation Council ACT Region, 2023. *A Biodiversity Network for the ACT*. Available at: https://conservationcouncil.org.au/blog/2023/01/13/a-biodiversity-network-for-the-act/

More resources for management

Grassy ecosystems require expensive active management to remain healthy. All potential sources of management resources need to be explored. Additionally, skilled practitioners who can lead implementation of management to achieve ecological outcomes are required.

The recent passage of the *Commonwealth Nature Repair Act 2023* raises the possibility of increased funding for conservation on lands outside nature reserves.[23] However, the ACT leasehold tenure system may be a barrier to provision of benefits for rural land managers. The current review of the ACT Nature Conservation Act should consider how managers of grassy ecosystems can maximise income from payments for ecosystems services, such as carbon sequestration and biodiversity conservation.

The establishment of biodiversity networks generates opportunities to share resources and reduce costs, for example, with weed control and controlled burning. It creates opportunities for land managers to better express the case for increased private and public funding.

6.2 Establishment of nature reserves

Despite the focus on future development options, key in the outcomes of the Southern Broadacre Planning Study was that the Callum Brae Nature Reserve (143 ha) and the Jerrabomberra West Grassland Reserve (261 ha) were created by resuming parts of the Callum Brae farm. These reserves were created in order to protect the native woodland and grassland (respectively) in the area, being identified as high conservation status area as part of the ACT Lowland Woodland Conservation Strategy.

Callum Brae Nature Reserve sign at the Narrabundah Lane entrance. Source: John Evans

The process for the establishment of the nature reserves appears to have occurred directly through an exchange of letters between Ministers. At the time, s 192 of the *Land (Planning and Environment) Act 1991* allowed for the Conservator to recommend to the land and planning authority that the Territory Plan be varied to create a reserve.[24] Note that while the following information has been gleaned from ACT Government records provided to OCSE and those publicly available, it does not necessarily form a complete picture of the processes undertaken to establish Callum Brae Nature Reserve.

23 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2024. *Nature Repair Market*. Available at: https://www.dcceew.gov.au/environment/environmental-markets/nature-repair-market

24 ACT Government, 2008. Land (Planning and Environment) Act 1991, Republication No 39, Division 5.7, Subdivision 5.7.2.

Table 6.1. Timetable for the establishment of Callum Brae Nature Reserve

Date	Comments
6 May 2003	The Chief Minister and Minister for the Environment announced $1.671 million for the protection of grassy woodlands in the ACT, including 300 ha at Callum Brae.[25] At this stage, the boundary for the extent of the reserve had not yet been decided and was still subject to discussions.[26]
14 Jul 2004	Over a year later, the Minister for the Environment sought the approval of the Acting Minister for Planning for the name of the new nature reserve to be "Callum Brae Nature Reserve".[27] This approach appears to be based on the *draft* Southern Broadacre Planning Study, although this is not referred to in the letter.
20 Jul 2004	A Ministerial brief to the Acting Minister for Planning outlined the draft findings of the Southern Broadacre Planning Study, and presented next steps.[28] This was provided *after* the Minister for the Environment had sought to create the new Callum Brae reserve.
22 Jul 2004	The Minister for the Environment publicly announced the creation of the Callum Brae Nature Reserve,[29] and two (unnamed) grassland reserves.[30] The announcement does not contain any information on additional resourcing or support to be provided to manage the reserves.
27 Jul 2004	The Minister for the Environment again wrote to the Acting Minister for Planning, seeking declaration of new nature reserves in the Jerrabomberra Valley. Again, this is *after* a public announcement of the reserves had taken place.[31]
1 Sep 2004	The Minister for Planning wrote to the Minister for the Environment, outlining the process and timing for the formal declaration of the reserves.[32]
20 Sep 2004	The Minister for Planning signed a briefing on the Southern Broadacre Planning Study, noting the comments on the draft study and options for a media release.[33]
Undated	An undated draft media release announcing the finalisation of the Southern Broadacre Planning Study outlined that the Jerrabomberra Valley "was not suitable for broadscale residential development because it threatened significant environmental values in the area".[34]
10 Mar 2005	The Minister for Planning signed a briefing on the final report on the Southern Broadacre Planning Study, its findings, and the intention to progress a Draft Variation to the Territory Plan and an amendment to the National Capital Plan to formally implement the findings of the study.[35] However, it is not until 2008 that the Callum Brae Nature Reserve first appears on the Territory Plan.[36]

25 ACT Government, 2003. *2003–2004 Budget – Protecting Our Grassy Woodlands*. Media release, 6 May 2003. Available at: https://www.treasury.act.gov.au/__data/assets/pdf_file/0011/1471592/media_26.pdf
26 Sharp, S., Higginbotham, P., Klaver, J., et al, 2003. *'Callum Brae' Reserve Boundary*. Meeting notes, 16 December 2003.
27 Stanhope, J., 2004. *Re: Proposed name for the new Nature Reserve at Callum Brae*. Letter, 14 July 2004.
28 ACT Government, ACT Planning and Land Authority, 2004. *Southern Broadacre Planning Study*. Ministerial brief, 20 July 2004.
29 Stanhope, J., 2004. *New Nature Reserve at Callum Brae*. Media release, 22 July 2004.
30 Stanhope, J., 2004. *Chief Minister Announces Two New Grassland Reserves in Jerrabomberra Valley*. Media release, 22 July 2004.
31 Stanhope, J., 2004. *[No subject]*. Letter, 27 July 2004.
32 Corbell, S., 2004. *[No subject]*. Letter, 1 September 2004.
33 ACT Government, ACT Planning and Land Authority, 2004. *Southern Broadacre Planning Study*. Ministerial brief, 20 September 2004.
34 Corbell, S., n.d. *Draft Only – Future Planning Directions for Jerrabombera* [sic] *Valley Balance Development with Conservation*. Draft media release, unpublished.
35 ACT Government, ACT Planning and Land Authority, 2005. *Southern Broadacre Planning Study*. Ministerial brief, 10 March 2005.
36 ACT Government, 2008. *Territory Plan 2008 (ACT)*.

6.3 Callum Brae

The Callum Brae rural property and farm dates back to the early 1900s. A number of soldiers returning from World War I were awarded separate leases over parts of the broader property, with land then changing hands over the years as a result of economic and lease constraints. Eventually, the property was sold to Andrew McMaster in 1958, and the property has remained in the family ever since.[37] The leaseholders had maintained a significant portion of the natural woodland and grassland over time.

Callum Brae farm on the left, with the Callum Brae Reserve across the fence on the right. Source: OCSE

Callum Brae Nature Reserve

The ACT Government resumed parts of Callum Brae as a result of its high conservation value and committed funding to maintain the reserve. At the time the reserves were announced, the ACT Lowland Woodland Strategy[38] had been introduced and guided the conservation of those areas with Box Gum Grassy Woodland .

In 2011, a draft Symonston Grassland Earless Dragon Survey Consultancy Brief noted:[39]

> *In March 2009, the then-ACT Commissioner for Sustainability and the Environment released the Report on ACT Lowland Native Grassland Investigation. This report further analyses Action Plan 28 and identifies some possible gaps in the ecological information on hand for the Symonston area. The report claims that in determining how best to strategically protect Natural Temperate Grassland (NTG) and associated threatened species, additional studies are needed at Callum Brae – site boundaries and areas of ecological connectivity need to be defined; and Cookanalla – to identify whether the ecological values of the area have changed given the area was recently affected by drought.*

37 Callum Brae, 2022. *Callum Brae – A Family Operated, Heritage Listed Rural Property Celebrating the Birth of the Nation's Bush Capital and Its Future.*

38 ACT Government, 2004. *ACT Lowland Woodland Conservation Strategy 2004.* Available at: https://www.fotpin.org.au/docs/ACT_Lowland_Woodland_Conservation_Strategy_2004.pdf

39 ACT Government, Environment and Sustainable Development, 2011. *Symonston and Jerrabomberra – Grassland Earless Dragon Survey and Vegetation Condition Assessment – Consultancy Brief.*

The fact that site boundaries were identified as an issue five years after the announcement of the reserve is a concern.

Research update 2014/4: Longitudinal study of groundcover flora condition in select grassy ecosystem sites[40] describes "overall species richness and the Floristic Value Score increased between 2009 and 2012, but remained relatively stable between 2012 and 2013 with decline of almost 50 per cent in exotic species richness", showing a decrease in introduced species in that time period. However, it then goes on to say that "Between 2013 and 2014 native species richness remained stable, although exotic species richness increased by over 30 per cent".[41] These figures demonstrate that there is relatively fast fluctuation in the vegetation condition of the reserve over time. The reasons for this are not explored in the report.

Two years later, *Research update 2016/01: Longitudinal study of groundcover flora condition in select grassy ecosystem sites*[42] revisits Callum Brae Nature Reserve and shows a "relatively stable" native species richness, but a moderate increase in exotic species richness in 2013–14.

The Office of Nature Conservation provided information on long-term vegetation monitoring plots (since 2009), weed control, and pest animal control figures, including kangaroo management. These align with the reports above, with changes in native species diversity and native cover ratio fluctuating over time.

The 2015 Callum Brae Nature Reserve Information Sheet[43] notes that the northern section of the reserve is in "good" condition, and the southern part in "moderate" condition, but does not provide information on management plans.

The link track between Callum Brae and Jerrabomberra West Nature Reserves. Source: John Evans

40 Vivien, L. and Baines, G., 2014. *Research update 2014/4: Longitudinal study of groundcover flora condition in select grassy ecosystem sites*. Prepared for the ACT Government.

41 ibid, p.27.

42 Cook, E. and Wilson, N., 2016. *Research update 2016/01: Longitudinal study of groundcover flora condition in select grassy ecosystem sites*. Prepared for the ACT Government.

43 ACT Government, 2015. *Callum Brae Nature Reserve – 2015.*

The *Yellow Box – Blakeley's Red Gum Grassy Woodland Endangered Ecological Community Action Plan*[44] sets out the plan for the conservation of this Threatened Ecological Community, but only refers to Callum Brae (and other reserves) once.

The *ACT Lowlands Conservation Strategy Progress Report 2018*[45] states that Callum Brae Nature Reserve was established in 2006 through the creation of nature reserve overlay boundaries, two years after the announcement of the creation of the reserve (but two years before it appears on the Territory Plan). The Progress Report noted that the "Restore ACT and Greater Goorooyarroo Woodlands – Biodiversity Fund" restored a woodland block in Callum Brae Nature Reserve, however, it is unclear why this would be needed for a reserve that had been protected since the early 2000s. There is no other specific information in this progress report that pertains to Callum Brae Nature Reserve.

The *2021 Canberra Nature Park Reserve Management Plan* is the current policy guiding management of Callum Brae Nature Reserve.[46] This plan states that Callum Brae Nature Reserve was protected in 2008, in line with the Territory Plan, but it is unclear why the date keeps changing in ACT Government documents.

The Reserve Management Plan outlines improvements in connectivity between Callum Brae and the broader ACT as part of a wider woodland restoration plan, but that soil and erosion were an issue for Callum Brae (from a 2011 report[47]). The management goal for the reserve is:

> *"to conserve and rehabilitate the structure and condition of vegetation and to maintain connectivity with other woodland areas to ensure there is ongoing viable habitat for threatened and declining woodland birds."*[48]

Again, there is an aim to improve the condition of the reserve, which has been protected for over 20 years. The Reserve Management Plan does not explain why the condition of the reserve requires rehabilitation after so many years as a reserve.

Feral pig damage in Callum Brae Nature Reserve.
Source: OCSE

The Standing Committee on Planning, Transport and City Services' 2021 Report into the Draft Reserve Management Plan: Canberra Nature Park[49] recommends additional resourcing and improved monitoring and reporting.

Overall, the monitoring and management shows limited internal oversight of the state of the reserve, with a shift toward a more generic management plan as part of the broader Canberra Nature Park Management Plan. However, pests such

44 ACT Government, Environment, Planning and Sustainable Development Directorate, 2019. *Yellow Box – Blakeley's Red Gum Grassy Woodland Endangered Ecological Community Action Plan*. Available at: https://www.act.gov.au/__data/assets/pdf_file/0004/2545942/yellow-box-blakelys-red-gum-grassy-woodland-action-plan-2019.pdf

45 ACT Government, 2018. *Woodlands for Wildlife: ACT Lowland Woodlands Conservation Strategy – Progress Report 2018*. Available at: https://www.act.gov.au/__data/assets/pdf_file/0008/1333952/act-lowlands-woodlands-conservation-strategy-progress-report-2018.pdf

46 ACT Government, 2021. *Canberra Nature Park – Reserve Management Plan 2021*. Available at: https://www.act.gov.au/__data/assets/pdf_file/0006/2547501/canberra-nature-park-reserve-management-plan-2021.pdf

47 Sharp, S. B., 2011. *Landscape function in Canberra Nature Park and impacts on threatening processes on landscape function*. Prepared for the ACT Commissioner for Sustainability and the Environment.

48 ACT Government, 2021. *Canberra Nature Park – Reserve Management Plan 2021*, p.210. Available at: https://www.act.gov.au/__data/assets/pdf_file/0006/2547501/canberra-nature-park-reserve-management-plan-2021.pdf

49 ACT Government, 2021. *Report 2 – Standing Committee on Planning Transport and City Services – Draft Reserve Management Plan: Canberra Nature Park*. Available at: https://www.parliament.act.gov.au/__data/assets/pdf_file/0011/1804826/PTCS-Report-2-Draft-Reserve-Management-Plan-Canberra-Nature-Park.pdf

as blackberries, Paterson's curse, and feral pigs persist within Callum Brae Nature Reserve, despite the best efforts of rangers to reduce pest species across Canberra Nature Park.

The Callum Brae Nature Reserve provides a clear example of land use change – from farming to nature reserve – with aims to protect the remnant woodland, but with outcomes that are less than ideal.

6.4 The future of the Southern Broadacre Study Area

Since the Southern Broadacre Study, the Government began the process of identifying opportunities for development in what is now called the Eastern Broadacre area through the Eastern Broadacre Strategic Assessment, a landscape-scale assessment under the EPBC Act.[50] A significant portion of the study area overlaps with the Southern Broadacre Study, including Callum Brae Nature Reserve and the Callum Brae property (Figure 6.2).

The Eastern Broadacre Strategic Assessment follows the ACT Eastern Broadacre Planning Study in 2010, and the ACT Planning Strategy 2018.[51] It is also guided by the East Canberra District Strategy,[52] which recognises the rural character of the area, but sets out a strategy to 2050 which includes new employment precincts, small new residential areas (including potential Indicative Land Release Program involvement), and a focus on economic diversification. However, the extent to which these aspects are considered in the Eastern Broadacre Strategic Assessment is unknown. According to the ACT Government, the Eastern Broadacre Strategic Assessment will be available for public consultation in 2025.[53]

The legacy of the Broadacre Land Use Policy, and similar policies contained within the current Territory Plan,[54] is such that several rural leaseholders OCSE spoke to felt that their land was a land bank for future urban use. This is borne out in the Southern Broadacre Planning Study, which uses this specific language to describe the area. This has been further reinforced by short term leases, lack of engagement on future leases by Government and land management agreement approaches that are outdated, leaving rural leaseholders with a lack of certainty about their business and links to the land.

As outlined in Chapter 4, the *Canberra Region Food Strategy* proposes a sustainable food and agriculture system for the ACT and surrounding region, and proposes support of local food producers and identifying underutilised land for urban agriculture.[55] However, the Eastern Broadacre Strategic Assessment undermines this Strategy by investigating opportunities for development across this region for a second time. Previous strategic assessments in Gungahlin and Molonglo resulted in substantial developments and loss of both rural lands and native ecosystems.

50 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2024. *Eastern Broadacre strategic assessment*. Available at: https://www.dcceew.gov.au/environment/epbc/approvals/strategic-assessments/act-eastern-broadacre

51 ACT Government, Planning, n.d. *Eastern Broadacre*. Available at: https://www.planning.act.gov.au/projects-priorities/eastern-broadacre

52 ACT Government, 2023. *East Canberra District Strategy*. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0011/2324684/district-strategies-2023-volume-2-district-strategies-east-canberra.pdf

53 ACT Government, Planning, n.d. *Eastern Broadacre*. Available at: https://www.planning.act.gov.au/projects-priorities/eastern-broadacre

54 ACT Government, 2023. *Territory Plan – Part E Zone Policies – E7 – Non-Urban Zones Policy*. Available at: https://www.legislation.act.gov.au/DownloadFile/ni/2023-540/copy/170374/PDF/2023-540.PDF

55 ACT Government, 2024. *Canberra Region Local Food Strategy 2024–2029*. Available at: https://www.act.gov.au/__data/assets/pdf_file/0003/2624673/canberra-region-local-food-strategy-2024-2029.pdf

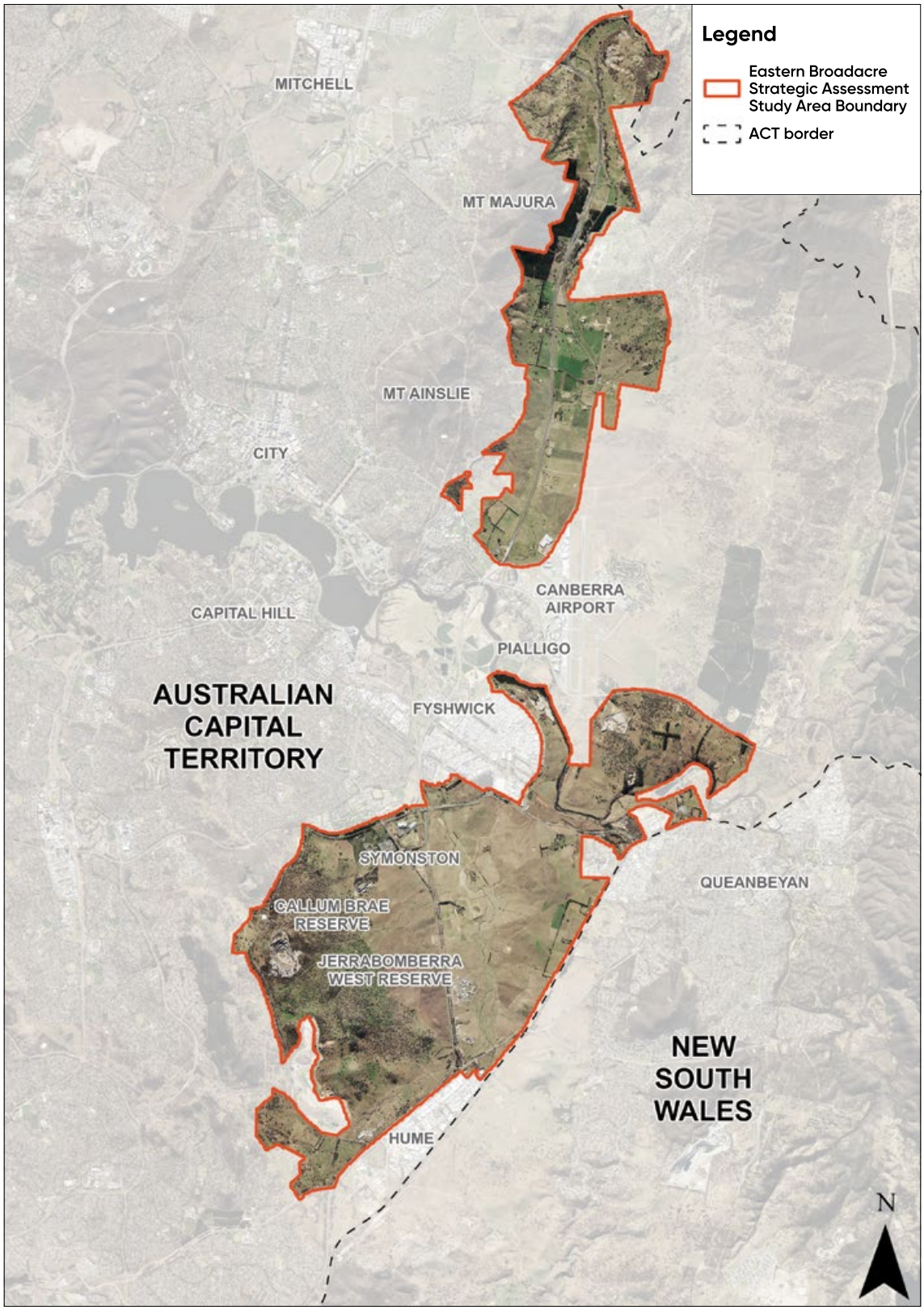


Figure 6.2. Eastern Broadacre Investigation Zones.
Source: Derived from map by ACT Government

The ongoing assessment of Majura and Symonston as areas for future development puts further pressure on farmers and rural leaseholders to "wait and see" what future policy changes will bring. Several reports on the potential development of the Southern/Eastern Broadacre Area include factors such as "the need to provide greater certainty to rural leaseholders regarding the future of the area"[56] yet several years later, the ACT Government has not given that certainty. The lack of a focused agricultural policy for the ACT further challenges the ability for rural leaseholders to prepare for any potential changes in the use of their land.

The issues identified in the establishment and management of Callum Brae Nature Reserve show that it is not sufficient to merely provide legal protection to an area, but that there is a need for ongoing monitoring and management to ensure that threatened ecological communities contained within remain in at least the condition they were when protection began. Should the ACT Government decide to place new areas under the reserve system, appropriate resourcing, both funding and staffing, should be allocated in order to maintain (or where necessary, improve) the condition of the reserve. While accepting that there are impacts on the environment outside the control of the ACT Government (climate change, bushfires, drought etc), there should not be a situation in which the condition of a reserve goes backward. To prevent this, there needs to be funding for the accurate and timely monitoring of the reserve system, allowing identification of issues as they arise. Further, there needs to be adequate staffing to address the maintenance of reserves in a proactive, rather than reactive, manner. These steps would go a long way to ensuring the protected areas in the ACT thrive and continue to support our native species.

Dam at Callum Brae. Source: John Evans

56 ACT Government, ACT Planning and Land Authority, 2010. *Planning the Eastern Broadacre Area: A Discussion Paper*, p.1. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0017/2328020/Discussion_Paper_updated_FINAL.pdf

7

Canberra's western greenfield developments

Construction in Denman Prospect. Source: Ryan Colley

7. Canberra's western greenfield developments

The construction of new suburbs around the Molonglo River corridor to Canberra's west during the past 10 years constitutes some of the most significant greenfield development that has occurred in the ACT over the period of this Investigation. This chapter illustrates some of the complexities described in Chapter 4 in relation to planning and nature conservation policy with real-world examples from this development. Urbanisation of this area has followed required environmental approvals at both the ACT and Commonwealth level, but has still resulted in the sanctioned destruction of Matters of National Environmental Significance (MNES) under these approvals and a range of other impacts on the surrounding environment. This includes impacts on "a maximum of 110 ha" of critically endangered Box-Gum Woodland, including "approximately 40 ha of Box-Gum Woodland that supports mature overstorey species",[1] subsequently impacting breeding and foraging habitat for the Superb Parrot and Swift Parrot.

It is not the intent of this report to interrogate or revisit previous planning decisions, simply to document what those decisions were and explore their environmental outcomes.

7.1 Background

The area surrounding the Molonglo River Corridor was identified as a potential future development area in the Canberra Spatial Plan 2004,[2] and planning for what this might look like began in earnest in 2008. Development of this area has presented a range of challenges to planners and builders, in part due to tricky topography, high bushfire exposure, its location downstream of a large dam and the presence of native vegetation and MNES in some parts of the Molonglo Valley.

A key ACT Government requirement for these developments was to maximise yield and minimise "wastage" of developable land.[3] As a result, suburbs have been constructed on steep slopes, making management of water run-off during construction difficult. Chapter 12 of OCSE's 2022 report, *State of the Lakes and Waterways in the ACT*,[4] considered the impacts of some of these developments on the Molonglo River and downstream waterways in detail. The western edge of Canberra is also at risk from wildfires starting in the Brindabellas, as evidenced by the destruction of property and loss of life in nearby Weston Creek in the 2003 fires. Bushfire protection was therefore a critical factor in planning the vulnerable Molonglo Valley suburbs, again creating tensions with the desire to maximise the developable area.

1 ACT Government, ACT Planning and Land Authority, 2011. *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance.*

2 ACT Government, 2004. *The Canberra Spatial Plan.*

3 Developable land is "generally considered to be land that does not have physical or environmental constraints that would render it unsuitable for development. In jurisdictions around Australia areas of land with slopes greater than 15–20 per cent are generally considered to be unsuitable for development, and are excluded from urban capability assessments". See SGS Economics and Planning, 2011. *Molonglo Stage 2 Draft Planning and Design Framework Options for Western Boundary*. Prepared for the ACT Planning and Land Authority. Available at: https://www.environment.act.gov.au/__data/assets/pdf_file/0006/2055786/22-46260-Documents-16-30.pdf, p.60.

4 Office of the Commissioner for Sustainability and the Environment, 2022. *State of the Lakes and Waterways in the ACT.*

The Molonglo River Corridor. Source: OCSE

The presence of endangered and vulnerable ecological communities in the Molonglo Valley triggered the requirement for the impacts of this development to be assessed under national environment law. A strategic assessment was therefore conducted; this is a mechanism under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which is designed to streamline the referral process, so that one approval can be granted across a broad development area.

In the Molonglo Valley, identified MNES include threatened species, migratory species and important ecological communities, specifically:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Grassy Woodland)
- Natural Temperate Grassland of the Southern Tablelands of NSW and the ACT (Natural Temperate Grassland)
- Pink-tailed Worm Lizard (*Aprasia parapulchella*)
- Superb Parrot (*Polytelis swainsonii*)
- Swift Parrot (*Lathamus discolour*).

The *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance*[5] was endorsed by the federal Environment Minister on 7 Oct 2011,[6] and approved for implementation with no conditions.[7] This approval will expire on 31 Dec 2041.[8] This plan shows the area within which urban development can occur (Figure 7.1).

5 ACT Government, ACT Planning and Land Authority, 2011. *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance.*

6 Australian Government, Department of Sustainability, Environment, Water, Population and Communities, 2011. *Notification of decision to endorse the Molonglo Valley Plan for the Protection of Matters of National Significance, Australian Capital Territory*. Available at: https://www.dcceew.gov.au/sites/default/files/env/pages/b42a89fd-8b94-43d0-8721-81b01ff35a57/files/molonglo-endorsement-instrument.pdf

7 Australian Government, Department of Sustainability, Environment, Water, Population and Communities, 2011. *Approval decision for the taking of actions in accordance with an endorsed plan under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) – Molonglo Valley Plan for the Protection of Matters of National Environmental Significance, Australian Capital Territory*. Available at: https://www.dcceew.gov.au/sites/default/files/env/pages/b42a89fd-8b94-43d0-8721-81b01ff35a57/files/molonglo-approval-instrument.pdf

8 ibid.

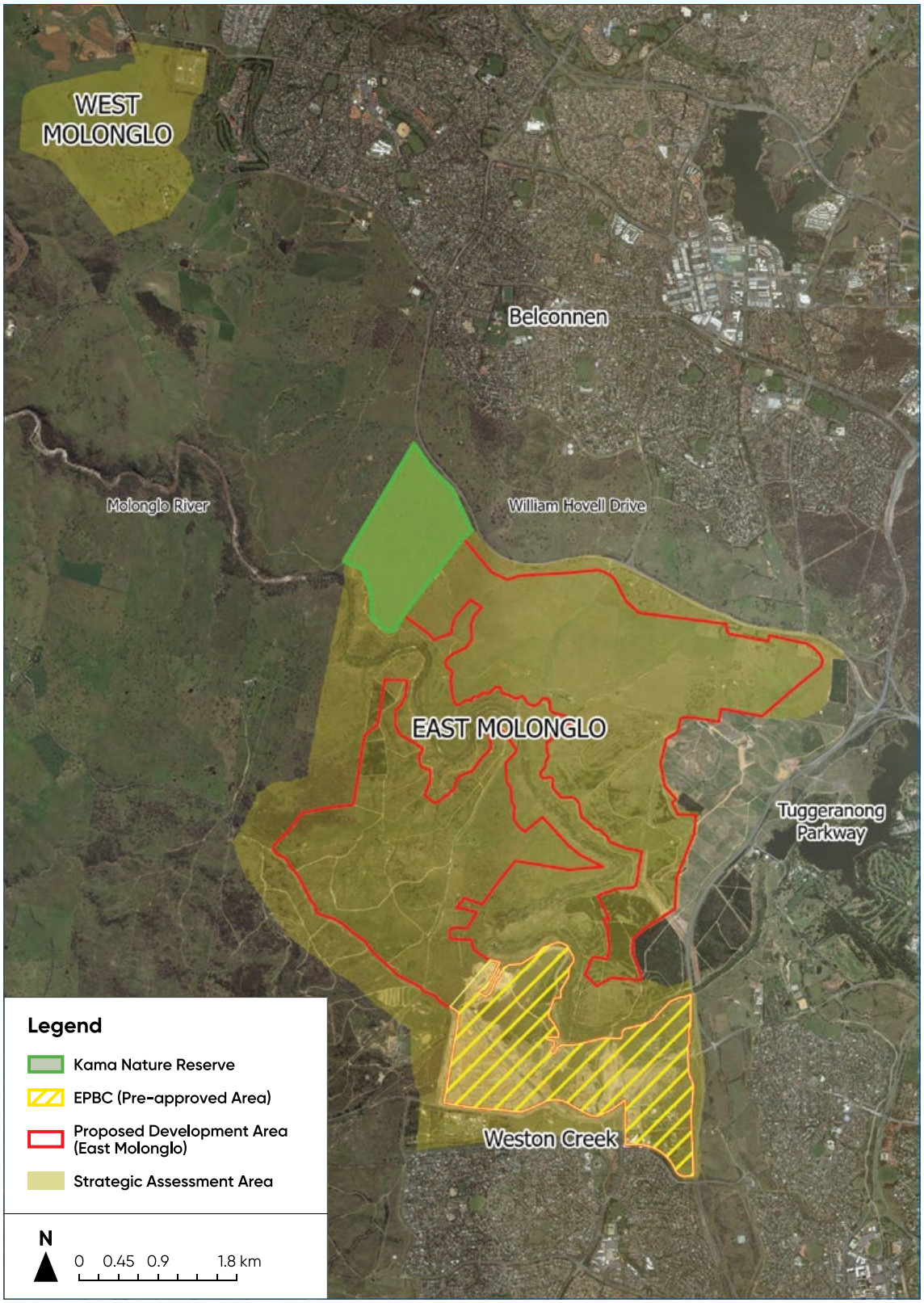


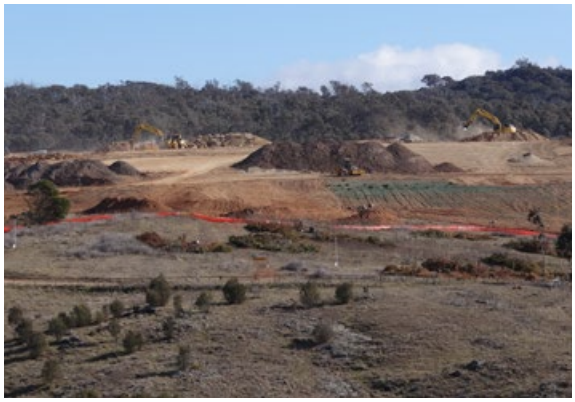
Figure 7.1. Molonglo Valley Strategic Assessment Area, including the urban development footprint.
Source: Derived from map by Eco Logical Australia

The development was divided into different stages to facilitate more efficient and rapid development in those areas with fewer challenges. Construction of Molonglo Stage 1, comprising Coombs, Wright and North Weston, began first as it had simpler approval requirements. Molonglo Stage 2 includes the suburbs of Denman Prospect and Molonglo, while Stage 3 consists of suburbs north of the Molonglo River, with Whitlam being the first to start construction.

7.2 Molonglo Stage 2 and Bluetts Block

Molonglo Stage 2 is of current interest due to recent decisions regarding the development of land adjacent to Bluetts Block.

Bluetts Block is a bush block just beyond the new suburb of Denman Prospect in west Canberra, made up of Stromlo Blocks 403 and 402 (zoned NUZ3 – Hills Ridges and Buffers), and part of Denman Prospect Block 12. This latter block was included in the development area identified in the Molonglo Valley Strategic Assessment Area, zoned as RZ1 (residential suburban). The whole of Bluetts Block also has the Territory Plan overlay "Future Urban Area".



The urban boundary at Bluetts Block, viewed from Namarag. Source: OCSE

Bluetts Block is an area of rich biodiversity, with over 100 different species of plants recorded in an area of approximately 340 ha. These include the Black Mountain Leopard Orchid, which is found only in the ACT. Its woodlands provide important foraging and breeding resources for the Superb Parrot, Swift Parrot, Gang-gang Cockatoo, Little Eagle, a range of small woodland birds and microbats. The nationally vulnerable Pink-tailed Worm Lizard is found at the site, which is also likely to support populations of Dunnart and Antechinus,[9] rare carnivorous marsupials. The site contains Box-Gum Woodland and Natural Temperate Grassland, both of which are Critically Endangered Ecological Communities listed under the federal EPBC Act. It also provides critical landscape connection from the Murrumbidgee River Corridor to Kama Nature Reserve, the Pinnacle Nature Reserve and Stoney Creek Reserve. This connectivity allows animals to move safely into different areas to breed and forage.

The ACT Government's approach to development of Molonglo Stage 2 back in 2011 is articulated in the *Molonglo Stage 2 Draft Planning and Design Framework Options for Western Boundary*,[10] a report prepared in 2011 for the ACT Planning and Land Authority by an independent consultant:

> *In Molonglo Stage 2, because of the high yield requirements (18,000 people) and imperatives for optimising the financial return to government there is a need to minimise 'wastage' of areas suitable for residential and other urban development on the one hand and to ensure adequate efficiency and intensity of development in developable area on the other.*

9 ACT Government. 2022. *A preliminary survey of small native mammals and their habitat at Stromlo East and West, ACT.*

10 SGS Economics and Planning, 2011. *Molonglo Stage 2 Draft Planning and Design Framework Options for Western Boundary*. Prepared for the ACT Planning and Land Authority. Available at: https://www.environment.act.gov.au/__data/assets/pdf_file/0006/2055786/22-46260-Documents-16-30.pdf, p.60.

The exact extent of the development was determined through this options report, including to inform discussions about where Asset Protection Zones[11] for the new suburbs should be located. The consultant considered a range of factors in compiling the report, including bushfire risk, management requirements for Asset Protection Zones, topographical constraints, financial implications and ecological protection. The report presents four options for the development boundary: one to maximise building yield, one to maximise protection of environmental values, and two which sit in between these two options. The consultant recommends "Option 3 – Balance yield, bushfire, environmental and visual outcomes" (Figure 7.2), and notes the following:

> *...much of the land "given up" is steeply sloping land[12] that would be costly to develop... A significant advantage of Option 3, compared to Option 1, is that it reduces the risk that bushfire protection measures associated with the outer APZ would adversely impact on Pink-tailed Worm Lizard and Box-gum habitats, and lead to non-compliance with the Commonwealth's NES[13] requirements...*
>
> *It should be noted that pursuing Option 1 to maximise the developable land and revenues to government could be perceived as an "anti-conservation" position which runs the risk of considerable criticism from environmental interests in Canberra. This may 'taint' the planning work in general and thereby endanger the achievement of other innovations and objectives which will provide a greater financial and policy return. In our opinion Option 3 therefore also represents a risk minimisation strategy.*

In a paper[14] prepared for a meeting in February 2011 of the River Park Concept Plan Steering Committee, ACTPLA notes that it does not agree with the consultant's recommendations, stating that:

> *ACTPLA would give high weighting to bushfire risk management, optimising land development opportunities, and minimising maintenance costs. While the other defining issues remain significant, they are not seen as the driving principles.*[15]

Later the same month, an internal government Technical Working Group also considered the options, and noted while there is a "need to respect the community views, at times government needs to make hard decisions to ensure the broader objectives are being achieved".[16]

In this instance, these "broader objectives" proved to be maximising development at the expense of environmental protection and increased future cost and maintenance challenges for asset protection zones. The working group also endorsed Option 1 (Figure 7.3) as its preferred option.

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11 An Asset Protection Zone is a fuel reduced area surrounding a built asset or structure. Its purpose is to provide a buffer zone between a bushfire hazard and an asset.

12 The steeply sloped area referred to here is part of Denman Prospect Block 12, within Bluetts Block.

13 National Environment Significance.

14 River Park Concept Plan Steering Committee, 2011. *Summary of discussion paper prepared by SGS/Eco Logical Australia for ACTPLA (v9, January 2011)*. Meeting Paper, 4 February 2011. Available at: www.environment.act.gov.au/__data/assets/pdf_file/0006/2055786/22-46260-Documents-16-30.pdf, p.95.

15 ibid, p.96.

16 Western Boundary Options – Molonglo Stage 2. Technical Working Group Meeting minutes 16 February 2011. Available at https://www.environment.act.gov.au/__data/assets/pdf_file/0006/2055786/22-46260-Documents-16-30.pdf, p.139.

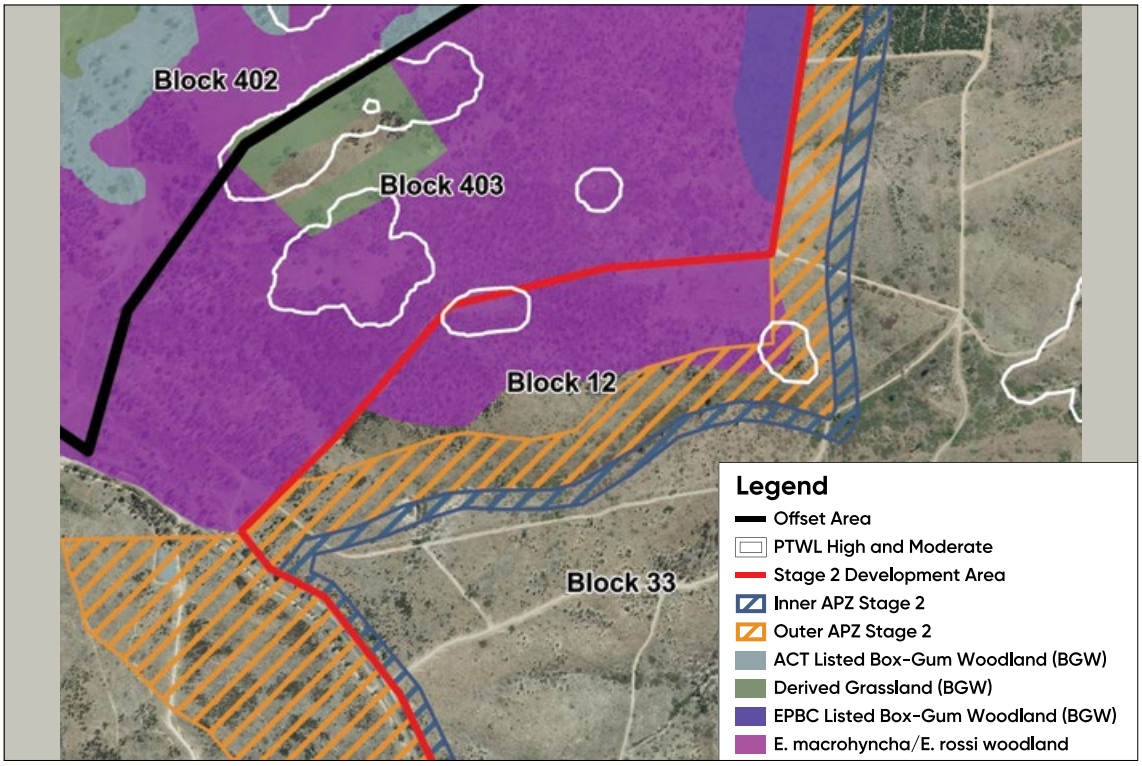

Figure 7.2. Option 3 (preferred by consultant)
No building on woodland in Block 12; no APZ on Block 403.
Source: Derived from map by Eco Logical Australia

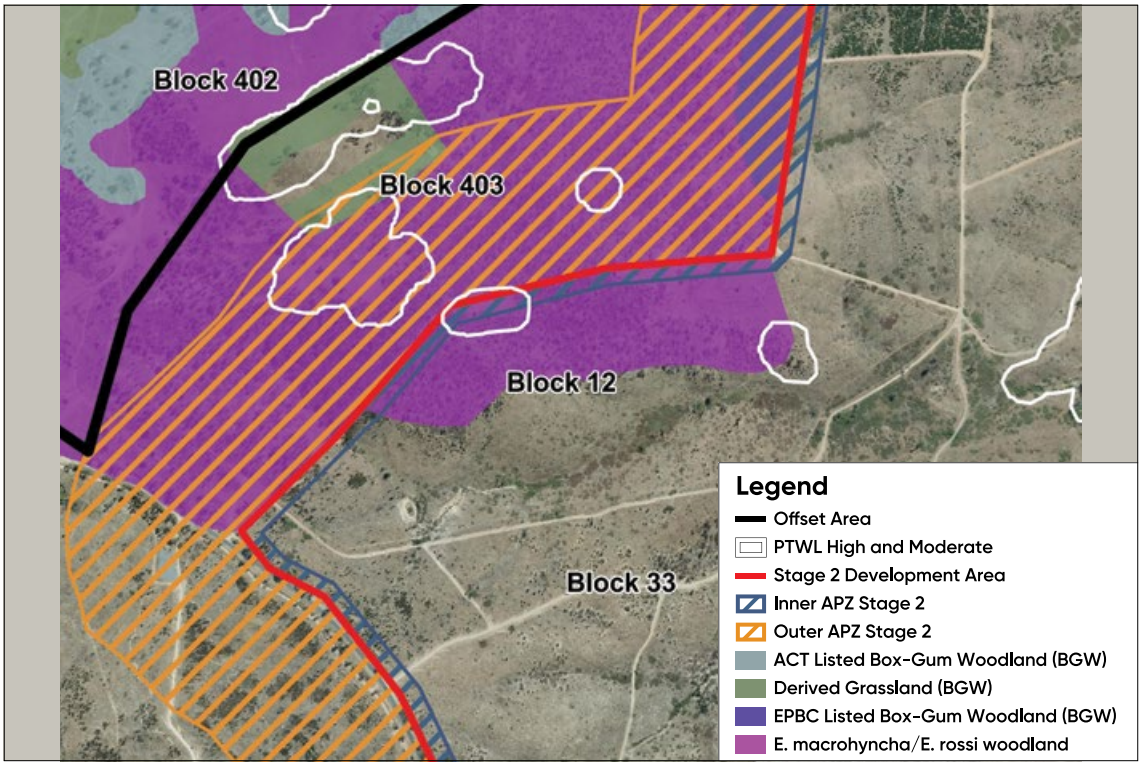

Figure 7.3. Option 1 (preferred by the ACT Government)
Building up to the boundary of Block 12; majority of Block 403 managed as APZ.
Source: Derived from map by Eco Logical Australia

This situation would be unlikley to arise today, as ACT Government thinking on the placement of asset protection zones has progressed. The current Bushfire Management Standards[17] stipulate that asset protection zones should be provided within the development footprint:

> *A fundamental premise for APZs in new developments built after 2022, is that they are provided within the development footprint, ensuring they are cost effective to manage, and that the owner or land manager will be able to maintain the area in perpetuity. The APZ should be able to be managed in a manner which is considerate of the environmental values present at the site.*

In July 2013 an EIS exemption was granted for Molonglo Stage 2,[18] which identified a portion of Block 12 as requiring further assessment to determine its ecological value. This became known as the "deferred area" (Figure 7.4). Notably, the deferred area aligns closely with the Option 3 recommendation presented to – but not accepted by – ACT Government in 2011.

In 2017,[19] another Environmental Impact Statement exemption was granted on the basis that the deferred area would not be developed but managed as an Asset Protection Zone. However, in 2021, an Estate Development Plan[20] was lodged for a portion of Bluetts Block, which proposed approximately 900 single and multi-unit dwellings, a primary school site, recreational areas, bushfire protection zones and associated infrastructure works. As part of this application, the proponent applied for an Environmental Impact Statement exemption for its plans to extend development into the "deferred area" (Figure 7.5). This would require extension of the APZ into Block 403, similar to the Option 1 proposal preferred by ACT Government in 2011. Part of the area proved to be too steep for development to be viable, as indicated in the 2011 options report.

Consultation on the Environmental Impact Statement exemption application took place between December 2021 and February 2022. Fifty-nine submissions were received from members of the public opposing the granting of the exemption. The Conservator of Flora and Fauna, the ACT Heritage Council and the Emergency Services Agency also indicated they did not support the granting of the exemption. The proponent took note of these concerns regarding potential ecological impacts of the development on Block 12 and undertook its own consultation process during 2022. In its consultation report, the proponent notes "The submissions revealed that there is substantial public interest in this area, of which CED was only partially aware prior to the submission being publicly notified".[21] This seems a little surprising given the long recognition of the ecological values of this piece of land and the existence of an active "Friends of Bluetts Block" community group since at least 2019.

17 ACT Government, 2023. *ACT Bushfire Management Standards*. Available at https://esa.act.gov.au/sites/default/files/2023-12/ACT%20Bushfire%20Management%20Standards.pdf

18 ACT Government, 2013. *Notifiable Instrument NI2013–338: Planning and Development (Environmental Impact Statement – Molonglo Valley Stage 2 – Urban Development, Infrastructure and Link Bridge) Exemption 2013.*

19 ACT Government, 2017. *Notifiable Instrument NI2017–183: Planning and Development (Environmental Impact Statement – Denman Prospect Deferred Area and Bushfire Protection Zones) Exemption 2017.*

20 This original Estate Development Plan is no longer publicly available, but an overview is available at: https://www.planning.act.gov.au/applications-and-assessments/environmental-impact-assessment/exemption-from-requiring-an-eis-s211/denman-prospect-2-estate

21 Plan It, 2022. *Consultation Report Block 12 Deferred Area Denman Prospect Section 211 Application.* Prepared for Capital Estate Developments. Available at: www.environment.act.gov.au/__data/assets/pdf_file/0006/2468832/24_021984-Attachment-B-Documents-Point-4-91-94.pdf

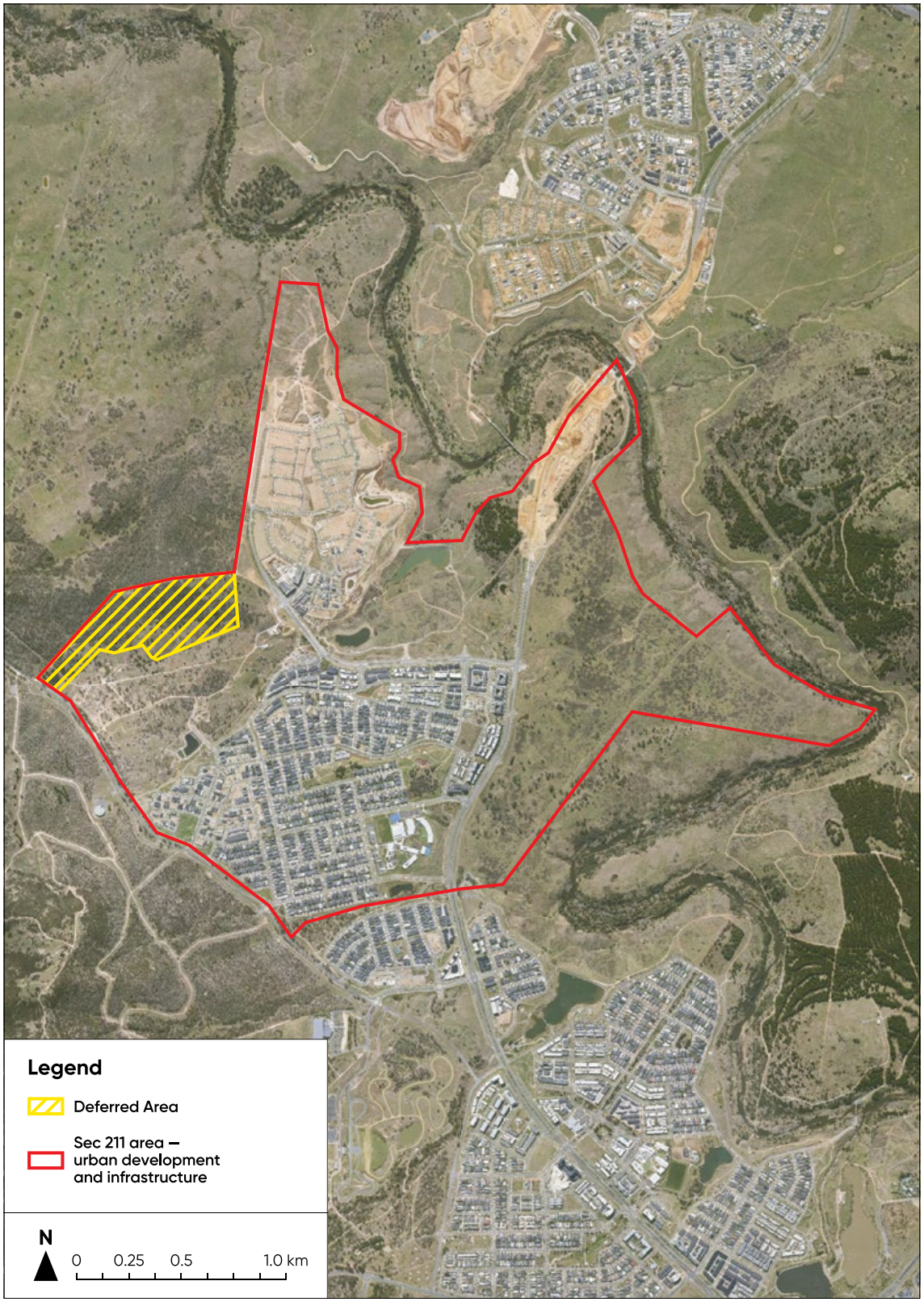

Figure 7.4. Molonglo Stage 2 showing the "deferred area" identified as requiring additional ecological assessment.
Source: Derived from map by ACT Government

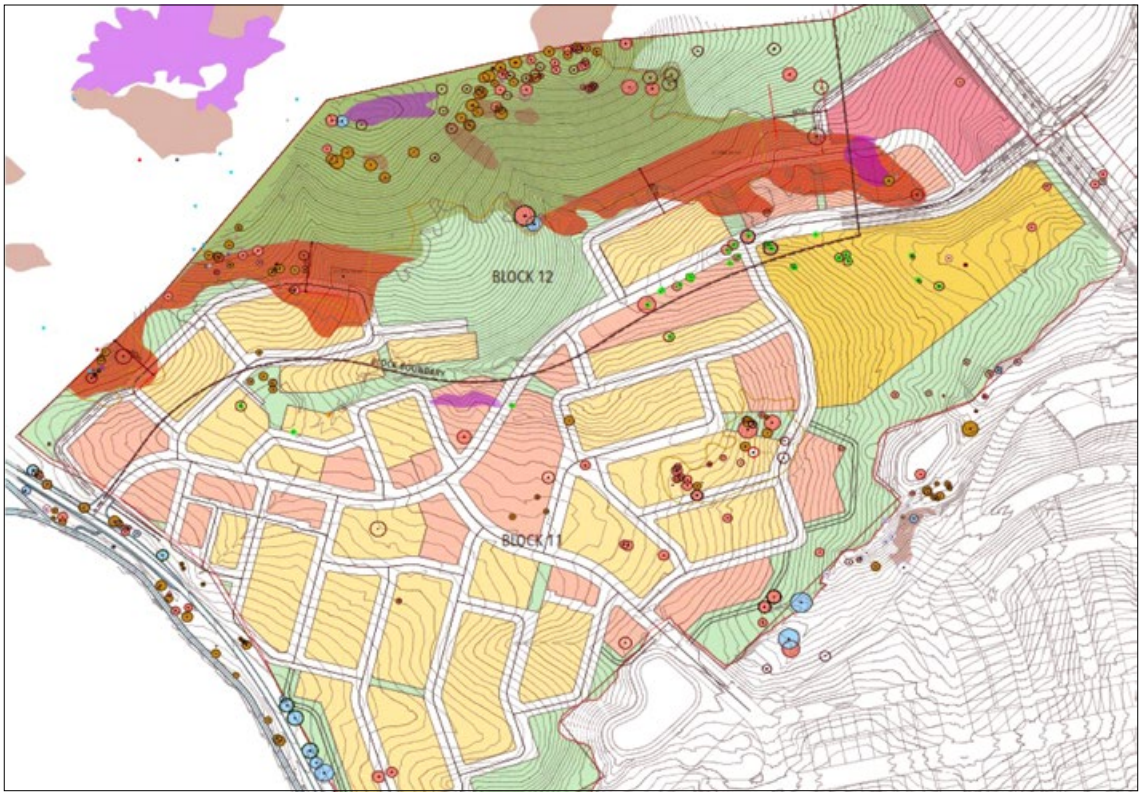

Figure 7.5. Proposed development layout from 2021 EIS exemption application.
Source: Derived from map by Plan It[22]

Consideration of submissions from both the public and government referral entities led to a revised EIS exemption application being submitted in November 2022.[23] This updated version avoided building in the deferred area and reduced the direct impact on native vegetation from 16.1 ha to 7.14 ha. It was supported by the Heritage Council and Emergency Services Agency. The Conservator of Flora and Fauna expressed ongoing reservations about the environmental impacts of the development.

22 Prepared for Capital Estate Developments.
23 Plan It, 2022. *Section 211 Exemption Application Report, Block 12 Section 1 Deferred Area, Denman Prospect*. Prepared for Capital Estate Developments. Available at: www.planning.act.gov.au/__data/assets/pdf_file/0006/2574744/EIS-Exemption-Application-Report.pdf

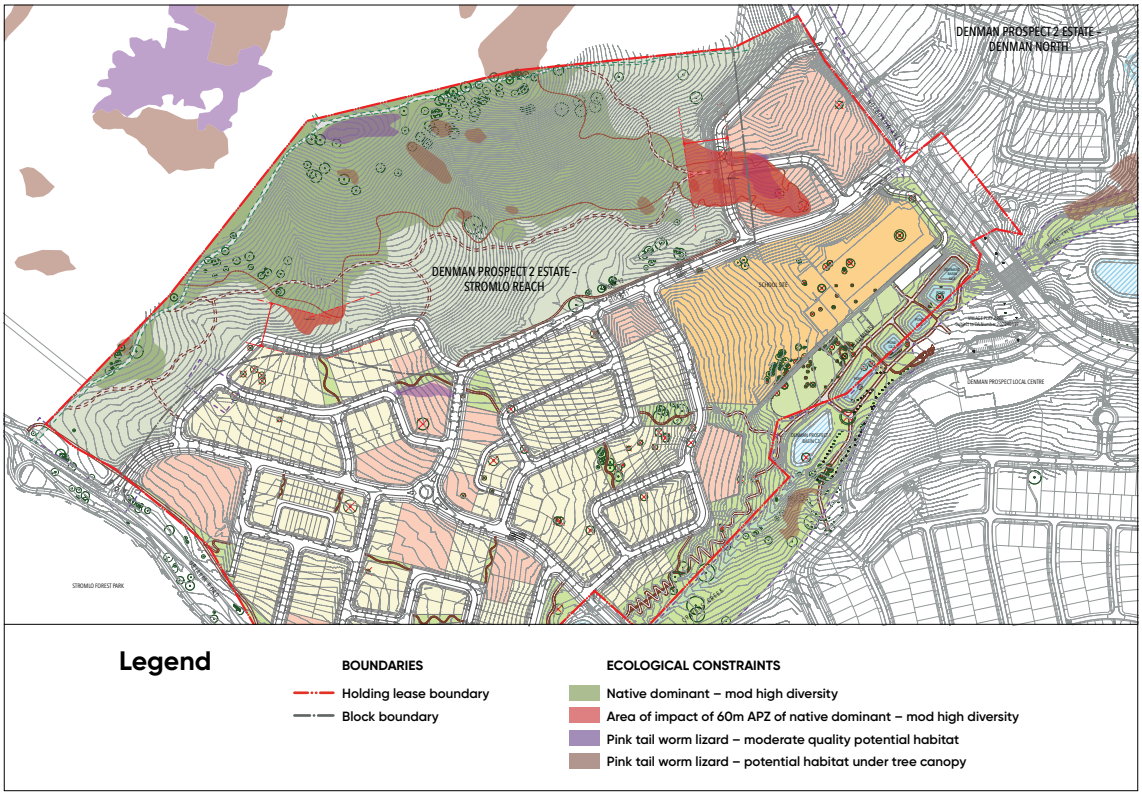

Figure 7.6. Proposed development layout from 2022 EIS exemption application.
Source: Derived from map by Plan It[24]

In March 2023 the ACT Planning Authority prepared a report[25] for the Minister for Planning in relation to the EIS exemption application recommending that it should be granted, which it duly was in June 2023.[26] DA202341900 for the Estate Development Plan was submitted in July 2023.

On 27 February 2024, the Minister for Planning exercised call-in powers[27] enabling him to unilaterally grant DA202341900 without further consultation or advice. These powers have been removed from the updated 2023 ACT Planning System, but the Minister was able to exercise them in this case since the development was submitted before the new system was enacted. This approval allowed for:

- creation of 295 single residential blocks
- creation of 15 multi-unit sites to accommodate 839 dwellings
- creation of 14 open space blocks including
- earthworks and tree removal, and
- construction of utility services, roads, infrastructure, and associated works.

Conditions relating to environmental and heritage protection were included in the approval.

24 Prepared for Capital Estate Developments.

25 ACT Government, Environment, Planning and Sustainable Development Directorate, 2023. *Application for Environmental Impact Statement Exemption Consideration Report*. Available at: www.planning.act.gov.au/__data/assets/pdf_file/0020/2354411/denman-prospect-2-estate-deferred-area-exemption-consideration-report-2023.pdf

26 ACT Government, 2023. *Notifiable instrument NI2023–291: Planning and Development (Denman Prospect 2 Estate Deferred Area) EIS Exemption 2023.*

27 ACT Government, 2024. *Exercise of Call-in Powers DA202341900 Blocks 11 and 12 Section 1 Denman Prospect and Block 8 Section 2 in Denman Prospect*. Available at: www.parliament.act.gov.au/__data/assets/pdf_file/0007/2425705/8_Exercise-of-Call-In-Powers-DA202341900-Blocks-11-and-12-Section-1-Denman-Prospect-and-Block-8-Section-2-Denman-Prospect.pdf

What is notable in this rather complex example is that the final boundary agreed for the development in 2022 is almost identical to the one recommended to the ACT Government in 2011 by an independent consultant contracted to analyse potential boundary options. The Government rejected this recommendation at the time, choosing instead to pursue the boundary alignment that allowed for the maximum number of dwellings to be constructed and thereby generate the highest profit. Subsequently, the Government, community and eventual developer spent over 10 years and substantial effort and resources debating this decision and resulting in significant financial outlays and delays in construction.

Bluetts Block Nature Reserve – a secure future?

Bluetts Block. Source: OCSE

On 24 August 2024, the ACT Government announced that it was starting the process to create a nature reserve at Stromlo Block 403 and the undeveloped areas of Denman Prospect Block 12. In a media release, it also stated that it is "separately undertaking further investigation and consultation with the lessee on adjacent Block 402 Stromlo regarding the future protection of environmental values".[28]

As explained in Chapter 4, the designation of nature reserves is accomplished through a minor plan amendment to the Territory Plan. On 14 February 2025, an amendment was enacted through NI2025–75 to formalise Bluetts Block as a nature reserve under the Territory Plan by adding the relevant overlay.

Notably, the ACT Government has no firm plans to remove the Future Urban Area overlay which remains over Stromlo Block 403 and Denman Prospect Block 12.[29] According to section 89 of the *Planning Act 2023*, this means that the Planning Authority would be able to remove its nature reserve designation by another minor plan amendment. A minor plan amendment is made by a notifiable instrument. Unlike a disallowable instrument, notifiable instruments are not subject to review and refusal by the Legislative Assembly.

In order to fully ensure that protected areas like the newly-reserved Bluetts Block are genuinely safe from development in the long term, the mechanism by which protection as a nature reserve is removed needs to follow a more rigorous process than the relatively simple passing of a notifiable instrument. Should development of these areas be deemed necessary in future, the ability to remove nature reserve status sits solely with the Planning Authority and there is no recourse through any legislated process for this to be challenged. A lack of security for protected areas is inbuilt to the legislative framework by the subservience of the *Nature Conservation Act 2014* to the *Planning Act 2023*.

28 ACT Government, 2024. *New nature reserve in Stromlo promised*. Available at: https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/vassarotti/2024/new-nature-reserve-in-stromlo-proposed

29 ACT Minister for Planning, 2025. Personal communication. Hearings for Legislative Assembly Inquiry into Annual Reports, 18 February 2025.

7.3 Molonglo Valley offsets

Creation of environmental offsets to compensate for the destruction of critically endangered ecological communities during construction of new suburbs in the Molonglo Valley built into the *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance 2011*[30], and must be implemented. This plan maps and explains that "three offset sites will be established within the strategic assessment area (Kama Nature Reserve, Molonglo River Park, Patch GG) that will provide for the long term protection of 234 ha of Box-Gum Woodland" (Figure 7.7).

In 2015, ecological management guidelines were made to guide the management of all offsets taken to compensate for the urban development in the Molonglo Valley.[31] In 2019, a management plan was made for the Molonglo River Nature Reserve.[32] The plan prescribes management for two areas labelled in the *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance 2011* as "Kama Nature Reserve" and "River Park". The document states that 15 per cent of the Molonglo River Nature Reserve is Box-Gum Grassy Woodland, and four per cent is Natural Temperate Grassland. These areas are mapped in the management plan.

Kama Nature Reserve. Source: Richie Southerton

On 28 Feb 2020, three former nature reserve areas, "Kama", "Molonglo River" and "Lower Molonglo River", were brought together with additional areas to make the new Molonglo River Nature Reserve.[33]

Even though it has been declared an offset, concerns remain about urban encroachment and the associated edge effects on Kama Nature Reserve, which contains 117 ha of Box-Gum Grassy Woodland. This encroachment is likely to reduce the reserve's capacity to support threatened species. Additionally, despite the presence of river reserves and buffer zones, indirect effects on the river corridor offset area are anticipated. These could include increased runoff, pollution and sedimentation, all of which could degrade the quality of river habitats. The siting of these offset areas so close to urban development inherently impairs their capacity to support the ecosystems they are designed to protect.

30 ACT Government, ACT Planning and Land Authority, 2011. *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance.*

31 ACT Government, 2015. *Molonglo river reserve & offset areas: ecological management guidelines.* Available at: https://nla.gov.au/nla.obj-603766276/view

32 ACT Government, 2019. *Disallowable Instrument DI2019–192: Nature Conservation (Molonglo River Reserve) Reserve Management Plan 2019.*

33 ACT Government, Parks ACT, n.d. *Molonglo River Reserve*. Available at: https://www.parks.act.gov.au/find-a-park/molonglo-river-reserve; That the merge occurred on 28 February 2020 is shown in: Australian Government, Department of Climate Change, Energy, the Environment and Water, 2020. *Terrestrial Protected Areas Detailed List in ACT*. Available at: https://www.dcceew.gov.au/sites/default/files/env/pages/2691c80f-5001-49cc-97d1-9998a5530918/files/capad2020-terrestrial-act.xlsx

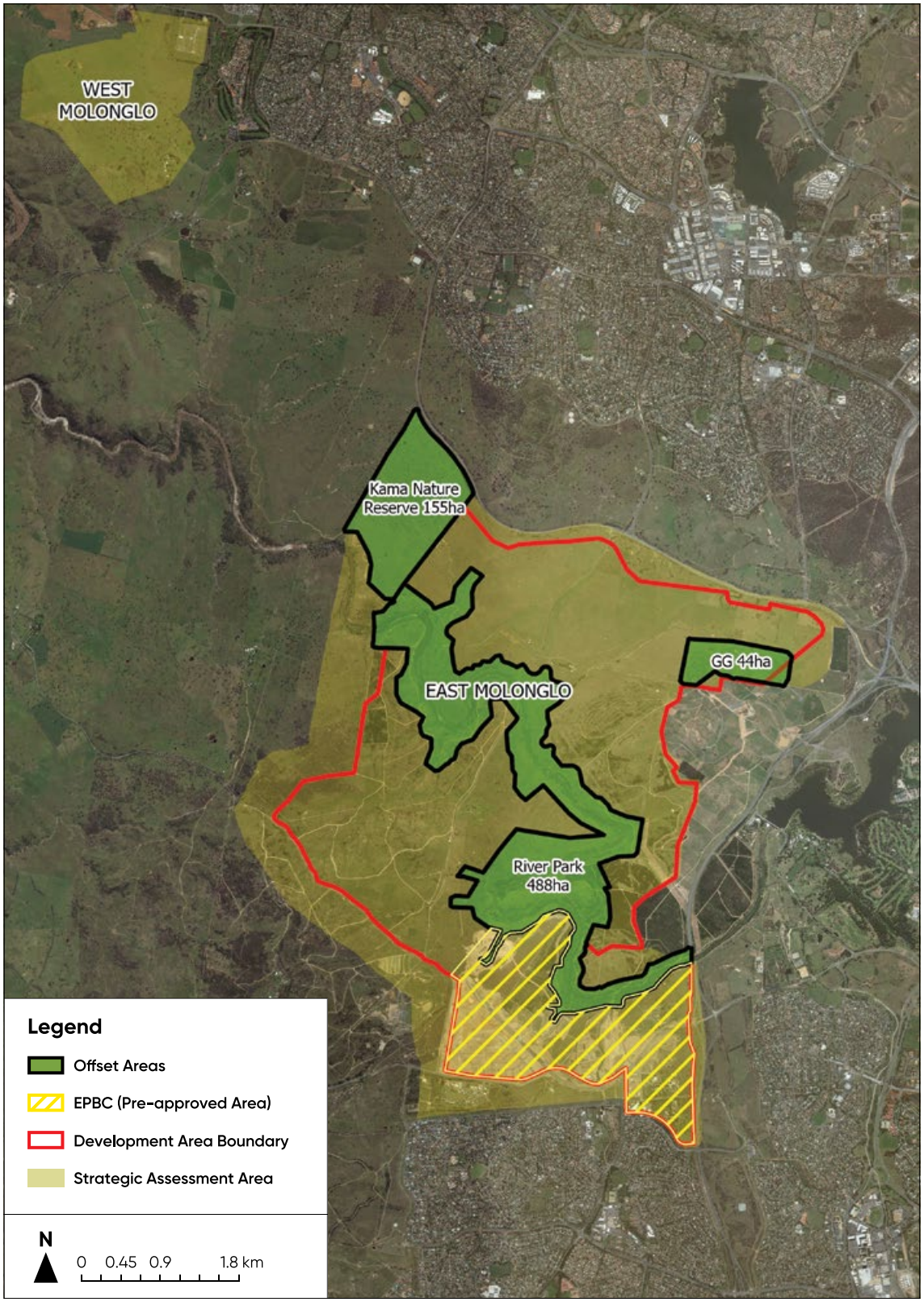

Figure 7.7. Proposed offset areas of Molonglo Valley Developments.
Source: Derived from map by ACT Government

7.3.1 Additionality

Offsets are supposed to offer "additionality" by protecting an area that would not otherwise have been reserved for conservation. In the case of the Molonglo Valley development, there are questions as to whether this additionality was achieved.

The *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance 2011* endorsed by the Commonwealth Environment Minister notes as part of its offset arrangements, "Recognition of the Kama Nature Reserve as an offset site and ongoing management of the area with a focus on its MNES values".[34] However, the August 2011 iteration of the Territory Plan,[35] in place when the offset locations were approved, shows Kama is already a nature reserve and the river corridor a special purpose reserve. It is highly unlikely that either of these would have been slated for development even without the offset declaration. It is also unlikely that urban development would have occurred within the river corridor even without legal protection due to its steep and rocky terrain. Additionally, a large proportion of the river corridor is within the ACT's one per cent annual exceedance probability flood level (formerly known as the "100 year flood" level), and planning generally seeks to avoid development in such areas.

The inclusion of these areas within the offset for the Molonglo Valley developments appears to offer no additional protection for the habitats the offset scheme is supposedly seeking to preserve beyond what was afforded by their status before the offset was established.

Conversely, earlier proposals for offsets included Stromlo Block 402 (see area A in Figure 7.8).[36] This is the portion of Bluetts Block that has not yet received protection as a nature reserve. This offset would have offered genuine additionality in comparison with what was ultimately adopted. Given ongoing discussions about the future of Block 402, it is possible the area may ultimately become part of the reserve system in any case.

34 ACT Government, ACT Planning and Land Authority, 2011. *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance*, p.11.

35 ACT Government, 2011. *Territory Plan 2008 (ACT), Molonglo Map*.
Available at: https://www.legislation.act.gov.au/DownloadFile/ni/2008-27/copy/71101/PDF/2008-27.PDF

36 SGS Economics and Planning, 2011. *Molonglo State 2 Draft Planning and Design Framework Base Analysis*.
Prepared for the ACT Planning and Land Authority.
Available at: https://www.environment.act.gov.au/__data/assets/pdf_file/0006/2055786/22-46260-Documents-16-30.pdf, p.25.

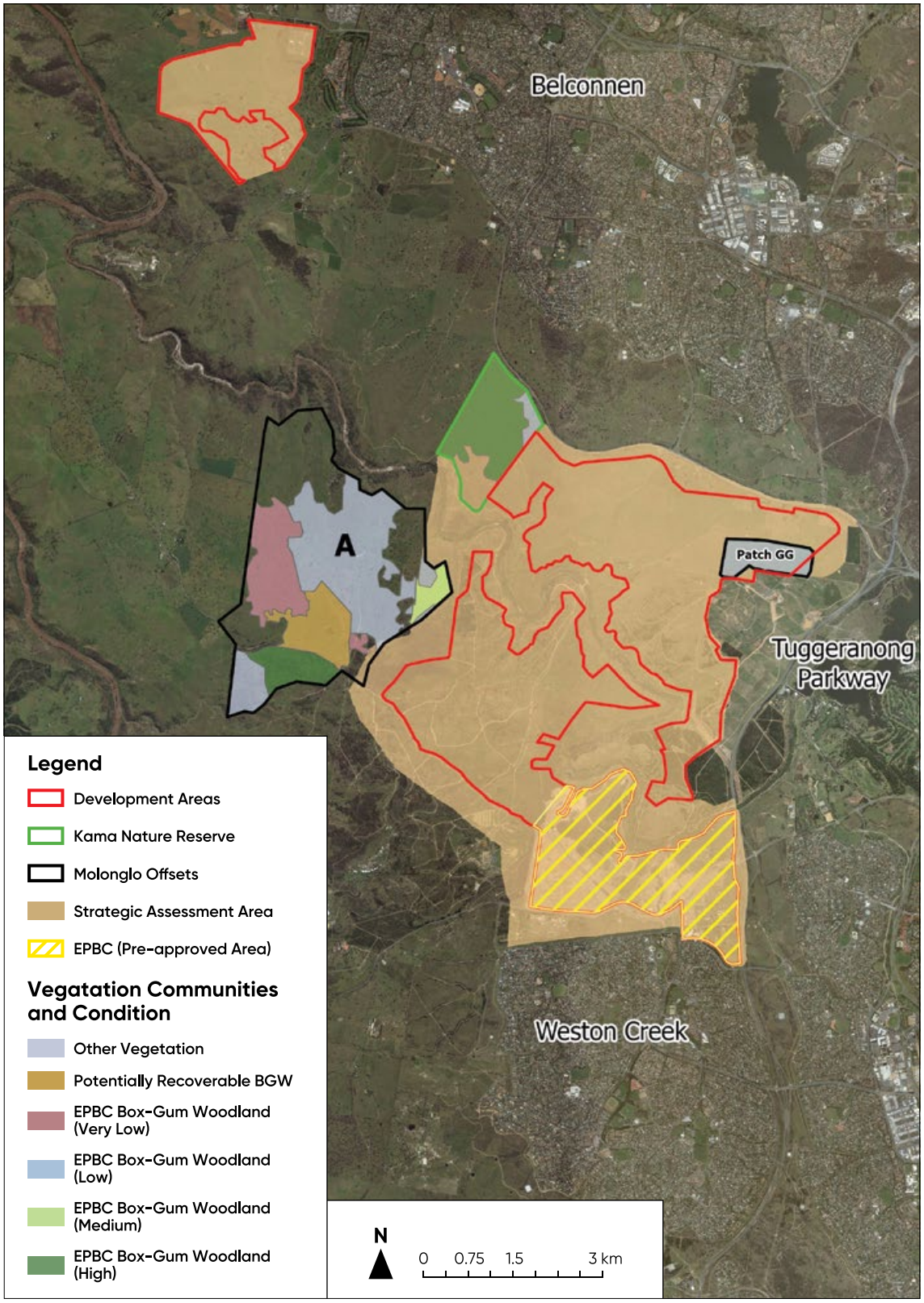

Figure 7.8. Proposed offset areas for Molonglo Developments in 2011.
Source: Derived from map by Eco Logical Australia

7.4 Beyond the Molonglo Valley – Western Edge Investigation Area

The Western Edge Investigation Area is an area of the ACT that is being investigated for potential future uses, possibly including both environmental protection and urban areas (Figure 7.9). It is bordered by the Murrumbidgee River to the west, north–west and south, and existing suburbs and future suburbs (Ginninderry, Whitlam and Denman Prospect) to the north and east. It covers approximately 9,800 ha and comprises 161 blocks across four districts (Belconnen, Stromlo, Tuggeranong and Weston Creek).

The ACT Government notes that "these are preliminary investigations into the Western Edge to assess the suitability of the area for future development".[37] Potential greenfield development of this area is already considered within the evaluation of economic access and opportunities for the Molonglo Valley District.

The Western Edge was selected for investigation in the 2018 ACT Planning Strategy. Given the high potential ecological value of the area, the ACT Government commissioned a series of ecological surveys to assess the potential impacts of development on native species and communities. These studies encompass vegetation and habitat assessments, surveys of small native mammals and birds, as well as targeted reports on species such as the Little Eagle and Murray Crayfish. Together, these reports provide critical baseline data on the Western Edge Investigation Area's ecological significance, identifying both risks from urban development and strategies to mitigate negative impacts.

37 ACT Government, nd. 'Does this mean more development and more houses in the area?' https://www.planning.act.gov.au/projects-priorities/western-edge-investigation

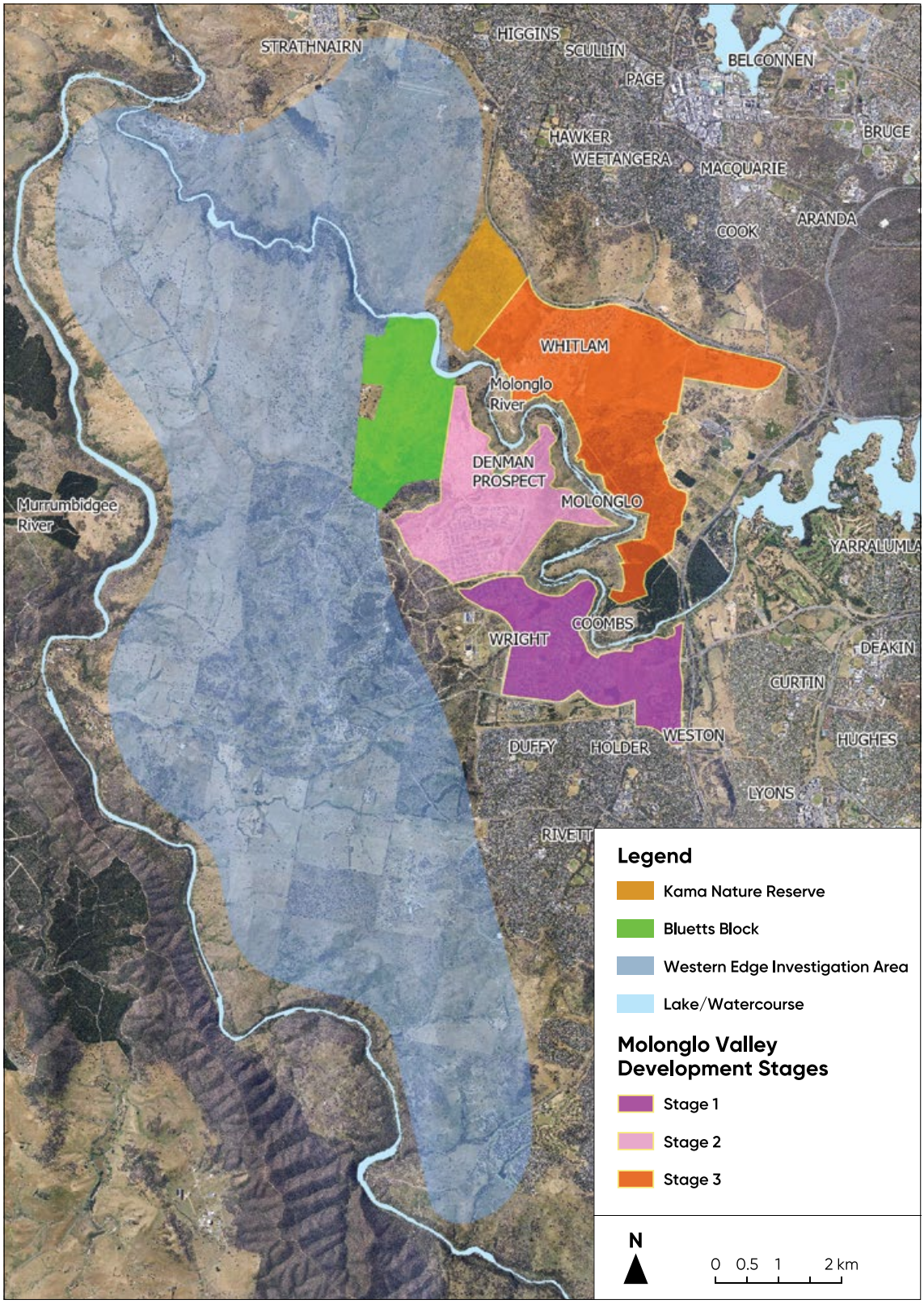

Figure 7.9. Western Edge Investigation Area in relation to established Canberra suburbs, the Molonglo Valley developments, and reserves.
Source: Derived from map by ACT Government

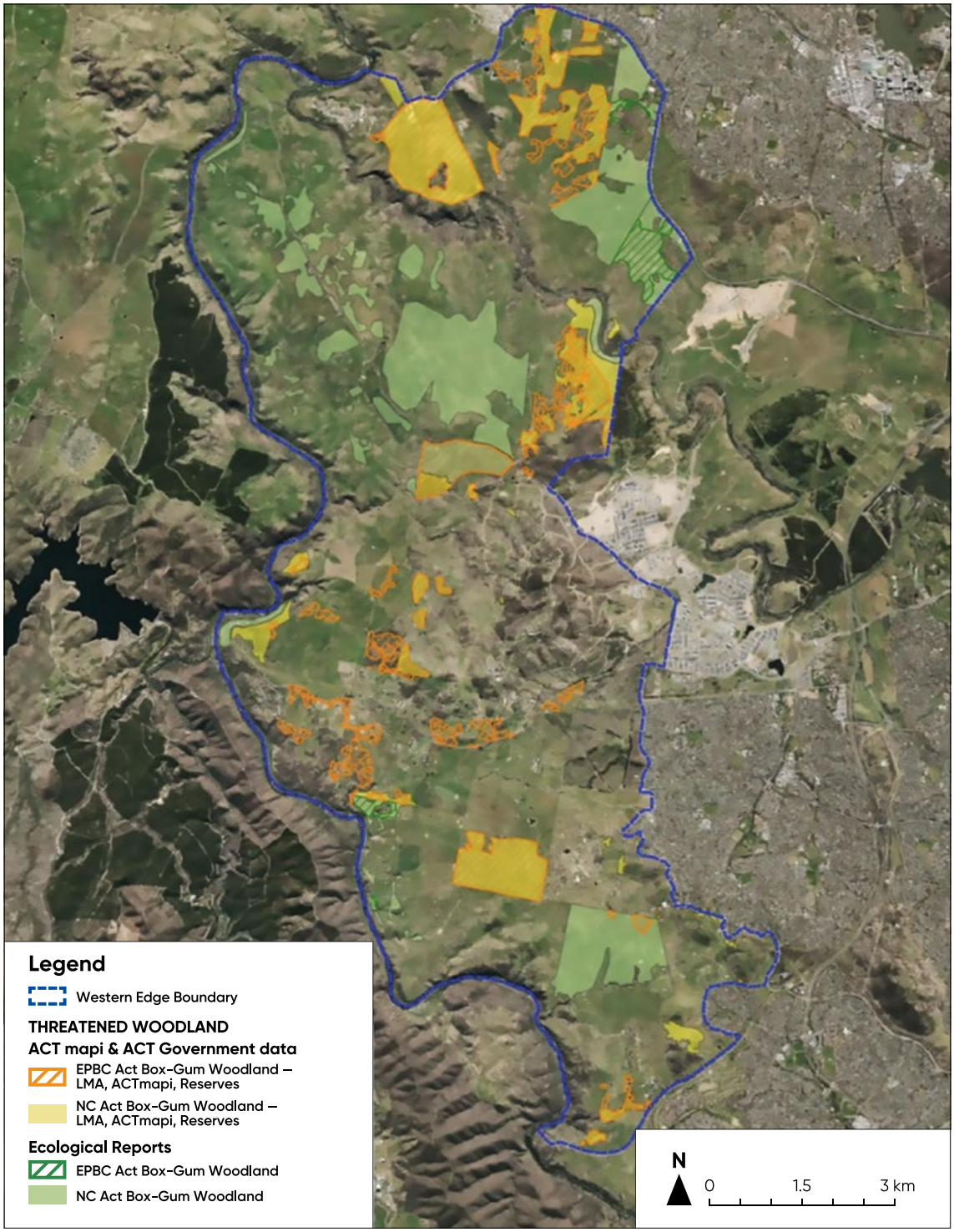

Figure 7.10. Extent of Box-Gum woodland in the Western Edge Investigation Area. Source: ACT Government

7.4.1 Threatened communities and species found in the Western Edge Investigation Area

Bordered by the Murrumbidgee and Molonglo Rivers, the Western Edge Investigation Area includes a mix of endangered Box-Gum Grassy Woodland, Natural Temperate Grassland and significant riparian zones. The Box-Gum Grassy Woodland classified under the EPBC Act covers approximately 882 ha, with large, connected patches north and south of the Molonglo River that are important for regional conservation.[38] An additional 1,216 ha are recognised under the *Nature Conservation Act 2014 (ACT)*. Natural Temperate Grassland covers about 210 ha, primarily along the upper Molonglo slopes. These critically endangered grasslands retain significant ecological value despite some invasive species impacts.[39] The riparian zones along the Murrumbidgee (26 km) and Molonglo (seven km) Rivers support diverse vegetation and serve as vital corridors for species movement and connectivity, particularly in relatively undisturbed areas.[40]

In addition to this, surveys have to date identified 47 "rare and uncommon" flora species including substantial patches of vegetation dominated by either Drooping Sheoak (*Allocasuarina verticillata*), Black Cypress Pine (*Callitris endlicheri*) or Fern species.

Brown Treecreeper. Source: David Cook via https://canberrabirds.org.au/our-birds/photo-gallery

The Box-Gum Grassy Woodland and Natural Temperate Grassland in the Western Edge Investigation Area are essential habitats supporting various specialised flora and fauna, including the Superb Parrot, Scarlet Robin and Brown Treecreeper.[41] Rocky grasslands within the area provide critical habitats for the vulnerable Pink-tailed Worm-lizard,[42] while riverine environments along the Murrumbidgee support aquatic species such as the Murray Crayfish.[43] Although the Little Eagle is not a permanent resident, it is a seasonal visitor using parts of the Western Edge Investigation Area for foraging.[44]

38 Capital Ecology, 2021. *Western Edge Investigation Area – Preliminary Ecological Review*. Prepared for the Environment, Planning and Sustainable Development Directorate, ACT Government. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0008/2328272/5.-Preliminary-ecological-review-Redacted.pdf

39 ibid.

40 Bartlett, T., Love, J., Manion, G., et al, 2022. *Western Edge Investigation Area: River and Riparian Zones – Regional Context and Knowledge Gaps*. Prepared for the Environment, Planning and Sustainable Development Directorate, ACT Government. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0010/2510992/western-edge-river-and-riparian-zones.pdf

41 Greening Australia, 2023. *Western Edge Woodland Bird Surveys*. Prepared for the Environment, Planning and Sustainable Development Directorate, ACT Government. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0011/2510993/western-edge-woodland-bird-surveys-report.pdf

42 Capital Ecology, 2021. *Western Edge Investigation Area – Preliminary Ecological Review*. Prepared for the Environment, Planning and Sustainable Development Directorate, ACT Government. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0008/2328272/5.-Preliminary-ecological-review-Redacted.pdf

43 Eco Logical Australia, 2023. *Western Edge Investigation Area - Murray River Crayfish Survey*. Prepared for the ACT Government. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0008/2510990/western-edge-murray-crayfish-survey.pdf

44 Rae, S., 2023. *Little Eagles in the Western Edge area of the ACT*. Prepared for the ACT Government. Available at: https://www.planning.act.gov.au/__data/assets/pdf_file/0007/2510989/little-eagles-in-the-western-edge-of-the-act-report.pdf

The investigation area was found to support:

- 12 threatened bird species
- 513 ha of confirmed Superb Parrot breeding habitat, as well as two of the three known Superb Parrot breeding locations in the ACT
- a substantial number of current and historic Little Eagle nest sites, and
- 778 Pink-tailed Worm-lizard records, 617 ha of confirmed Pink-tailed Worm-lizard habitat and 73 ha of potential Pink-tailed Worm-lizard habitat.

Almost all areas of the Western Edge Investigation Area that support a remnant canopy are likely to contain important foraging and breeding habitat for a wide variety of threatened bird species.

It is clear from preliminary assessments that the Western Edge Investigation Area supports significant environmental values and habitat corridors, including the Molonglo and Murrumbidgee River corridors. Habitat connectivity throughout the area is not only vital for the flora and fauna that the area supports but also for the flora and fauna that occur in the wider locality. That is, the environmental value of the investigation area extends beyond the bounds of the area itself and beyond the individual species, community types or singular environmental factors that might be considered.

7.4.2 Potential impacts of future urban development

Were it to occur, urban expansion within the Western Edge Investigation Area could be expected to bring extensive habitat loss, fragmentation and edge effects, all of which pose significant threats to the area's biodiversity. It should be noted that no decision has yet been made regarding the future of the investigation area. As has been outlined above, environmental protections currently in place have failed to provide meaningful protection for MNES during other developments that have taken place to Canberra's west, with 110 ha of Box-Gum Grassy Woodland impacted during construction in the Molonglo Valley.

Blackberry bush. Source: EPSDD

Habitat loss from land clearing could directly remove large sections of Box-Gum Grassy Woodland, Natural Temperate Grassland and riparian corridors. These are vital for species such as the Superb Parrot, requiring hollow-bearing trees for nesting, and the Scarlet Robin, reliant on woodland structure for feeding and breeding. Additionally, destruction of specific rocky microhabitats would critically impact the vulnerable Pink-tailed Worm-lizard population, whose habitat preferences are closely tied to these unique features.

Habitat fragmentation into isolated patches would further compromise species dependent on expansive, continuous landscapes. For instance, the Little Eagle requires undisturbed areas for hunting and may abandon the region if fragmentation reduces access to suitable foraging grounds.[45] Smaller mammals, like the Common Dunnart, are also at risk, as fragmented habitats increase exposure to predators and limit gene flow, weakening population resilience and adaptability. Furthermore, there will potentially be a loss of

45 ibid.

paddock trees, which are used by Little Eagles for nesting, and reduction in She-oak (*Allocasuarina sp*) habitats, which are essential for the Glossy-black Cockatoo.

Edge effects are anticipated to significantly alter conditions along the boundaries between natural and urbanised areas. Increased light, noise and human activity degrade habitat quality at the edges and favour invasive species. In particular, invasive plants such as Blackberry and African Lovegrass are expected to proliferate under these edge conditions. Edge effects would also facilitate the spread of aggressive species like the Noisy Miner. Modelling done for the Western Edge investigation indicates that under some development scenarios, almost all the MNES in Stromlo District could be within 500 m of an urban edge if development was to occur in the Western Edge Investigation Area.

Any potential development in the area will directly lead to the loss or degradation of habitats for several threatened plant species, including Austral Toadflax, Hoary Sunray, Murrumbidgee Bossiaea, Pale Pomaderris, and the Small Purple-pea. Mature trees with hollows, which are crucial nesting sites for Superb Parrots, will also be lost, along with nearby foraging areas in grassland and grassy woodland.

In addition, woodland habitats that support a range of threatened bird species will be impacted. These include habitats for the Brown Treecreeper, Scarlet Robin, White-winged Triller, Diamond Firetail and Varied Sittella, which were identified in bird surveys by Greening Australia in 2023. The loss of these habitats will further threaten the survival of these species in the region.

Critically, it is not the loss of one habitat type or keystone structure or species that threatens the ecological integrity of this area. It is the disruption of the entire landscape and the interrelationships and connections between different habitat types, including those which are not considered "high priority" from a nature conservation perspective.

While the ACT Government has not yet decided whether development of the Western Edge Investigation Area will be undertaken, the Suburban Land Agency and its predecessor the Land Development Agency have already purchased substantial lease holdings within the area (Figure 7.11). This does not necessarily mean these holdings will be built on; e.g. they may be used for offsetting development elsewhere in the ACT.

Varied Sittella. Source: Julian Robinson via canberrabirds.org.au/our-birds/photo-gallery

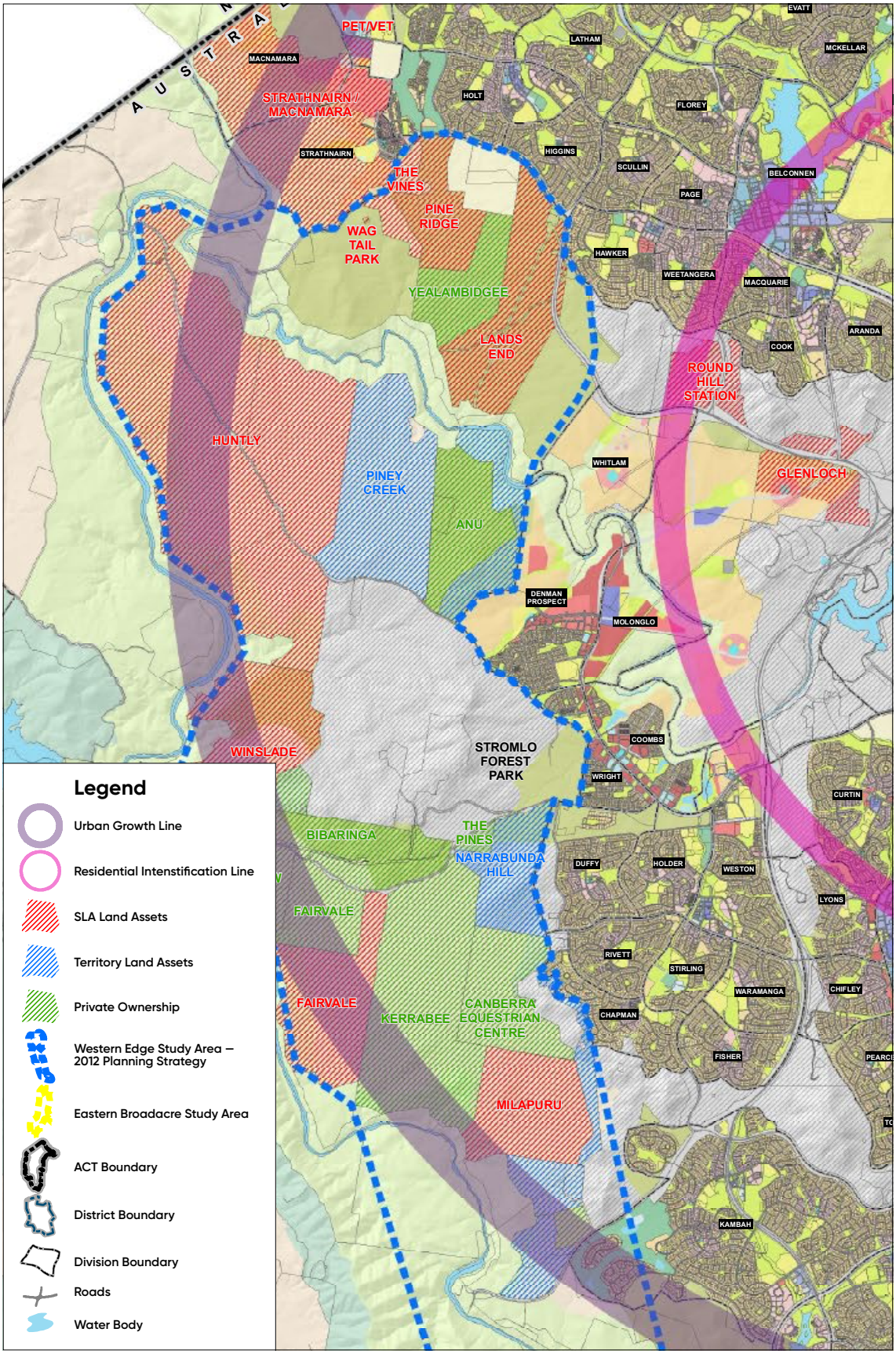

Figure 7.11. Existing SLA land assets in the Western Edge Investigation Area.
Source: Derived from map by ACT Government

7.4.3 Riparian habitats, water quality and hydrology

The Western Edge Investigation Area straddles three water management areas (the lower Murrumbidgee, the Upper Murrumbidgee and lower Molonglo catchments). The Murrumbidgee and lower Molonglo Rivers within the Western Edge Investigation Area have been identified as unique, having significant riparian vegetation, and being among the last of the good quality reaches of these rivers in the ACT and downstream. The Murrumbidgee River supports threatened aquatic fauna species such as Macquarie Perch, Murray Cod, Trout Cod and Murray River Crayfish.

River corridors are sensitive to urban development both due to direct terrestrial impacts (e.g. loss of trees and rocks) and indirect aquatic impacts (e.g. pollution and sedimentation). Threatened species that occur in river corridors threatened by urban development in the ACT are the Pink-tailed Worm Lizard, Little Eagle, Murray Cod, Austral Toadflax, Murrumbidgee Bossiaea and Tuggeranong Lignum. There is also a low likelihood of occurrence probability of Trout Cod and Macquarie Perch in the Western Edge Investigation Area.

Species in river corridors are particularly at risk from development in the Western Edge Investigation Area, which includes the Molonglo and Murrumbidgee Rivers and their confluence. Large parts of the investigation area are currently under rural use with a history of clearing, and subsequently, remnant ecological values have been highly modified.[46]

River corridor reserves are long and narrow with convoluted edges, which are features that present challenges due to increased edge effects. This effect has been lessened on the northern ACT stretch of the Murrumbidgee (downstream of the confluence with the Molonglo) since a buffer including Natural Temperate Grassland, Box-Gum Grassy Woodland, and Pink-tailed Worm-lizard habitat has been implemented alongside the river corridor at the Ginninderry development site. Meanwhile, the Molonglo River corridor, under plans currently being implemented, will soon be hemmed in on both sides by Denman Prospect and Molonglo Development Stage 3, which will have downstream impacts on the Murrumbidgee.

The Molonglo River corridor currently supports the highest densities and largest known populations of Pink-tailed Worm-lizards. The ACT populations are nationally significant; the Molonglo population, in particular. Crucially, the river corridors currently provide connectivity between the Molonglo and Murrumbidgee River populations and near-urban populations (e.g. at Kama Nature Reserve and west Belconnen), whereas the populations protected in the reserve network are isolated. Development in the Western Edge Investigation Area will likely result in loss of habitat, direct mortality and reduced connectivity, with flow on effects to population genetics.

During construction, the major impacts on waterways are to be expected in the form of run-off and deposition of sediment, as has already occurred extensively in the construction of Denman Prospect and Whitlam. The Suburban Land Agency has implemented learnings from improved sediment and erosion measures at Whitlam, and carried these through to its future developments. However, some degree of sedimentation is unavoidable when undertaking large-scale construction.

46 Capital Ecology, 2021. *Western Edge Investigation Area – Preliminary Ecological Review*. Prepared for the Environment, Planning and Sustainable Development Directorate, ACT Government.

Molonglo River. Source: Ryan Colley

Post construction, impacts are likely to include changes to the hydrologic regime, particularly the rapid delivery of storm runoff leading to erosive high peak flows scouring beds and banks. The Western Edge Investigation Area has sodic soils, which are highly susceptible to erosion. This is a significant issue for peri-urban development.

Urbanisation of the area would also result in large quantities of urban stormwater contaminants being delivered to waterways including sediments, nutrients, and urban pollutants such as gardening fertilisers, biocides, pathogens, fuel, oil, heavy metals and microplastics from roadways and carparks.

The endangered Murray River Crayfish is under stress from pollution and sedimentation, partly due to recreational activities and agricultural runoff along the Murrumbidgee River. These threats are exacerbated by urban development, which can increase sediment and nutrient loads in waterways, leading to decreased water quality and lowered dissolved oxygen levels. This degradation of water quality presents a direct threat to the health and reproduction of this species, which requires stable, unpolluted aquatic habitats.

Murray River Crayfish. Source: Mark Jekabsons

Expert comment

Managing waterways for a growing Canberra

Professor Fiona Dyer, Professor in Water Science with the Centre for Applied Water Science and the Institute for Applied Ecology, University of Canberra

There is an inherent attraction in living close to a river. Perhaps it is our deep-seated need to have a secure supply of water to sustain life and grow food or the opportunity that waterways provide for transport and recreation, but for eons rivers have held a special place in the lives of humans. Most major cities around the world are situated on rivers or lakes. This is not without its challenges. Until the late 19th century, rivers in cities were the conveyors of sewage and industrial waste, places of disease and foul smells. While we have learnt to better manage the waste in our cities (implementing sewage systems, garbage collection and replacing horses with cars), urban areas still have a major impact on water quality.

Cities change flow pathways, and it is common for urban streams to be lined with concrete to reduce erosion and ensure that water is moved efficiently away from homes. While this reduces flood risks and prevents damage to infrastructure, it means that the streams lack the processes that would naturally maintain good quality water. As a consequence urban streams frequently have high concentrations of sediment, nutrients and pollutants (like litter and heavy metals). This has poor outcomes for our freshwater systems; in Canberra, we are all too familiar with the cyanobacterial (blue-green algae) blooms in our urban lakes and ponds that occur as a result of high concentrations of nutrients being washed in from our suburbs.

There are a range of approaches for mitigating the water quality impacts of a city on its rivers. In Canberra, we have built urban wetlands and ponds that effectively trap a portion of the sediment, nutrients and pollutants under low flow conditions. We have

large urban lakes that are used to manage higher flows. These engineering works are expensive to build and maintain. There is now increasing recognition that the community can play a part in improving water quality. Engaging the community in helping to ensure that sediment, nutrients and other pollutants are kept out of our stormwater network will be a key part of maintaining and improving water quality into the future as well as keeping the costs down.

The population of Canberra is growing and with it the demand for new housing and suburbs. Over the past 35 years the urban footprint of Canberra has grown by 50 per cent, extending the boundaries of our city across farmland and toward nature reserves. Recently, our residential areas have begun to extend to the west, with greenfield developments bringing the city along the Molonglo River corridor and toward the Murrumbidgee River. Projected development along the "Western Edge" of Canberra would develop the city right up to and along more than 20 km of the Murrumbidgee River corridor. It is a requirement that new suburbs incorporate design features to manage stormwater and improve water quality. Such features are capital expensive and there are limitations to what they can achieve, but, without them, the water quality impacts of urbanisation would be far greater and more detrimental to our rivers.

There are significant planning and design challenges around including features in our suburbs to manage water quality. Developments on the western edge of Canberra that drain directly into the Molonglo and Murrumbidgee Rivers are constrained by the steep landscape which has little room for traditional wetlands, ponds and lakes. Additionally, these developments are below the existing major lakes which trap sediment, nutrients and pollutants, which means that the suburbs have the potential to adversely impact the rivers that are a key selling point for the suburbs. We will have to be creative and innovative in the approaches we use to manage water quality in these developments. It is likely to be expensive, but the ability to enjoy our local rivers into the future depends on us getting it right.

One of the most difficult water quality impacts to manage occurs with the initial development of suburbs. Construction activities make the land surface particularly vulnerable to erosion and soil eroded during urban construction is a major source of sediment to urban waterways, with a detrimental impact that can last many years. Aerial imagery of the detention ponds associated with urban construction activities attests to the sediment leaving construction sites in the ACT (see pictures below). There are a range of mitigation measures that can be implemented during construction but they are often poorly implemented and maintained, with potentially catastrophic consequences for nearby rivers. Even some of the great examples of local developments that have made a genuine concerted attempt to follow best practice construction site management still have water quality impacts.

Much of the erosion of sediment from construction sites occurs during rainfall events and even the best of control measures will struggle during heavy rainfall. There is a need to improve on current best practise and future developments need to better consider the impacts of sedimentation and be held accountable for minimising the downstream impacts. As our climate changes and there are more and more intense storm events. This is going to be an increasing issue for building new suburbs or large construction works in existing suburbs. This will require attention across the planning and regulatory systems as well as input from innovative practitioners and researchers.

Unfortunately, this will be more costly for the development, but failing to invest passes the cost of clean-up to a future generation.

Population increases and the demand to have land for housing comes at a cost. This is a point of tension in a world where housing affordability is a key concern for the community. There is a need for a conversation with our community that recognises that the very process of building suburbs near the rivers we love has the potential to do long term damage to these rivers. This is particularly important as a changing climate will make our waterways even more attractive, and yet harder to maintain, for people who want to enjoy the cool of water and the shade of a healthy riparian zone. We need to be far smarter and diligent about the way in which we develop areas, developing sensitively and carefully, ensuring the quality of water in our rivers and the health and amenity of those rivers into the future.

Aerial images of urban constructions areas in Taylor (upper image) and Denman Prospect (lower image). Note the colour of the water in the ponds downstream of the construction areas indicating high turbidity from sediment.

Source: Google Maps.

8

A future for the "Bush Capital"

Construction in Denman Prospect. Source: Ryan Colley

8. A future for the "Bush Capital"

So far, this Investigation has examined the ways in which urban development policies have impacted biodiversity in the ACT. In this chapter, a future vision for Canberra is proffered. In presenting this vision, attention is given to broader social and economic factors alongside environmental considerations.

Contemplation of the future of the ACT must consider a range of questions, such as:

i. How do we halt and reverse biodiversity loss in Canberra?

ii. How can nature be valued and funded accordingly?

iii. How can urban development approaches sufficiently consider environmental, social and economic factors?

iv. Under current legislation and policy, will the Canberra of 2050, 2060 and beyond still be the "Bush Capital"?

This chapter explores this vision and these questions. It identifies specific problems, articulates current approaches that cannot be continued if different environmental outcomes are sought, and provides examples of alternative approaches to those employed during the last decades of urban planning and conservation.

Pelicans at Jerrabomberra Wetlands. Source: Richie Southerton

8.1 Can cities be liveable, sustainable and healthy?

Canberra – like other Australian cities – faces a range of challenges it must manage. These include population growth, decreasing housing affordability, growing inequalities and social disadvantage, traffic congestion and limited public transport investments.[1] These issues are in addition to the impact of urban sprawl on natural environments. Cities can be seen as interrelated systems, comprising complex social–ecological–technological spheres. Strategic planning and development requires consideration of all these facets of the city, and requires that Government:

1. Manages the urban growth of Canberra effectively.
2. Designs urban environments to facilitate the health and wellbeing of Canberrans.
3. Prioritises fast and reliable public transport within and between urban centres.
4. Supports urban design that embeds high quality greenspace as a priority in the planning process.

Urban greenspace near medium density housing.
Source: EPSDD

These considerations are not inherently in competition with each other. The natural environment brings not just biodiversity and climate resilience, but also social amenity and associated economic benefits. Greenspace within our urban environment also holds immense health, social and economic benefits for the city and its residents.[2] The multiple benefits of urban greenspace include reduced morbidity and improved physical health outcomes, improved mental wellbeing and increased social cohesion.[3] As a result, the health sector is increasingly recognising the natural environment as a cost-effective tool for planning healthy cities.[4] There is also a clear economic value that we obtain from nature. Research has shown that street trees are highly valued by urban residents, which can be ascertained from the value of residential properties. An analysis of Perth shows that broad-leaved trees on a street verge increase the median property price by more than $16,000.[5]

Just as the economic value of nature is clear, the economic costs of urban expansions are measurable. A comparative cost study of the service delivery of utilities and infrastructure to greenfield and infill developments in the ACT reveals these costs.[6] This study finds that there are significant capital and ongoing investments required to enlarge the footprint of

1 Webb, R., Bai, X., Smith, M.S. et al, 2018. *Sustainable urban systems: Co-design and framing for transformation.* Ambio, 47(1), 57–77.

2 ACT Government, 2020. *Report 10 – Standing Committee on Environment and Transport and City Services – Inquiry Into Nature In Our City*. Available at: https://www.parliament.act.gov.au/__data/assets/pdf_file/0005/1480091/9th-ETCS-10-Inquiry-into-Nature-in-Our-City.pdf

3 Kendal, D., Lee, K., Ramalho, C. et al, 2016. *Benefits of Urban Green Space in the Australian Context: A synthesis review for the Clean Air and Urban Landscapes Hub*. Available at: https://nespurban.edu.au/wp-content/uploads/2018/11/CAULHub_BenefitsUrbanGreeningReport_20160912.pdf

4 Shanahan, D. F., Lin, B. B., Bush, R. et al, 2015. *Toward Improved Public Health Outcomes From Urban Nature*. American Journal of Public Health, 105(3), 470–477.

5 Pandit, R., Polyakov, M., Tapsuwan, S. et al, 2013. *The effect of street trees on property value in Perth, Western Australia*. Landscape and Urban Planning, 110(1), 134–142.

6 AECOM, 2018. *Greenfield and infill developments in the ACT: Comparative cost study*. Prepared for the Environment, Planning and Sustainable Development Directorate, ACT Government. Available at: https://www.parliament.act.gov.au/__data/assets/pdf_file/0016/1360600/Answer-QToN-5.pdf

the city. Infrastructure costs per dwelling tend to decline as the density of development on-site increases. As such, there are large costs associated with connecting infrastructure for greenfield areas, where density is typically lower. Any greenfield land release requires building new connecting infrastructure – like utilities and roads – as well as providing new schools and social infrastructure. This includes the provision of bus stops, cycle paths and supporting transport infrastructure, electrical, water, sewer and stormwater, and communications infrastructure. The costs are substantial on a per building or per capita basis.

This comparative cost analysis also notes that future land releases are likely to involve more challenging sites which may increase costs and lower block yields. Greenfield expansion of the ACT to the west and south will potentially involve steeper site gradients, greater bushfire setbacks and abatement controls, new bridge crossings and flood mitigation works. These are likely to further increase the cost of greenfield development. Overall, land developments which provide denser forms of housing can generally capitalise on lower infrastructure installation and servicing costs. This is particularly achievable in infill settings. Compact cities are economically sustainable.[7]

Urban greenspace near medium density housing.
Source: EPSDD

Just as good urban design can provide for the natural environment, social amenity and economic returns, poor urban design often has multiple negative impacts. This principle applies equally to both greenfield and poorly considered infill developments that do not serve Canberra's housing needs and negatively impact the environment. For example, urban design characterised by limited greenspace and poor housing quality has been linked to adverse mental health outcomes.[8] Poor planning of accessible walking and cycling infrastructure in suburbs can reduce physical activity, with physical and mental health implications. Inadequate urban planning can lead to traffic congestion, pollution, longer commute times and increased barriers to accessing services. Urban design that does not meet the needs of the community in price and function can deter or exclude those seeking housing.

Urban expansion is often justified by an urgent need for affordable housing. However, the current system of housing, planning and transport in the ACT has led to a situation characterised by a considerable lack of affordable, accessible and social housing.[9] The urban expansion of Canberra's footprint has not led to a city in which housing is accessible and affordable.

7 Rode, P., 2018. *Governing Compact Cities: How to Connect Planning, Design and Transport*. Edward Elgar Publishing, Cheltenham.
8 Rautio, N., Filatova, S., Lehtiniemi, H. et al, 2018. *Living environment and its relationship to depressive mood: A systematic review*. International Journal of Social Psychiatry, 64(1), 92–103.
9 ACT Council of Social Services, 2022. *Submission: Draft Planning Bill*. Available at: https://actcoss.org.au/wp-content/uploads/2023/01/2022-submission-Draft-Planning-Bill.pdf

Expert comment
Canberra – A city in a landscape
Emeritus Professor Barbara Norman, University of Canberra

The national capital Canberra and the surrounding region are expected to accommodate significant urban growth by 2050; recent estimates are that the ACT will reach over half a million people by 2027.[10]

Managing future urban growth in a sustainable way that is both climate resilient and equitable requires a coordinated approach by governments at all levels and an investment in strategic planning, smart infrastructure and climate-resilient built and natural environments.

The city of Canberra is often described as *"a city in a landscape"* and is in a unique position to develop in an environmentally and socially just way with careful guidance and appropriate planning. Its planned legacy, extensive bushland and open space system provide a strong foundation for a sustainable pathway forward. The immediate surrounding rural lands add to its future resilience with rural food production and tourism.

Challenges

However, there are significant challenges facing the ACT in implementing a climate resilient and inclusive Canberra. These include:

1. access to affordable housing options
2. developing climate resilient development – in both design and construction
3. emerging cross-border developments that requires servicing
4. providing an efficient electric transit system for all, and
5. access to walkable and cycling paths for active living.

The above challenges highlight the need for a more integrated approach to managing future urban development and a regional spatial plan for urban settlement. In the absence of the regional plan for the Australian Capital region there will be increasing pressure for urban fringe development and ad hoc cross-border developments away from existing urban centres, with significant and continuing costs to the ACT, NSW and local governments.

Opportunities

There is a sustainable pathway forward.

This involves the consolidation of future urban growth within existing urban centres in the ACT and the surrounding region, maximising the use of infrastructure and services, encouraging medium density mixed use developments and through increasing local demand, expanding the range of local activities and services.

The implications of urban consolidation are the need to better plan the urban fringe, to enable appropriate and timely urban renewal of the ageing middle suburbs and to strengthen the central activity centres. The benefits include reducing further urban sprawl and with that protecting the open space system of Canberra, improving the

10 ACT Government, Treasury, 2022. *Latest ACT Population Projections*. Available at: https://www.treasury.act.gov.au/snapshot/demography/act

viability of local centres, providing increased affordable housing options, and more local active travel such as walking and cycling.

Key actions for implementing more sustainable urbanisation in the renewal of suburbs include urban design, precinct planning and community engagement. The ACT has made some positive steps with increasing landscape controls in the new suburbs and the potential for improved urban design outcomes in development controls with planning reforms. Monitoring and evaluation of these steps going forward is critical to effective implementation.

Too often urban policy objectives are presented as in conflict whereas there is often a solution that provides multiple benefits. For example, there is significant demand for affordable housing in the ACT, and there is a community that supports action on climate change. These can be achieved by planning for and allowing increasing climate resilient development around existing urban centres which have existing access to services. Leading practice in *"climate resilient development"* can be facilitated by precinct planning supported by the training of the development industry in carbon neutral development options and appropriate regulations.

Maintaining the urban environment alongside increasing development is another challenge. Too often we see a block of land clear felled for a new development only to witness the planting of a few trees after the development has been completed. *"Working with nature"* in managing future urban growth that designs the built environment to enhance the natural environment is essential to a healthy neighbourhood and living with future climate change. Again, the ACT is well placed to achieve a sustainable solution.

Singapore is a well-documented example that has experienced substantial urban growth in a small space and increased its level of biota at the same time.[11] In every development decision, there is an investment in greenery through landscape and water sensitive urban design such as roof gardens and green buildings, storm water harvesting and landscaping the public domain. This has occurred over a 50-year program. More recently, Singapore's "Garden City Campaign" and "Gardens by the Bay" development have further educated the community on the benefits of a healthy green environment and provided seedstock and plants for local use. Again, multiple objectives can be achieved by providing a more climate resilient and attractive urban environment for both people and place.

The ACT community has a long history of very active involvement in the planning and development of its city and hinterland. Active engagement of First Nations peoples is essential in all land use planning and decisions affecting their traditional lands; this needs to be mainstreamed across the urban development processes.

11 United Nations Environment Program, 2018. *"A city in a garden": Singapore's journey to becoming a biodiversity model*. Environment Under Review, published on 30 July 2018. Available at: https://www.unep.org/news-and-stories/story/city-garden-singapores-journey-becoming-biodiversity-model

Sustainable urbanisation is a global challenge with the world urban population estimated to grow by 2.5 billion by 2050.[12] Similarly, the Australian population is expected to grow to 40 million between 2050 and 2060. The ACT will be a part of this and can demonstrate excellence as a model to share with comparable cities in our wider region. A few key directions will facilitate this:

1. a more regional approach to the pattern of urban settlement
2. a program of urban renewal of the suburbs with well-designed medium density development providing affordable housing options
3. an integrated approach to urban growth to achieve healthy, resilient, connected and inclusive urban communities
4. active involvement of First Nations peoples in the process of land use planning and decisions, and
5. mandatory consideration of climate change in all land use planning to reduce both emissions and adapt to the projections of a hotter and drier ACT

Capacity building in urban design, climate resilient development and community engagement including with First Nations peoples is essential in the process of sustainable urbanisation. Climate resilient urban plans will soon be necessary for all urban communities. The ACT, working with the surrounding region, can lead the way.

Pelicans at Jerrabomberra Wetlands. Source: Richie Southerton

12 Hague, C., Harridge, C., Julyan, B. et al (eds.), 2023. *Planning, Sustainable Urbanisation and the Commonwealth*. Routledge, New York.

8.2 How do we develop for better outcomes?

8.2.1 Community participation in planning and decision-making

In this section, examples of urban developments that have prioritised environmental outcomes are presented. It is important to note that environment-focused outcomes often result from strong community involvement and advocacy. As such, before exploring cases in which environmental outcomes have been prioritised from the outset, the case studies below showcase how outcomes may be improved during the development application process through effective community campaigning.

100 community objections to the Lawson Grasslands development

Strong community campaigning for the Lawson Grasslands has led to a significant reduction in the development proposed to take place there. This ongoing campaign to protect the site and the species it holds illustrates the power of communities to challenge environmentally destructive developments and create better outcomes for threatened species.

Lawson Block 1, Section 16 and Block 2, Section 14 were formerly used as the Belconnen Naval Transmitting Station, and are now known as the Lawson Grasslands. The Lawson Grasslands holds one of the key areas of Natural Temperate Grassland (NTG) of the South Eastern Highlands in the ACT, with approximately 100 ha of intact habitat.[13] NTG is a nationally protected ecological community and is considered a Matter of National Environmental Significance (MNES) under federal legislation, and was listed as *critically endangered* in 2016.

Less than 90 per cent of its original extent remains across Australia, and less than 0.5 per cent of the total extent remains in good condition. A number of threatened species are dependent on NTG as a habitat, including the Golden Sun Moth and the Pink-Tailed Worm-Lizard.[14] The Lawson Grasslands also contains the nationally protected ecological community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland (BGW), encompassing the ACT's Yellow Box-Red Gum Grassy Woodland.[15]

Community members gathering as part of the Save Lawson Grasslands campaign.
Source: Conservation Council ACT Region

Lawson North, in the Belconnen Region, encompasses the Lawson Grasslands, and is owned by the Commonwealth Government. As Commonwealth land, it is subject to Federal legislation and to Development Control Plan 12/09, managed by the National Capital Authority.[16] This plan sets out indicative development precincts in particular areas, and areas for heritage and conservation.

13 Conservation Council ACT Region, 2022. *Submission to the Minister for the Environment and Water: EPBC Referral – Lawson North Residential Development (2022/09298)*, Appendix A: Joint Letter to DHA. Available at: https://conservationcouncil.org.au/wp-content/uploads/Conservation-Council-ACT-Region_Lawson-North-Residential-Development.pdf

14 Australian Government, Department of the Environment and Energy, 2016. *Natural Temperate Grassland of the South Eastern Highlands: a nationally protected ecological community*, p.9. Available at: https://www.dcceew.gov.au/sites/default/files/documents/natural-temperate-grassland-se-highlands-guide.pdf

15 ACT Government, Environment, Planning and Sustainable Development Directorate, n.d. *Yellow Box-Blakely's Red Gum Woodlands*. Available at: https://www.environment.act.gov.au/nature-conservation/conservation-and-ecological-communities/protecting-woodlands

16 National Capital Authority, 2013. *Lawson, Block 2 Section 6 & Block 1 Section 16 – DCP 12/09*. Available at: https://www.nca.gov.au/planning/planning-act/special-requirements-and-development-control-plans/approved-dcp/lawson-block

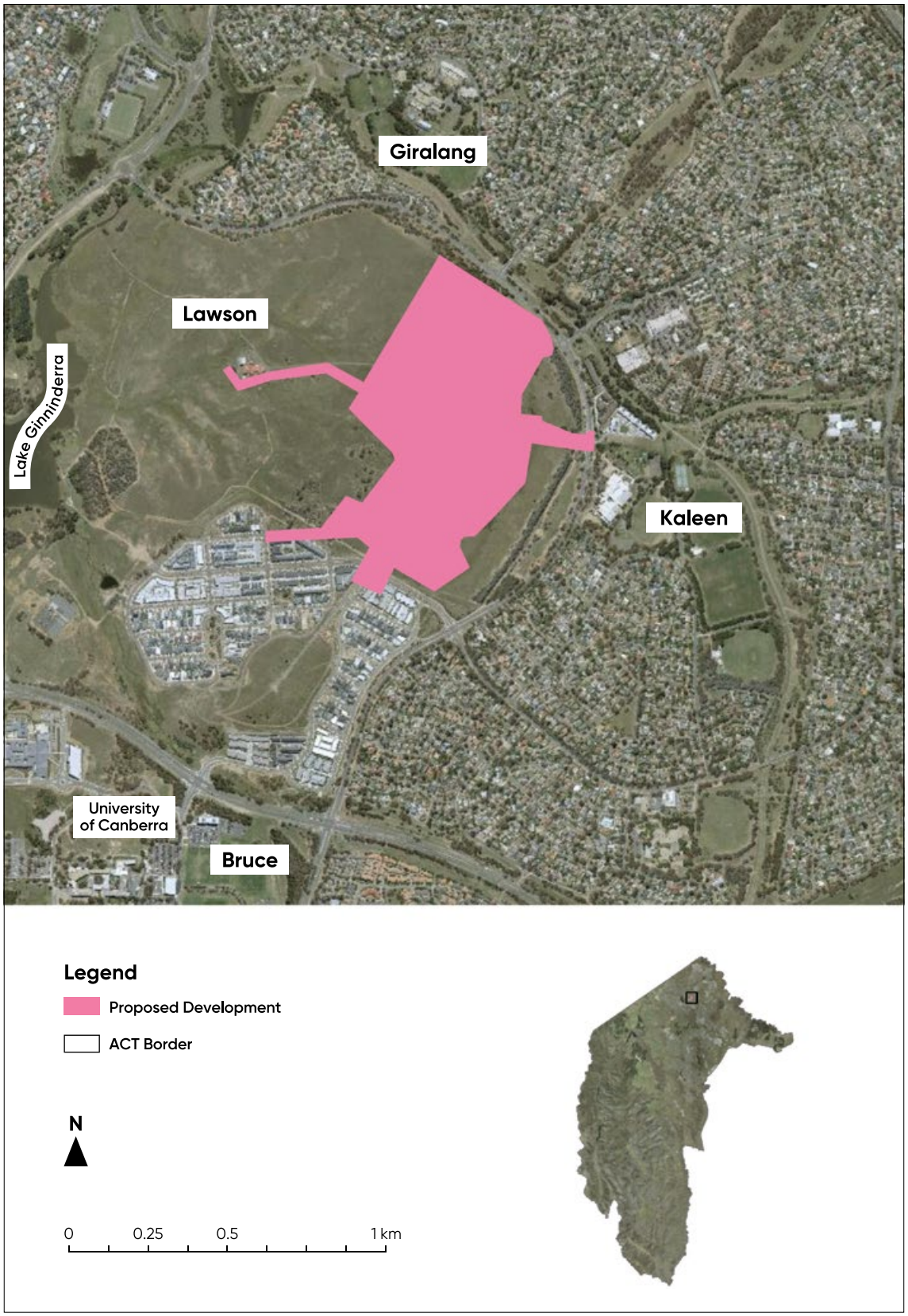

Figure 8.1. Proposed area of residential development in Lawson at May 2022. Source: Map production and area assessments were undertaken by Geospatial Intelligence Pty Ltd

In May 2022, the Defence Housing Australia (DHA) lodged a proposal for a residential development for consideration under the EPBC Act (referral 2022/09298).[17] The proposal would provide upwards of 400 dwellings, with only 150 for Defence families and the rest to be sold to the general public. The proposal was referred under the EPBC Act as it was likely to impact a number of MNES, including Natural Temperate Grassland and Box-Gum Grassy Woodland, and animals such as the Golden Sun Moth and Striped Legless Lizard. It may also have impacted species listed under the ACT's *Nature Conservation Act*, including the Perunga Grasshopper and Scarlet Robin.[18]

The proposal was to:

- clear up to 15.8 ha of Natural Temperate Grassland
- clear up to 1.31 ha of box gum woodland
- remove up to 11.6 ha of known and potential Golden Sun Moth habitat
- remove up to 26.53 ha of Striped Legless Lizard habitat.

Lawson. Source: Richie Southerton

These actions were all anticipated to have a significant impact on each species. There was strong community opposition to this proposal. Organisations such as the ACT Conservation Council and Friends of Grasslands campaigned strongly on the proposed ecological impacts, inadequate buffer zones, and insufficient assessment of natural values. The referral received 100 public comments.

As a result, in October 2022, the project was identified as a controlled action (i.e. that it will or is likely to have a significant impact on MNES),[19] and that it would need to be assessed and approved under the EPBC Act before it could proceed.[20] The Department of Climate Change, Environment, Energy and Water (DCCEEW) issued a Statement of Reasons[21] outlining the decision, and the approach to consider the proposal under an Environmental Impact Assessment (EIA). The Statement of Reasons raised concerns relating to the environment including:

- the scale of the potential impact on NTG, Golden Sun Moth and Striped Legless Lizard, and other vulnerable species, and
- potential impact on other species such as the Gang-gang Cockatoo, Superb Parrot and Key's Matchstick Grasshopper, for consideration in the EIA.

17 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2022. *Lawson North Residential Development*, Referral Summary. Available at: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/?id=789e2990-eafb-ec11-82e6-002248d3bda7

18 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2022. *Lawson North Residential Development Referral Notice*. Available at: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/project-decision/?id=96f2ae4c-0524-ed11-9db1-00224818aa41&refentity=incident&refid=789e2990-eafb-ec11-82e6-002248d3bda7&refrel=mara_projectdecision_project_Incident

19 Australian Government, Department of Climate Change, Energy, the Environment and Water, n.d. *Decisions on referred actions under the EPBC Act*. Available at: https://www.dcceew.gov.au/environment/epbc/advice/decisions-on-referred-actions

20 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2022. *Notification of referral decision, designated proponent and decision on assessment approach – controlled action.* Available at: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/project-decision/?id=ab918460-0524-ed11-9db1-00224818a3ef

21 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2022. *Statement of reasons for a Decision on a Controlled Action and a Decision on an Assessment Approach under the Environment Protection and Biodiversity Conservation Act 1999*. Available at: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/project-decision/?id=ec12765c-8981-ed11-81ad-00224818aa41

In relation to the offset site, in their advice to the federal department on the proposal, the ACT Conservator of Flora and Fauna noted information they had received that "the Lawson population of the Ginninderra Peppercress may be extinct and almost certainly has undergone significant decline. This is likely due to a lack of suitable disturbance on the site, causing a change in vegetation structure and an increase in weeds". The Conservator stated that "the fact that this site is a proposed offset for the DHA development makes this decline even more concerning and raises further questions about the suitability of the site as an offset".[22]

Following this decision, in December 2023 Defence Housing Australia submitted a revised application that significantly reduced the scope of the project, almost halving the project area by reducing it by 23.11 ha (from 47.16 ha to 24.05 ha) and addressing concerns regarding the level of impact on biodiversity and heritage values.[23]

The threatened species Polytelis swainsonii *(Superb Parrot).* Source: OCSE

While the EPBC referral process has been ongoing, community members have noted the poor management of the site by DHA. OCSE has received advice and viewed rubbish dumping and poor weed management on the site. Further, access to the site has been allowed by removing road blocks, which could potentially impact on the vulnerable species within. OCSE has concerns about ongoing poor management of areas like this, allowing for the threatened ecological communities to degrade and potentially no longer fit the criteria for listing.

Lawson. Source: EPSDD

DHA's website suggests their Environmental Impact Statement is expected to be completed in 2025; once the draft is amended (if needed) following public comment, the project's approval will be considered by the Minister under the EPBC Act. Further objections from the community are likely given the expected environmental impact of the revised proposal on Natural Temperate Grassland and Striped Legless Lizard – meaning there is more work to be done ahead. Nevertheless, the gains achieved so far are a testament to the community's commitment to push for better environmental outcomes at the Lawson Grasslands

22 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2022. *Statement of reasons for a Decision on a Controlled Action and a Decision on an Assessment Approach under the Environment Protection and Biodiversity Conservation Act 1999*, p.9. Available at: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/project-decision/?id=ec12765c-8981-ed11-81ad-00224818aa41

23 Defence Housing Australia, 2023. *Request for a Section 156A variation for the proposed Lawson North residential development (EPBC 2022/09298)*. Available at: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/project-decision/?id=0c5a01ba-ec9d-ee11-be37-0022489332fb

Federal examples of community advocacy in action

The example above is a recent and local example of community investment in improving the environmental outcomes of development decisions. There are many such examples across jurisdictions of varying scales. High profile case studies include Queensland's Toondah Harbour and Traveston Dam projects, where decisions favouring environmental outcomes were made after significant public outcry about the proposals' environmental impacts.

Cleveland's Toondah Harbour project would have destroyed about 50 ha of mangroves and mudflats in the Ramsar site to make way for 3,000 apartments, a 400-berth marina, retail outlets and a hotel.[24] The planned development of the protected wetlands in Queensland has been scrapped almost 10 years after first being proposed. In April 2024, developers withdrew from the project before it could be officially refused by federal Environment Minister Tanya Plibersek.

Years prior, federal Environment Minister Peter Garrett made his final decision on the Traveston Crossing Dam proposal, determining that the project could not be approved due to likely unacceptable impacts on nationally threatened species.[25] The decision followed receipt of thousands of submissions from conservationists, wildlife experts, business groups and nearby councils, and a Senate inquiry in 2007.

These examples of advocacy, negotiation, compromise and protest demonstrate that stakeholder and community involvement is essential in urban planning and development. Decision-makers must:

- understand the values of the community they work in
- see community input as fundamental to the development of good policy, and
- include the community in urban strategy and planning.

Expert comment
The rights of Indigenous peoples
Associate Professor Cristy Clark, University of Canberra

It is essential that First Nations peoples in the ACT play a central role in the government's policy development, including the implementation of the right to a healthy environment. As the Environmental Defender's Office have noted:

> *Because of the intimate spiritual and cultural connections that First Nations have to their lands, waters, territories and resources, they are particularly at risk of harm from destroyed, degraded and polluted environments. The right to a healthy environment must be applied based on the principle of non-discrimination and the recognition that First Nations are distinct peoples with collective rights, including the right to self-determination and the right to culture. This means recognising that there is an intimate and interdependent relationship between a right to a healthy environment and the right to culture for First Nations and that the right to a healthy environment*

24 Australian Government, Department of Environment and Energy, 2018. *Notification of referral decision and designated proponent – controlled action; decision on assessment approach – environmental impact statement. Toondah Harbour Development, Queensland (EPBC 2018/8225)*. Available at: http://epbcnotices.environment.gov.au/_entity/annotation/aa313a19-dc8e-e811-95dc-005056ba00a8/a71d58ad-4cba-48b6-8dab-f3091fc31cd5?t=1554650148615

25 Australian Government, Department of the Environment and Energy, 2011. *Traveston Dam – the federal process*. Available at: https://www.environment.gov.au/epbc/notices/assessments/2006/3150/traveston-dam-the-federal-process.html

includes respecting and protecting these spiritual and cultural connections to the environment. A healthy environment, and the wellbeing, health and cultural identities of First Nations, are bound together and this interdependence is protected by a right to a healthy environment.[26]

This was echoed in the responses to the ACT Government's 2022 consultation on the right to a healthy environment, where "[s]ome participants said that there should be consultation with First Nations people and consideration of collectivist world views, the cultural significance of 'country' [sic] and traditional land management practices".[27] Participants also emphasised the need to "include Aboriginal and Torres Strait Islander people in decision-making processes regarding lands, waterways and resources; [and] employ a decolonising approach to environmental decision making".[28]

It is increasingly widely acknowledged that Indigenous peoples are on the frontline of the struggle for climate justice and that their expertise will be important in building a sustainable future for all of us.[29] In 2019, for example, the Intergovernmental Panel on Climate Change (IPCC) noted that:

Indigenous and local knowledge (ILK) can play a key role in understanding climate processes and impacts, adaptation to climate change, sustainable land management (SLM) across different ecosystems, and enhancement of food security (high confidence). ILK is context-specific, collective, informally transmitted, and multi-functional, and can encompass factual information about the environment and guidance on management of resources and related rights and social behaviour. ILK can be used in decision-making at various scales and levels, and exchange of experiences with adaptation and mitigation that include ILK is both a requirement and an entry strategy for participatory climate communication and action.[30]

Less frequently acknowledged is the fact that many environmental protection mechanisms serve to breach the human rights of Indigenous peoples, because they fail to acknowledge the embeddedness (or deep entanglement) of humanity with the rest of the ecosystem. A decolonising approach to environmental decision-making must be informed by an acknowledgement that people are part of Country and that all measures should work to strengthen healthy relationships between people and Country.

26 Environmental Defenders Office, 2023. *A Healthy Environment is a Human Right: Report on the Status of the Human Right to a Healthy Environment in Australia*, p.12.

27 ACT Government, 2022. *Your Say Report – Right to a Healthy Environment – Report on What We Heard*, p.2. Presented by Tara Cheyne to the Legislative Assembly for the Australian Capital Territory.

28 ibid.

29 See for example: Environmental Justice Australia, 2023. *First Nations Justice*. Available at: https://envirojustice.org.au/legal-work/first-nations-justice/; Giacomini, G., 2022. *Indigenous Peoples and Climate Justice: A Critical Analysis of International Human Rights Law and Governance*. Palgrave Macmillan, Cham; Good Stefani, G., 2021. *Indigenous Leaders at the Frontlines of Environmental Injustice and Solutions*. NRDC, published 11 October 2021. Available at: https://www.nrdc.org/bio/giulia-cs-good-stefani/indigenous-leaders-frontlines-environmental-injustice-and-solutions; United Nations, Department of Economic and Social Affairs, 2008. *Indigenous Peoples: Climate Change*. Available at: https://www.un.org/development/desa/indigenouspeoples/climate-change.html.

30 Intergovernmental Panel on Climate Change, 2019. *Special Report on Climate Change and Land*, Chapter 7: Risk management and decision-making in relation to sustainable development.

8.2.2 Can urban development be environment-centred?

Singapore: the greenest city in Asia and another planned city

The 'Garden City' of Singapore. Source: Coleen Rivas

Development of the "garden city" of Singapore is guided by a Master Plan[31] – a statutory land use plan focussed on medium-term development over the next 10–15 years. The plan is reviewed every five years and helps interpret long-term strategies as detailed plans to guide the development of land and property. The Master Plan details permissible land uses, densities and priorities. The 2019 version focused on creating green and sustainable neighbourhoods.

Singapore has a long history of urban planning as a tool to optimise land use. The first urban planning framework commenced in 1822 with the "Jackson Plan". This town plan was developed in response to prior haphazard development and was based on a vision that Singapore would be "a place of considerable magnitude and importance". This vision meant that "an economical and proper allotment of the ground intended to form the site of the principal town [was] an object of first importance".[32]

Singapore is a small, densely populated, urbanised island nation. As Singapore's population grew over the most recent decades, so did green cover. It is ranked as the greenest city in Asia over measures of energy usage, land use and buildings, transport, air quality, waste and greenspace. Singapore ranks above average in all index categories, with particularly strong results for its large amount of greenspace per person.[33]

There are notable parallels between Singapore and Canberra. In particular, both are self-described planned cities and prosperous city states. Singapore's consistently exceptional environmental performance and increasing green cover is the result of prioritising sustainability as its population has grown. The climate of Canberra is notably very different from tropical Singapore's, which is plainly well suited to rapid greening. While Canberra could not directly emulate the approach used in Singapore, this example does demonstrate the environmental outcomes of sustained and purposeful efforts in urban greening.

31 Urban Redevelopment Authority, 2025. *Master Plan*. Available at: https://www.ura.gov.sg/Corporate/Planning/Master-Plan

32 Tan, B., 2016. *Raffles Town Plan (Jackson Plan)*. Available at: https://www.nlb.gov.sg/main/article-detail?cmsuuid=ed0c1981-882f-42c2-9acf-e5dae577a3ba

33 The Economist Intelligence Unit, 2011. *Asian Green Cities Index: Assessing the environmental performance of Asia's major cities*. Siemens AG, Munich.

Melbourne's urban growth boundary and city renewal

Melbourne. Source: Pat Whelen

Melbourne has a population of over five million people and has undergone substantial economic and population growth, particularly since the 1990s.[34] In 2018, there were 81 cities globally that had a population of five million residents or more.[35] The rapid increase of population in Melbourne's urban area has resulted in pressure to convert undeveloped land to housing. An expanding city also demands land for waste and water management, food production, ecosystem services, recreation, and mineral resources to support urban populations.

In 1971, a boundary containing urban growth was introduced as a statutory planning tool in Melbourne's third strategic plan.[36] The plan set aside green wedge and peri-urban areas outside the urban growth boundary to protect rural activities, the natural environment and other resources as Melbourne developed along major road and rail links. Since 2003, green wedge land has been defined under the *Planning and Environment Act 1987*.[37] This defined an urban growth boundary and a green wedge, and required ministerial approval before councils could initiate planning-scheme amendments. It also required parliamentary ratification for any change to the growth boundary.

There are 12 designated green wedge areas located within the 17 metropolitan fringe local government areas that border Melbourne's urban growth boundary. The green wedges and peri-urban areas are places for food production, tourism, quarries, airports, sewage treatment, water catchment, and waste and resource recovery. Some of Victoria's most productive agricultural land is within Melbourne's green wedge and peri-urban areas, which are within a 100-kilometre radius of Melbourne.[38]

Alongside concerted containment of urban sprawl, Melbourne has undergone a period of urban renewal. This process focuses on existing developed areas that are considered under-utilised and aims to improve amenity, transport and infrastructure through instruments such as planning and rezoning.

34 Macro Trends, 2025. *Melbourne, Australia Metro Area Population 1950–2025.* Data sourced from the United Nations World Population Prospects. Available at https://www.macrotrends.net/global-metrics/cities/206168/melbourne/population

35 United Nations, Department of Economic and Social Affairs, 2018. *World Urbanisation Prospects 2018.* Available at: https://population.un.org/wup/publications

36 Victorian Government, Ministry for Planning and Environment, 1971. *Planning Policies for the Melbourne Metropolitan Region.*

37 Victorian Government, 2003. *Planning and Environment (Metropolitan Green Wedge Protection) Act 2003 (VIC).*

38 Victorian Government, Department of Transport and Planning, 2024. *Planning for Melbourne's Green Wedges and Agricultural Land: Action Plan 2024.*

The Southbank area of Melbourne was part of an urban renewal program commencing in the late 1980s to early 1990s.[39] The area stretches along the Yarra River to the south of the CBD. Prior to this renewal initiative, Southbank was primarily a light industrial area.

Planning for the renewal of Southbank formally began in 1986 and by 1992, a new leisure precinct and major commercial buildings were in place. The Riverside Quay and Southgate developments provided shopping malls, offices, restaurants and cafes. Development of Southbank then focused on establishing a residential precinct due to policy incentivising residential uses. The area is now a densely populated district of high-rise apartment and office buildings in close proximity to major transport hubs and the city centre. Its mixed usages include:

- A high-density residential neighbourhood, with social infrastructure including the Boyd Community Hub, library and park.
- A high-density commercial neighbourhood – Southbank promenade is a major entertainment precinct with many restaurants and hotels.
- A high-density cultural neighbourhood – the Melbourne arts precinct includes the National Gallery of Victoria and Hamer Hall, as well as other galleries, theatres, studios, and arts education institutions.

Melbourne continues to grow and tensions around land use remain. Not all development has occurred in such a strategic and successful way as this highlighted example of renewal. However, the counterfactual – Melbourne without a statutory growth boundary and urban renewal program – would have unequivocally degraded the environmental values and agricultural capacity of the broader region more significantly.

There are also examples from within Canberra of renewal and infill approaches that have contributed to reducing the impacts of urban development on the peri-urban fringe. Examples of densification and renewal in the ACT include:

- The New Acton Precinct, a mixed-use development located between the Australian National University, Civic and the National Museum of Australia. This area underwent major transformation to become a mixed commercial, retail and residential area.[40]

NewActon. Source: Matthew Sherren Photography

- Upgrades and renewal of Braddon, which transformed the suburb from a light industrial area to an entertainment and residential precinct located close to Civic and major transport corridors.[41]
- A benefits realisation study found that the population growth within the light rail corridor was greater than that of the rest of the ACT, with an average population increase of four per cent against 2.5 per cent for the rest of the Territory. This is as a result of urban infill along the light rail corridor, without increasing demand for greenfield sites.[42]

39 Context Pty, 2015. *Southbank Boulevard & Dodds Street Ecological, Heritage and Cultural Place Assessment*. Prepared for City of Melbourne.

40 Jones, B., 2021. *NewActon provides a template for mixed-use precincts*. Riotact, published on 21 November 2021. Available at: https://the-riotact.com/newacton-provides-a-template-for-mixed-use-precincts/504541

41 ACT Government, City Renewal Authority, n.d. *Braddon*. Available at: https://www.act.gov.au/cityrenewal/places/braddon

42 ACT Government, Transport Canberra, 2024. *Light Rail Five Years On: Benefits Realisation Report 2024*.

- An increase in residential high-rise in Woden, where the population almost doubled between 2016 and 2021[43] and with more construction since then.
- A proposal for development on London Circuit in Civic, which would see construction of six buildings including four residential towers, an office, a hotel and a park.[44]

While renewal and infill approaches can be steps towards environment-centred development, they do not inherently guarantee good outcomes. These approaches still require the environment to be a focal point, and need community support and sufficient Government coordination and commitment. A recent example of this is the planning system changes introduced in 2023 that allowed 120 m² secondary dwellings on large suburban blocks.[45] The change affected about 45,000 residential blocks in the ACT. Between November 27, 2023 and November 30, 2024, there were just 33 development applications across 22 suburbs for dual occupancies in RZ1 zones, thus this option has not≈substantively increased infill.

8.3 A broader spatial perspective

Belconnen Town Centre. Source: EPSDD

So far this chapter has identified that future development of the "Bush Capital" can and should appreciate multiple considerations (e.g. social, economic and environmental). Furthermore, future development requires community input and for the environment to be prioritised in planning decisions. Contemplation of the bush capital of the future also requires an expansive perspective of Canberra within a landscape and within a contiguous geographical region. These larger spatial perspectives are explored here.

43 Vyver, J., 2022. *Woden town centre is changing rapidly as high-rise buildings pop up to accommodate a growing population.* ABC News, published on 31 August 2022. Available at: https://www.abc.net.au/news/2022-08-31/act-woden-town-centre-growing-up-quickly/101388192

44 Twyford, L., 2025. *Hundreds of apartments, park, offices and hotel slated for prime Canberra city site near Lake Burley Griffin.* ABC News, published on 20 January 2025. Available at: https://www.abc.net.au/news/2025-01-20/city-hill-development-canberra-lakeside/104836362

45 Lindell, J., 2023. *Dual occupancy rules to expand across larger RZ1 Canberra blocks in planning system overhaul.* The Canberra Times, published on 11 September 2023. Available at: https://www.canberratimes.com.au/story/8342346/dual-occupancy-rules-to-expand-across-larger-rz1-canberra-blocks/; Lindell, J., 2025. *More changes planned for zoning as Steel eyes 'human-scale housing'.* The Canberra Times, published on 6 February 2025. Available at: https://www.canberratimes.com.au/story/8885157/chris-steel-foreshadows-major-changes-to-canberras-zoning-laws/?src=rss&utm_source=sfmc&utm_medium=email&utm_term=1190309&utm_campaign=

8.3.1 A city in the landscape

From the outset, the natural landscape has defined and articulated the design of Canberra, starting with Walter Burley Griffin's plan. The nation's capital has always been envisaged as "a city in the landscape and of the landscape".[46]

> *Underlying the city's spatial structure is the fundamental premise of Canberra as a city in the landscape. Its spatial structure has been progressively and incrementally planned from the beginning to maintain continuity with existing design elements, in particular the hills, ridges, and valleys.*[47]

Retaining the character of Canberra as the bush capital requires careful and deliberate urban planning. The environmental impacts of current approaches are immense and irreconcilable with these visions of a bush capital in a landscape. How can Government reduce the impact of future development on the natural environment? How can Government turn the trend of environmental decline and reverse the losses of invaluable species, ecosystems and communities?

Urban greenspace planning provides essential opportunities to support threatened species and their habitats within cities. By carefully designing greenspaces, cities can create habitats for native flora and fauna, manage invasive species, and ensure the long-term presence of mature trees. This section outlines potential strategies for Canberra to use greenspace to enhance urban biodiversity and conservation.

Planting threatened flora

Future greenspace could be used to plant threatened species and thereby establish new populations in the urban matrix. For instance, Black Gum (*Eucalyptus aggregata*) was planted as part of the Urban Forest Strategy at Acacia Inlet, Lake Burley Griffin. Likewise, the Hoary Sunray (*Leucochrysum albicans*) is commonly cultivated in native gardens. However, this may not be possible for some grassland species or require intensive maintenance to succeed; for instance, only one new population of Button Wrinklewort (*Rutidosis leptorhynchoides*) succeeded despite several attempts to establish new populations.[48] Greenspace could also include food plants for threatened invertebrates, such as native daisies for Key's Matchstick Grasshopper.

Landscaping to mitigate noisy miners

Certain types of urban greenspace can attract an over-abundance of noisy miners. This is particularly true of greenspace characterised by open habitat and nectar-rich plants like Banksia and Grevillea species. Noisy miners aggressively exclude woodland birds and are considered a key threatening process.[49]

46 Taylor, K., 2005. *Living with heritage: Canberra, city in the landscape. Can it remain a city 'not like any other'?* Historic Environment, 19(1), p.36.

47 ibid.

48 ACT Government, n.d. *Button Wrinklewort (Rutidosis leptorhynchoides).* Available at: https://www.act.gov.au/environment/animals-and-plants/act-threatened-species/button-wrinklewort-rutidosis-leptorhynchoides

49 Australian Government, Department of Climate Change, Energy, the Environment and Water, 2014. *Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (Manorina melanocephala).* Available at: https://www.dcceew.gov.au/environment/biodiversity/threatened/key-threatening-processes/overabundant-noisy-miners

Noisy Miners (right) are a common aggressor towards other birds, such as the Swift Parrot shown here.
Source: Ryan Colley

Urban greenspace design can mitigate noisy miner aggression by reducing the number of nectar-rich plants and favouring dense and spiny shrubs (e.g. *Bursaria spinosa*) to provide refuge for small birds. Patches of retained native vegetation should follow the principles of reducing unnatural fragmentation (i.e. larger habitat patches without convoluted edges) since noisy miners prefer fragmented and edge habitats.

Hollows in mature trees support bird life.
Source: Helen Cross

Present and future mature trees

Mature trees are essential components of ecosystems, supporting numerous species. Conserving the biodiversity that depends on these trees and their features, such as hollows, will require a combination of protection, supplementation and recruitment efforts to ensure their continued presence. Maintaining mature native trees requires that they are considered within their ecological context. For example, building close to mature native trees negatively impacts their use by ground dwelling and arboreal fauna.

Thinking outside the block

While continuation of greenfield development is locked in for the short term in the west and north of Canberra, the design and layout of buildings and streets in these new suburbs can heavily influence their capacity to develop into urban areas which also have the capacity to support greenspace and biodiversity. There appears to be a growing trend among new builds for large buildings which take up the majority of the block and leave little room for gardens, and even less for trees which will grow to a size that will provide canopy shade

in the future. Planning and building houses or apartment blocks individually leaves little opportunity to design for larger areas of greenspace and large shade trees. This is the case both in greenfield and infill developments.

One example of a development with small-footprint housing which seeks to integrate greenspace at the precinct level is the Suburban Land Agency's North Wright Sustainable Precinct. This development when fully complete will comprise 43 homes with individual titles on small blocks and with small courtyard gardens. The 23 homes delivered in Stage 1 of the project are architect-designed with compact, flexible floorplans with 'room to grow' and individual blocks allowing for 30 per cent tree canopy and 30 per cent permeable surface. In addition, it has been designed from the outset to include landscaped areas around and between the houses to provide shade trees, greenspace and a mix of native and climate resilient landscaping at the neighbourhood level. This approach means that while residents have their own small, easily-maintained outdoor area, they also benefit from the ecosystem services provided by the much larger shared area surrounding their dwelling with natural cooling and wildlife habitat.

While not possible in every circumstance, this type of thoughtful precinct-level planning for residential developments could provide improved opportunities for enhanced greenspace, canopy cover and community building throughout the city.

8.3.2 The Territory beyond Canberra

The ACT extends beyond the urban environment – highly modified urban land uses account for 10 per cent of the ACT.[50] The remaining ACT Government land is zoned for rural and broadacre use, and as natural ecosystems and greenspace. These land use types are discussed here.

Fenceline with poor weed management on the left (government land) versus the rural block on the right.
Source: OCSE

Conservation on rural lands

Rural landholders manage 15 per cent (40,000 ha) of the ACT. Many rural landholders work to care for the unique environment of the ACT through activities such as protecting key woodland communities, restoring waterways and maintaining ecological corridors. While their environmental work is considerable, their contributions are often under-represented in broader discussions about conservation and environmental management. These contributions are made through the initiative of individual landholders, in partnership with community organisations (e.g. Landcare ACT, Greening Australia, Catchment Groups) and with the support of government-funded programs and grants such as those run by the ACT Natural Resource Management team.

50 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, Land. Available at: https://www.actsoe2023.com.au/themes/land/

As the Caring for Dhawura Ngunnawal: A Natural Resource Plan for the ACT 2022–2042 states:

> *Landholders play an important role in land stewardship and protection of natural values on rural lands, which include more than 40 per cent of lowland woodland communities and many of the ACT's waterways. Most landholders contribute considerable time and expense to protect these natural values and integrate them into farm management. Landholders also play an important role in bushfire reduction and mitigation through strategic hazard reduction grazing.*[51]

The 2023 ACT State of the Environment Report described environmental outcomes achieved on rural leased land.[52] The ACT's system of reserves does not protect all areas of importance to conservation, and many key areas exist on broadacre zoned lands. For example, many important ecosystems exist on rural land in the ACT, including Box-Gum Woodland, a critically endangered ecological community under the EPBC Act. ACT Natural Resource Management's (NRM) Box-Gum Woodlands Project, which involves both on-ground restoration activities and educational outreach components, has seen a high degree of participation from ACT farmers. As at 2023, the project has achieved more than 547 ha of weed control and more than 470 ha of Box-Gum Woodland revegetation across farms and public land in the ACT.

However, there are significant hurdles to biodiversity and conservation activities occurring on rural lands, which limits the potential environmental outcomes. These barriers include lease insecurity. As detailed in Chapter 4, the ACT has a leasehold system of land tenure and rural leases have no default term. Lack of certainty around leases impacts business financing and planning, including investment in conservation initiatives and little to no incentive for rural leaseholders to conserve land in their control for biodiversity. At worst, this situation creates a perverse incentive for the land to be worked hard for the limited period available.

Chapter 4 also notes that there is no specific agricultural policy in place for the ACT. Rather, there is the *Canberra Region Local Food Strategy 2023–29*. Hence, there is no clearly articulated strategic long-term Government vision for Canberra's broadacre regions. Rural lands have been described as "a land bank for future urban areas as the city grows. This may mean parts of the broadacre zone are replaced over time with an urban zone, such as industrial, to meet the future employment needs of the city".[53] This may insidiously already be happening, as illustrated by the case study below. Viewing rural lands as "banks" patently impacts environmental management in the short and medium term.

The lack of strategic vision is further demonstrated in considering together draft versions of the ACT's draft Circular Economy Strategy, the Capital Food and Fibre Strategy and the Caring for Dhawura Ngunnawal: A Natural Resource Plan for the ACT 2022–25 (NRM Plan). These draft plans and strategies underwent public consultation in 2022–23. Inconsistencies between them reveal the lack of strategic alignment and policy concurrence across Government.

The draft Capital Food and Fibre Strategy and NRM Plan both identified limited land availability as a major barrier to meeting their objectives of growing and processing food and identify urban and peri-urban expansion as a major pressure. Both policies mentioned the need to secure land for long-term food and fibre production against potential

51 ACT Government, 2022. *Caring for Dhawura Ngunnawal: A natural resource plan for the ACT 2022-2042.*

52 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, Community Leadership in Environment, Sustainability and Climate. Available at: https://www.actsoe2023.com.au/issues/community-leadership/#Rural-landholders

53 ACT Government, ACT Planning and Land Authority, 2010. *Planning the Eastern Broadacre Area: A Discussion Paper.*

development. However, the draft Circular Economy Strategy noted the eastern broadacre corridor as a potential location for future industrial and employment uses, with Majura Valley identified as one of the 10 potential areas for future development. Hence, the outlined goals of the draft Circular Economy Strategy may have inadvertently hindered the outcomes of the Food and Fibre Strategy and NRM Plan.

In undertaking this Investigation, OCSE met with numerous rural leaseholders. A consistent point of discussion was around interactions with the ACT Government about consistent land management. Many rural lessees farm properties that border ACT Government land and described specific management issues. These issues can be paraphrased more simply – rural lessees are seeking a "good neighbour" in Government.

Rural leases have clear lease conditions and are bound by Land Management Agreements (LMAs). Currently the management of each rural lease area continues to fundamentally rely on its LMA. LMAs are not published, not permanent, can be altered by Government[54] and provide few incentives for lessees to undertake initiatives to improve their lease areas. The Conservator of Flora and Fauna is able to make guidelines setting out the requirements for LMAs,[55] but no current guidelines are in place. Some rural landholders perceive that these requirements for diligence in land management are not tenure blind. Lessees raised concerns around collaborative partnerships and communication, highlighting numerous cross-tenure issues around invasive species control and fire management activities. They suggested that the expectations on rural lessees are more exacting than the Government's own endeavours, leading to a perceived "double standard". The paramount desire articulated with these stakeholders was for better neighbourly relationships with Government, to be achieved through improved communication, collaboration and consistent management expectations.

Cattle on a rural ACT property. Source: OCSE

Significant reform is required to better manage leasehold land and the valuable biodiversity remaining on many rural leases. There are numerous pathways to reform and other jurisdictions have adopted varying approaches, including biodiversity stewardship agreements and conservation covenants. Literature indicates that some landholders support the concept of providing perpetual protection for areas of high conservation value within their control *if* suitable incentives are provided for lost productivity.[56] A statutory program should be enacted to enable the establishment of *permanent* and *secure* protected areas on rural leasehold land. Such mechanisms protect leasehold tenures in four of six Australian states.[57] Incentives are needed to encourage leaseholders considering executing protection instruments made under such a mechanism to protect rural leasehold sites with important remnants of critically endangered ecological communities and/or populations of threatened species.

54 Australian Conservation Foundation, 2024. *Appendices – Set and forget: how offsets under national environmental law drive habitat destruction*, p.27.

55 ACT Government, 2023. *Planning Act 2023 (ACT)*, s 350(4).

56 Brugler, S., 2023. *Evaluating successes and challenges for effective governance of privately protected areas in Australia.* Frontiers in Conservation Science, 4(1).

57 The exceptions are Tasmania and Victoria, where leasehold land cannot be protected with high-quality protection mechanisms. See Australian Conservation Foundation, 2024. *Appendices – Set and forget: how offsets under national environmental law drive habitat destruction*, p.4, 8–9, 19–20 and 22.

Case study
Majura Valley rural block

This case study provides an illustration of the way in which the environmental degradation can occur over time, even when prescribed regulatory guidelines are followed.

This example comes from a rural block in the Majura Valley, in Canberra's east. The block is zoned under the Territory Plan as Non-Urban Zone 1 Broadacre. This zoning aims to preserve the rural landscape, visual amenity and environmental quality of the land surrounding urban Canberra while permitting a range of complementary uses.[58]

Based on historic aerial images, this block appears to have been used as an agricultural or rural lifestyle block (Figure 8.2) until around 2013. The duplication of the Majura Parkway in 2014 significantly reduced the size of the block and since then images show it being used for storage of vehicles and equipment, with loss of vegetation across the site. The extent of this storage and conversion of the block from grass to hard standing or asphalt has increased over the years up to the most recent available satellite imagery from November 2023 (Figures 8.3–8.6).

Since 2014, the ACT Government has received numerous complaints from members of the public about unlawful activities at this block and the environmental degradation which has occurred as a result. Inspections of the block by ACT Government officers at different times over the years have reported the following:

- builders waste, timber pallets, scrap metal, building materials, derelict vehicles, several shipping containers and other items scattered across the block
- inappropriate or unlawful storage of chemicals, earthworks and water use
- scaffolding, bricks and sheet metal stored on the block
- several trucks and civil works vehicles; shipping containers; crates of concrete pavers and columns; stacks of steel beams and mesh; timber crates; hoist; skip bins; and other building material items
- a civil construction business

The approach taken by ACT Government in its attempts to address non-compliant activities on the block has been based on "education and consultation" in line with Access Canberra's *Regulatory Compliance and Enforcement Policy*,[59] which sets out the agency's regulatory approach:

> *Access Canberra encourages compliance through education and awareness but will apply escalating enforcement actions to those that demonstrate a disregard for the law and whose conduct has, or is likely, to cause harm to consumers, business, the community or the environment.*

In spite of ongoing ACT Government engagement regarding non-compliant activities over many years, it is not evident that "escalated enforcement" was ever applied. An approach to regulation based solely on "education and awareness" has been demonstrably unsuccessful in protecting the environment from harm in this case.

58 ACT Government, 2023. *Territory Plan 2023 Part E – Zone Policies*. Available at: https://www.legislation.act.gov.au/ni/2023-540/Current

59 ACT Government, Access Canberra, 2020. *Regulatory Compliance and Enforcement Policy*. Available at: www.accesscanberra.act.gov.au/__data/assets/pdf_file/0010/2303578/AC-Regulatory-Compliance-Enforcement-Policy.pdf

Figure 8.2. Block in 2012, before Majura Parkway duplication.
Source: Derived from ACTmapi

Figure 8.3. Block in 2015.
Source: Derived from ACTmapi

Figure 8.4. Block in July 2022.
Source: Derived from ACTmapi

Figure 8.5. Block in November 2023.
Source: Derived from ACTmapi

This case provides evidence that development in the ACT continues to occur in an unplanned manner, where land zoned exclusively for use as a rural enterprise can be used for other purposes with no penalty. This approach is not consistent with ecologically sustainable development. It sets a worrying precedent for land being used for non-compliant purposes with no penalty.

Even after being made aware of the issues described above, the ACT Government has now formally sanctioned the use of the block for non-rural purposes through granting a development application for a transport depot to be established at the site.

This example illustrates a failure of the ACT planning system to deliver ecologically sustainable development.

Nature parks, nature reserves and special purpose reserves

Canberra's reserved areas cover around 146,800 ha, accounting for over 60 per cent of the ACT's total area (higher than any other Australian jurisdiction). These include national parks, nature reserves, special purpose reserves, and water supply protection areas. As noted in detail in Chapter 4, it is very difficult to say whether the natural values of protected areas are currently managed effectively. There are several issues with management of protected areas, including:

1. *Primacy*. Perhaps most significantly, the *Nature Conservation Act 2014*60 does not have "primacy" in reserves, which is a crucial requirement for the long-term protection and preservation of reserved areas.
2. *Soundness of management*. Existing conservation reserves provide some protection, but targeted strategies are needed to minimise impacts on biodiversity and maintain and improve habitat functionality, including in reserves. Chapter 4 also notes that current knowledge gaps make it challenging to assess if conservation reserves are effectively protecting ecosystems and biodiversity.
3. *Permanence of protection*. As many ecosystems outside reserve areas in the ACT remain under considerable threat, protected areas are an essential instrument for nature conservation. Strengthened protections are required to ensure the future of these ecosystems in the ACT. Programs that support protection of areas in perpetuity (e.g. conservation covenants) should be considered for implementation.

Goorooyaroo Nature Reserve overlooking Gungahlin. Source: Richie Southerton

60 ACT Government, 2024. *Nature Conservation Act 2014 (ACT), Republication No 32.*

8.3.3 Seeing Canberra within the region

The growth of Canberra and associated environmental impacts must be considered in a broad geographical context.

Maintaining and restoring cross-border ecological connections and interactions is essential for managing Canberra's environment. The *Caring for Dhawura Ngunnawal: A Natural Resource Plan for the ACT* outlines Canberra's place within the environment of the region.[61] The ACT falls within the Upper Murrumbidgee river catchment, which is one of the largest tributaries of the extensive Murray Darling Basin river system. It is part of both the south-east highlands bioregion and the Australian alps bioregion. The plan notes that the ACT is part of nationally important wildlife corridors and migratory routes that link the mountainous corridors of the great divide and the coastal ranges of eastern Australia. The ACT Natural Resource Management region is bordered by two neighbouring NSW Natural Resource Management regions with their own regional bodies – South-East Local Land Services and Riverina Local Land Services – and by four NSW local government areas. Management of national parks, and conservation and biodiversity more broadly, requires inter-jurisdictional cooperation.

In terms of urban development, there has been increasing interest in the development of NSW rural areas located within commuting distance of Canberra.[62] These areas of interest are not necessarily close to existing urban areas, and the ACT Government has raised concerns about these proposals for urban development due to sustainability, infrastructure servicing and environmental considerations.

Such considerations and impacts are not limited to residential development, and include major projects subject to approval by the NSW Independent Planning Commission. For example, the proposed Wallaroo Solar Farm will be located approximately one kilometre south of the rural area of Wallaroo, adjacent to the NSW and ACT border. It falls within the Yass Valley Local Government Area. Canberra community members, organisations and government agencies provided submissions objecting to the development on the basis of environmental and amenity concerns, and its proximity to suburban Canberra. The NSW Independent Planning Commission determined that the project was in the public interest, and that the site was suitable for renewable energy development.

The growth of Canberra's footprint has placed converse pressure on the border. In recent years, the ACT and NSW Governments have been negotiating changes to the border to accommodate development within the ACT and allow expansion accordingly.[63] There is also considerable cross-border pressure on adjacent jurisdictions that results from requirements to secure and manage offset sites. As discussed in Chapter 4, environmental offsetting is a policy framework set up to compensate for biodiversity losses from development by maintaining or increasing environmental value *elsewhere*. Offsets should achieve biodiversity gains equal to or greater than what is lost in the development area, which is known as "no net loss" or "net gain". They should also incentivise developers to reduce environmental impacts due to the high cost of offsetting.

61 ACT Government, 2022. *Caring for Dhawura Ngunnawal: A natural resource plan for the ACT 2022–2042.*

62 ACT Government, n.d. *Compact and efficient city*, Direction 1.5 – Protect the ACT and NSW border interface. Available at: https://www.planning.act.gov.au/act-planning-strategy/strategic-directions/compact-and-efficient-city

63 Radford, A., 2022. *NSW–ACT border to change to place Ginninderry development in the Australian Capital Territory*. ABC News, published on 16 September 2022. Available at: https://www.abc.net.au/news/2022-09-16/border-to-change-to-allow-territory-expansion/101446700

Offset sites that have been approved in association with ACT development sites include more than 2,301 ha of land.[64] As offsets are a relatively recent approach, most offset sites in Canberra are found in Canberra's newer suburbs. The proportion of approvals granted under the EPBC Act requiring an offset has increased sharply since 2005.[65] Since 2009, the total offset area in the ACT has increased 100 fold.[66] Most offset sites located in the ACT are in, or will at the expiry of the approval to which they relate be added to, the Canberra Nature Park or the Molonglo River Nature Reserve.

While long-term protection of offsets should be the ultimate goal of this approach, this investigation found that seven offset sites totalling 763 ha were already designated protected areas, or managed as protected areas, before the requirements to manage these areas as offsets came into legal effect. The additionality to conservation outcomes offered by using offsets which already had protection is questionable. There are also 848 ha across 11 sites that have no protection beyond the time-limited offset conditions themselves; future inclusion of these areas in formal reserves once the offset approvals expire is essential to ensure genuine realisation of offset conservation gains.

For some developments occurring in the ACT, offset obligations have been satisfied in NSW. For example, Canberra Airport Pty Ltd was required to offset the loss of natural temperature grasslands when it proceeded with development approved under the EPBC Act in 2009.[67] The Offset Register on the EPBC Act public portal confirms a 47 ha offset site has been established at Lots 86, 95 and 166 on DP 754890 ("Parlour Grasslands", 35 km south of Braidwood; Jerrabatgulla Rd, Jerrabatgulla, NSW). In two cases, offset obligations arising from actions taken in the ACT have been satisfied by the retirement of credits under the biodiversity offsets scheme operating in NSW. These were following the approval of the:

- Mugga Quarry overburden expansion project (EPBC 2018/8151), which permitted the loss of 5.52 ha of Box Gum Woodland at Mugga Quarry. In June 2020, the approval holder Boral Resources retired 170 ecosystem credits from a BioBank site northwest of Crookwell NSW.[68]
- City to Commonwealth Park Light Rail 2A (EPBC 2019/8582), which permitted the loss of 4.76 ha of Golden Sun Moth habitat in Canberra. In June 2021, the approval holder Major Projects Canberra retired 82 like-for-like species credits from the Wandiyali Restoration Trust in Jerrabomberra NSW.[69]

It is unclear how future development will secure offset sites given the scarcity of land available in the ACT. Future sites may be obtained from the conversion of rural leases to offset sites or be obtained in NSW. Both possibilities present enormous problems for conservation outcomes. Offsets should, after all other opportunities to avoid and mitigate have been exhausted, compensate for development impacts permitted under federal and Territory environmental laws and policy. They compensate for development by creating, restoring or protecting biodiversity elsewhere. In the case of rural leases, environmental values are often already well managed under rural lease tenure and offsets therefore may not provide any additional benefit.

64 Office of the Commissioner for Sustainability and the Environment, 2023. *2023 ACT State of the Environment Report*, Canberra's Urban Boundary. Available at: https://www.actsoe2023.com.au/issues/canberras-urban-boundary/

65 Australian National Audit Office, 2020. *Auditor-General Report No.47 2019–20 – Referrals, Assessments and Approvals of Controlled Actions under the Environment Protection and Biodiversity Conservation Act 1999*, p. 65.

66 Office of the Commissioner for Sustainability and the Environment, 2021. *Environmental Offsets in the ACT*. Available at: https://envcomm.act.gov.au/latest-from-us/environmental-offsets-in-the-act/

67 Australian Government, Department of the Environment, Water, Heritage and the Arts, 2009. *Approval Notice for Infrastructure Upgrade and Construction at Canberra Airport ACT (APBC 2009/4748)*. Available at: https://epbcpublicportal.environment.gov.au/_entity/sharepointdocumentlocation/cc2a9176-44b3-ec11-983f-00224818ab04/2ab10dab-d681-4911-b881-cc99413f07b6?file=approval.pdf

68 Boral, 2023. *EPBC 2018/8151 Mugga Quarry Overburden Expansion Project*, p.9, 13. Available at: https://www.boral.com.au/sites/default/files/2024-07/Mugga_EPBC_Report_Year_3_2022-2023.pdf

69 Major Projects Canberra, 2024. *RE question about the offset required for City to Commonwealth Park Light Rail Project ACT (EPBC 20198582).* Email correspondence, 2 August 2024.

Challenges and opportunities: Icon Water's Williamsdale offset property

Williamsdale offset site. Source: OCSE

One example of an offset in the ACT for which there is evidence of conservation gains is Icon Water's 110 ha offset at Williamsdale. This offset was established following the construction of the Murrumbidgee to Googong raw water transfer pipeline from Angle Crossing in the ACT to Burra Creek in NSW, which necessitated the removal of native vegetation including Box-Gum Grassy Woodland. Icon Water also owns and manages a further 328 ha of land as part of a larger property around the offset, which straddles the ACT–NSW border. The entire area is managed as one unit as far as possible; this consistent approach improves conservation outcomes for the offset. Icon Water is required to manage the offset in accordance with Murrumbidgee to Googong Water Transfer Offset Delivery Plan, under the Murrumbidgee to Googong Operational Environmental Management Plan[70] which is approved by regulators in the ACT, NSW and at the Commonwealth level.

This is a particularly complex property to manage because some of it is an offset, and some of it is not; and part of the property is in NSW, and part in the ACT. This means there are different management requirements for different parts of the property, which presents its own set of challenges for the land manager. For example, grazing is not permitted within the offset area. Grazing by cattle has proved to be an effective approach for managing St John's Wort at the property, so perversely this stipulation means that there is more of this weed within the offset area than in other parts of the property where cattle grazing is used as a management tool. Similarly, approaches to kangaroo management across the two jurisdictions are quite distinct, requiring two different sets of approvals and different techniques to control kangaroos in NSW and the ACT.

While the Murrumbidgee to Googong Water Transfer Offset Delivery Plan, as with any offset management plan, provides a guide for management of the site, it is also relatively static. This can present its own challenges. For example, the management plan may require activities to be undertaken at a particular time with no recognition of the fact that they are highly weather-dependent. It also may not accommodate the fact that ecological conditions on the property vary considerably from year to year due to background climatic effects rather than management practices.

Icon Water has also had to make substantial investments in high electric fencing to protect plantings from feral animals such as deer, which destroyed many young trees before the fences were installed.

70 Icon Water, 2022. *Murrumbidgee to Googong Operational Environmental Management Plan*. Available at: www.iconwater.com.au/sites/default/files/2023-10/Murrumbidgee%20to%20Googong%20Operational%20Environmental%20Management%20Plan.pdf

As a water utility, conservation is not core business for Icon Water. Their organisational aim for the offset is to meet the minimum requirements set out in the Murrumbidgee to Googong Water Transfer Offset Delivery Plan. However, beyond this the company recognises that there are practical, financial and reputational benefits to managing the property to as high a standard as possible. This includes a desire to be a "good neighbour" to other land managers in order to foster collaborative working relationships to achieve common goals such as weed control. Because Icon Water is committed to managing the property in perpetuity, they have had the ability to trial different land management approaches over time, giving them the capacity to learn from mis-steps, respond to emerging research, and apply new techniques. This enables land managers to develop a deep knowledge of what works specifically at the site.

As a result of this approach, the amount of money spent on managing the offset to maintain it at the required condition is actually decreasing over time as land managers are able to capitalise on past learnings and work with nature to create a more stable ecosystem at the site. Investment in conservation at Williamsdale has proved to be a sound business decision, with the site now a valuable asset which can potentially be leveraged for further offsets in the future.

Icon Water's aspirations for the offset site are that its ecosystems will be in such good condition that they will largely be self-sustaining, with minimal need for management interventions. They would also like to do more work with academics and research institutions to use the Williamsdale property as a research site. There are also opportunities for collaborations such as the cool burns conducted at the property in May 2024 in partnership with the Upper Murrumbidgee Catchment Network and Buru Ngunawal Aboriginal Corporation. This event provided an opportunity for the community to learn from Ngunawal custodians about traditional land management practices used by people living in the area before European settlement.

8.4 Concluding remarks

This investigation has revealed the scale of environmental degradation that has occurred alongside Canberra's urban expansion and densification since 2004. There is a suite of evidence that Canberra's natural environment – much like the rest of Australia – is in a state of decline. Planning legislation, policy and approaches have not delivered a compact and efficient city and existing environmental protections have been deplorably insufficient in slowing, halting or reversing the deterioration of species and ecosystems. There is no clear strategy for consideration of the cumulative impacts of development on biodiversity and key habitats.

We are perilously close to the edge of nature's resilience as it is increasingly being pushed to a point where recovery is not possible.

Nonetheless, there remains tremendous opportunity for Canberra to improve outcomes for both its community and its natural environment. This chapter has highlighted examples of block, district and city-level approaches, strategies and initiatives that have delivered environmental outcomes, with many social and economic co-benefits. Indeed, the ACT Government has many commendable initiatives relating to ecosystem services and biodiversity conservation within Canberra's urban area. These include:

- Urban Forest Strategy
- Living Infrastructure Plan
- Support for Landcare and Parkcare volunteers as well as other community environment groups
- Canberra Nature Park system of urban reserves
- Adopt-a-Park program
- Education and information relating to biodiversity-friendly gardens
- Biodiversity Sensitive Urban Design Guide for developments above a certain threshold.

Mt Rogers towards Belconnen. Source: EPSDD

To reverse this trajectory of decline and obtain the identified benefits, significant reform is required. Chapter 2 offers a pathway to commence this trajectory, through a set of Recommendations to Government and key issues that require redressing. Current legislation, policy and approaches have not remedied the decline in our environment, due to combinations of their insufficiencies, inadequate resourcing or lack of Government commitment to long term strategy. Chapter 2 implores a commitment to this reform, prioritisation of nature in decision-making and the allocation of sufficient funding for biodiversity protection, conservation and restoration.

This report has focused on assessing the consequences of development on the natural environment of the ACT to date and proposing actions to protect the environment from future negative impacts. It has not explored nature restoration beyond brief discussion of offsets policies and the *Nature Repair Act 2023*.[71] Nature protection must precede other efforts to avoid future damage.

The scale of recovery that is needed is tremendous. Reversing Australia's trajectory of biodiversity decline will require a range of different efforts across all regions and sectors. Recent research estimated the cost to Australia of full recovery of threatened species. It determined that the annual cost to fully restore populations of 1,657 threatened terrestrial and freshwater species to be $583 billion.[72] Another found it would cost $15.6 billion per year for 30 years to prevent the extinction of 99 priority native species.[73] Rehabilitation, restoration and recovery of natural ecosystems is complementary to protective approaches and maintain ecosystem health. In 2022, Australia signed the Kunming–Montreal Global Biodiversity Framework.[74] This agreement is working to bring biodiversity loss almost to zero by 2030 and for native wild species to become more abundant and resilient by 2050. This will require protection and restoration to succeed.

71 Australian Government, 2024. *Nature Repair Act 2023, Compilation No 1.*

72 Reside, A., Carwardine, J., Ward, M. et al, 2024. *The cost of recovering Australia's threatened species*. Nature Ecology & Evolution, 2024(1).

73 Ward, M., Possingham, H., Wintle, B., et al, 2025. *The estimated cost of preventing extinction and progressing recovery for Australia's priority threatened species*. PNAS, 122(6).

74 United Nations Environment Program, Convention on Biological Diversity, 2022. *Kunming-Montreal Global Biodiversity Framework*.