COMMISSIONER FOR SUSTAINABILITY AND THE ENVIRONMENT

ARUP

INDEPENDENT AUDIT OF THE MOLONGLO VALLEY STRATEGIC ASSESSMENT

April 2018

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Acronyms

ACT	Australian Capital Territory
AMS	Adaptive Management Strategy
ANU	Australian National University
APZ	Asset Protection Zone
CEMPs	Construction Environmental Management Plans
EPSDD	Environment, Planning and Sustainable Development Directorate
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
MNES	Matters of National Environmental Significance
NC Act	Nature Conservation Act 2014 (Australian Capital Territory)
OCSE	Office of the Commissioner for Sustainability and the Environment
SLA	Suburban Land Agency
The NES Plan	Molonglo Valley Plan for the Protection of Matters of National Environmental Significance

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Commissioner's Foreword

In response to State of the Environment Reports (Commonwealth and Australian Capital Territory), it is very clear we must continue to take action to protect the environment, including threatened and endangered species and ecological communities. Climate change makes this responsibility all the more urgent.

"It is part of our responsibility [to be] looking after our country. If you don't look after country, country won't look after you."

—April Bright[1]

This *Independent Audit of the Molonglo Valley Strategic Assessment* is the first independent audit of the protection of Matters of National Environmental Significance under the Molonglo Valley Strategic Assessment.

Strategic assessments are long-term environmental protection initiatives which are designed to protect Matters of National Environmental Significance in keeping with the requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. They operate to streamline development processes by removing the need for site-by-site assessment of Matters of National Environmental Significance within the strategic assessment area. The opportunities and challenges associated with this approach to environmental protection are discussed in the body of this audit.

Governments are required to comply with commitments made in plans developed for strategic assessment requirements. In this audit the relevant plan is the *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011*.[2]

This audit process is required to be repeated at five yearly intervals over the 30 year timeframe of the Molonglo Valley Strategic Assessment.

The audit process is guided by the *Independent Audit and Audit Report Guidelines 2015* (Commonwealth)[3] and the audit specifications provided by the ACT Government. This audit does not include an examination of the financial underpinnings of the agreed commitments as the ACT Government advised that they will undertake this analysis separately, as part of the annual reporting process.

The ACT Government has committed to 61 commitments to address *Environment Protection and Biodiversity Conservation Act 1999* concerns about five Matters of National Environmental Significance across the areas subject to development pressures in the Molonglo Valley. These matters include the Pink-tailed Worm-lizard; White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland; Natural Temperate Grassland; the Superb Parrot; and the Swift Parrot.

In this audit we identify broad systemic risks and commitment specific risks to the ability to meet the commitments of the Molonglo Valley Strategic Assessment and the protection of the relevant Matters of National Environmental Significance.

1 Bright, A. http://indigiquotes.atsinj.com.au/index.php/indigenous-quotes/our-country/67-it-is-part-of-our-responsibility-to-be-looking-after-our-country, accessed 9 February 2018

2 NES Plan, https://www.environment.act.gov.au/__data/assets/pdf_file/0007/600964/NES_Plan.pdf, accessed 6 March 2018

3 Independent Audit and Audit Report Guidelines, http://www.environment.gov.au/epbc/publications/independent-audit-report-guidelines, accessed 6 March 2018

Broad systemic risks to the commitments to protect the Matters of National Environmental Significance in the Molonglo Valley include:

- ensuring there is appropriate resourcing and funding to effect implementation,
- documenting analysis of monitoring data to determine if the ecological condition of MNES has been maintained and enhanced,
- responding to the adaptation challenges of climate change,
- maintaining clear documentary evidence trails,
- finalising key documents in a timely fashion to support progress,
- urgently establishing the Kama Nature Reserve buffer, and
- ensuring that the Land Management Agreements on rural leaseholds are adjusted to protect Matters of National Environmental Significance.

The finalisation of the Kama Buffer is a key, broad risk which relates to several commitments (7, 27 and 34). The issues of concern are:

- there is currently a lack of definition of the width of the Kama Buffer zone, and
- there is a lack of clarity over responsibility for management and monitoring requirements of the buffer area.

The Kama Nature Reserve buffer remains in limbo pending the *Estate Development Plan* for Whitlam being finalised. The failure to deliver on the Kama Nature Reserve buffer commitment is observed as a risk to the ultimate delivery of the *Molonglo Valley Strategic Assessment*.

In respect of specific commitments under the *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011*, a number of risks have also emerged. These include:

- the development and finalisation of the *Molonglo River Park Reserve Management Plan*,
- the development of a management plan for Patches I, L, M and P, (see **Figure 2**) and
- the development of a management plan for other areas of Pink-tailed Worm-lizard high and moderate quality habitat.

Ongoing compliance with the *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011* will depend on several critical requirements being finalised. These are the:

1. Kama Nature Reserve buffer,
2. Molonglo Stage 3
   - Planning and Design Framework
   - Estate Development Plan, and
3. Molonglo River Reserve Management Plan (due in April 2014, draft released in February 2018 for public consultation).

A total of four Corrective Action Requests have been issued:

- CAR 1 – Provide the final draft Molonglo River Reserve Management Plan to the Minister by 31 July 2018.
- CAR 2 – Finalise the operational plan for Patch P to ensure appropriate management is occurring by 31 December 2018.
- CAR 3 – Incorporate actions and monitoring requirements into relevant Land Management Agreements for the protection of the ecological condition of Matters of National Environmental Significance within Patches I, L and M by 31 December 2018.
- CAR 4 – Finalise the operational plan for the Pink-tailed Worm-lizard Conservation Area in the Molonglo River Reserve by 30 April 2018.

I am pleased to acknowledge the contributions from Associate Professor Phillip Gibbons of the Fenner School of Environment and Society at the Australian National University and Adjunct Associate Professor Will Osborne of the Institute of Applied Ecology at the University of Canberra, both of whom assisted by providing scientific case studies about significant issues considered in this audit.

I also thank Dr Therese Flapper of Arup as the lead auditor.

We must not rest on our laurels in the important endeavour of protecting our ecological values. Retaining our biodiversity underpins our ability to sustain our bush capital characteristics and charm.

Professor Kate Auty
Commissioner for Sustainability and the Environment
Australian Capital Territory

Auditor's Certification

Auditor's name, position, company and contact details:

Dr Therese Flapper, Associate Principle, Infrastructure and Water, Arup

Auditor's qualifications and/or experience:

Lead Auditor in accordance with ISO 19011, ISO 9001, ISO14001 and ISO 22001.

Auditor's declaration:

I, Dr Therese Flapper

- For environmental audits that are required by a condition of an Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) approval I certify that, to the best of my knowledge, all information provided in the audit report attached to this audit certification statement is true, correct and complete.

I am aware that section 491 of the EPBC Act makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the regulations. The offence is punishable on conviction by imprisonment for not more than 1 year, a fine not more than 60 penalty units, or both.

Signature:

Date: 4 April 2018

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Introduction

Requirements for development in the Molonglo Valley are outlined in the *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011* (the NES Plan).[1]

The NES Plan:

- reflects the development activities proposed for the Molonglo Valley as set out in the Molonglo and North Weston Structure Plan (the Structure Plan), and
- establishes the Australian Capital Territory (ACT) Government's commitments to protect Matters of National Environmental Significance (MNES) within the strategic assessment area.

The NES Plan was endorsed on 7 October 2011 under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The actions associated with urban development in East Molonglo were approved on 20 December 2011.

The NES Plan commits the ACT Government to certain scheduling requirements. Commitments must either commence or be completed within a specified period of time after the strategic assessment endorsement date of 7 October 2011.

As a result of approval of the strategic assessment, the NES Plan has streamlined the development process by removing the need for site-by-site assessment of the MNES. Commitments in the NES Plan are required to be met as a function of approval by the Commonwealth.

The Molonglo Valley Strategic Assessment was developed in order to protect the MNES that occur in the area.

This independent audit ensures accountability and verifies that the ACT Government is delivering its commitments in the NES Plan to protect MNES.

The Molonglo River from Barrer Hill. Source Kate Auty

1 ACT Planning and Land Authority, 2011, *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011*, https://www.environment.act.gov.au/__data/assets/pdf_file/0007/600964/NES_Plan.pdf, accessed 22 February 2018

The Matters of National Environmental Significance in Molonglo

There are five MNES in the Molonglo Valley, each with unique and interesting characteristics.

1. PINK-TAILED WORM-LIZARD (*APRASIA PARAPULCHELLA*)

(LISTED AS VULNERABLE UNDER THE EPBC ACT)

Pink-tailed Worm-lizard. Source Richard Milner

- The Pink-tailed Worm-lizard is an unusual species and there is still much to learn about it.
- The lizard lives in the burrows of ant nests in soil beneath rocks, where it feeds on the eggs and larvae of ants within these nests.
- The lizard has a pink tail as a survival mechanism. Birds are attracted to their tail which they can then drop off to escape. If lost, the tail slowly regrows.[2]

2. WHITE BOX–YELLOW BOX–BLAKELY'S RED GUM GRASSY WOODLAND AND DERIVED NATIVE GRASSLAND (BOX–GUM WOODLAND)

(LISTED AS A CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY UNDER THE EPBC ACT)

Box–Gum Woodland in Kama Nature Reserve. Source Kirilly Dickson

- Prior to European settlement, Box–Gum Woodland covered several million hectares in the eastern part of the wheat-sheep belt and tablelands, including some coastal regions. Only 405,000 hectares are estimated to remain in Australia today.
- Box–Gum Woodland is *'one of the most poorly represented ecological communities in the national conservation reserve system. Due to the occurrence of the community on high fertility soils, much of it is on privately owned land, existing as isolated patches within an agricultural matrix of cropping, improved pastures and/or disturbed vegetation communities.'* [3] The ACT is an exception to this as most of the Box–Gum Woodland here is protected in public reserves. This has assisted in maintaining relatively large, high condition patches of the ecological community. As such, the areas of Box–Gum Woodland in the ACT are some of the best in the country.

The ACT contains the largest remaining remnants of Box–Gum Woodland in good condition. The size, connectivity, diversity and condition of the community in the ACT are said to be exceptional.[4]

2 Action Plan for the Pink-tailed Worm-lizard, http://www.legislation.act.gov.au/di/2017-67/current/pdf/2017-67.pdf, accessed 27 February 2018

3 White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland National Recovery Plan, http://www.environment.gov.au/biodiversity/threatened/recovery-plans/white-box-yellow-box-blakelys-red-gum-grassy-woodland-and-derived-native-grassland-national, accessed 4 January 2018

4 Ecological Australia Pty Ltd, 2011, *Molonglo and North Weston EPBC Act Strategic Assesment: Supplementary Report*, prepared for ACTPLA.

3. NATURAL TEMPERATE GRASSLAND OF THE SOUTHERN TABLELANDS OF NSW AND THE ACT (NATURAL TEMPERATE GRASSLAND)

(LISTED AS A CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY UNDER THE EPBC ACT)

Natural Temperate Grassland. Source Richard Milner

'Grasslands are distinctive in that they require active management. To not act is to fail.' [5]

'Australia appears set to embrace a new direction for grassland conservation – one where people are central to the story of their protection, restoration, management and use. This is logical and necessary, particularly given that the grasslands … sit largely within populated landscapes.' [6]

- Grasslands are often overlooked by the community as they appear as simply a paddock of grass. However, they are actually very significant areas that provide habitat and a source of food for several of our endangered species.
- Different threatened fauna species require different grass lengths for survival, for example the Striped Legless Lizard prefers a moderate extent of grass litter throughout the paddock, while Grassland Earless Dragons and Golden Sun Moth require more open grasslands.[7] Therefore, the grassland needs to be managed according to the species it is providing habitat for. See following diagram.
- Fauna is an integral component of Natural Temperate Grassland. Fauna is essential for pollination and dispersal of many grassland plants, nutrient cycling and maintenance of soil condition.

5 Natural Temperate Grassland of the Southern Tablelands (NSW and ACT), http://www.environment.gov.au/resource/natural-temperate-grassland-southern-tablelands-nsw-and-act, accessed 4 January 2018

6 Williams, N.S.G., Marshall, A. and Morgan, J.W. (eds) 2015, *Land of Sweeping Plains: managing and restoring the native grasslands of south-eastern Australia*, CSIRO Publishing, Melbourne, Australia, p.2

7 Ibid, p.3

DIFFERENT GRASS HEIGHTS REQUIRED FOR THREATENED SPECIES IN THE A.C.T.

2000-4000 kg/ha biomass

Tall dense grass with limited short grass and forbs

15cm

1000-2000 kg/ha biomass

Many medium height tussocks with inter-tussock spaces for short grass and forbs

STRIPED LEGLESS LIZARD

GRASSLAND EARLESS DRAGON

10cm

500-1000 kg/ha biomass

Few medium height tussocks with inter-tussock spaces including bare ground

GOLDEN SUN MOTH

5cm

150-500 kg/ha biomass

Short grass, with some bare ground

4. SUPERB PARROT (*POLYTELIS SWAINSONII*)

(LISTED AS VULNERABLE UNDER THE EPBC ACT)

Superb Parrot. Source Geoffrey Dabb

- Critical habitat features for Superb Parrots are clusters of large, mature living and dead trees for nesting sites. The highest threat to the Superb Parrot is the removal of this habitat.[8]
- Superb Parrots often return to nest in the same hollow in the same tree year after year, but the birds rotate between the hollows.

'Bioclimatic modelling has shown that the Superb Parrot is highly sensitive to climate change. Recent modelling … has shown the bioclimatic range of the Superb Parrot will decline by around 47 per cent by 2050 and 75 per cent by 2070. The future bioclimatic core range of the Superb Parrot will likely focus around the ACT and an area to the immediate north.' [9]

5. SWIFT PARROT (*LATHAMUS DISCOLOUR*)

(LISTED AS CRITICALLY ENDANGERED UNDER THE EPBC ACT)

Swift Parrot. Source Geoffrey Dabb

- The wild population of Swift Parrots is now likely to be considerably less than 2,000 birds.[10]
- The Swift Parrot migrates north to mainland Australia over winter from breeding areas in Tasmania. Sparse records in the ACT represent the sporadic nature of the distribution of the species on the mainland during winter months.[11]
- Birds disperse widely on the mainland to forage on flowers and psyllid lerps in eucalyptus trees. These eucalypts are a critical habitat feature for the bird.
- Ongoing habitat loss, particularly within the primary breeding areas in Tasmania, represents the single biggest threat to the survival of the Swift Parrot in the wild, particularly as this loss appears to enhance nest predation by introduced sugar gliders.[12]

8 Act Lowland Woodland Conservation Strategy, http://www.environment.act.gov.au/__data/assets/pdf_file/0007/576601/actionplan27t5.pdf, accessed 4 January 2018

9 Threatened Species Scientific Committee Conservation Advice for the Superb Parrot, http://www.environment.gov.au/biodiversity/threatened/species/pubs/738-conservation-advice-05052016.pdf, p. 3, accessed 4 January 2018

10 Threatened Species Scientific Committee Conservation Advice for the Swift Parrot http://www.environment.gov.au/biodiversity/threatened/species/pubs/744-conservation-advice-05052016.pdf, accessed 1 March 2018

11 Act Lowland Woodland Conservation Strategy, http://www.environment.act.gov.au/__data/assets/pdf_file/0007/576601/actionplan27t5.pdf, accessed 4 January 2018

12 Threatened Species Scientific Committee Conservation Advice for the Swift Parrot http://www.environment.gov.au/biodiversity/threatened/species/pubs/744-conservation-advice-05052016.pdf, accessed 1 March 2018

Reporting Requirements for the Molonglo Valley Strategic Assessment

The Molonglo Valley Strategic Assessment agreement, the NES Plan, operates for 30 years, until 2041.

Reporting requirements during this time are outlined in the NES Plan.

There are two main elements to the reporting framework:

1. a public annual report on implementation of the NES Plan, which is intended to highlight the conservation outcomes achieved in the previous year, and
2. an audit undertaken by an independent, third party expert every five years, across the 30 year period. A customised audit protocol is required to ensure that:
   - commitments made by the ACT Government in the NES Plan are being adhered to, and
   - conservation outcomes for the MNES are being achieved.

On 17 July 2017, the Commissioner for Sustainability and the Environment received a direction from the Minister for Climate Change and Sustainability, Shane Rattenbury MLA, to undertake this independent audit.

This Ministerial Direction was made pursuant to sections 12(1)(b) and 21(1)(a) of the *Commissioner for Sustainability and the Environment Act 1993*.

The Commissioner will provide the report to the Environment, Planning and Sustainable Development Directorate (EPSDD), which will then provide it to the Commonwealth Department of Environment and Energy.

The independent audit considered the compliance of the 44 actions outlined in the NES Plan. These are termed *Commitments* in the Audit Table.

The audit also considered the compliance of 16 additional actions as reported in the *Molonglo Valley Strategic Assessment Annual Report 2016–17*.[13] These are termed *Items* in the Audit Table.

The Commissioner is specifically required not to audit the commitment in relation to the Treasury Directorate ensuring funding for the commitments (Item 17 of the *Molonglo Valley Strategic Assessment Annual Report 2016–17*). ACT Government has advised the Commissioner that this will be undertaken separately as part of the annual reporting process.

The total number of commitments audited in this independent audit was 60.

This audit of commitments is a compliance audit delivered in accordance with the Commonwealth *Independent Audit and Audit Report Guidelines*.[14]

This audit does not scrutinise or evaluate the deliberations which produced the Molonglo Valley Strategic Assessment and the NES Plan.

13 *Molonglo Valley Strategic Assessment Annual Report 2016-17*, https://www.planning.act.gov.au/__data/assets/pdf_file/0011/1138952/Annual-Report-for-Molonglo-Valley-MNES-Plan-2016-2017-A14377130.pdf, accessed 1 March 2018

14 http://www.environment.gov.au/epbc/publications/independent-audit-report-guidelines accessed 2 March 2018

2 Overview of Strategic Assessments in Australia

A strategic assessment takes place early in the planning process for major projects or developments that trigger the EPBC Act. Strategic assessments examine the potential impacts of actions which might stem from one or more policy, program or plan on environmental systems and MNES. Strategic assessments involve individuals or agencies such as local councils, state ministers or government departments which are responsible for implementing the policy, plan or program.[1]

Productivity Commission's Report on Strategic Assessments

'Major projects are, by their very nature, complex developments.'[2]

The Australian Government Productivity Commission released a research report in November 2013 on *Major Project Development Assessment Processes*.[3] The report recommended Australia make greater use of strategic assessments:

> *'Strategic Planning and Assessment can take into account the cumulative impacts that arise from multiple projects and other activities on landscape-scale ecosystems. In turn, this can result in subsequent project assessment and approval processes being less resource intensive and time consuming, since some of the issues have already been handled.'*[4]

Although introduced in 1999, strategic assessments have only recently become frequently used. It is important to build on lessons learnt to ensure benefits are derived and the process improves.

The Productivity Commission report recommended changes to major development approval conditions to improve outcomes. These changes included:

- *publishing all conditions that are attached to approved major projects, with an explanation of how they mitigate a risk,*
- *refraining from imposing conditions where legislation already exists to achieve an outcome,*
- *undertaking public consultation on the assessment agency's draft recommendation, including proposed approval conditions, and*
- *providing scope to remove, alter or add conditions when a strong case to do so exists — for example, if evidence shows that conditions are no longer meeting objectives, or that compliance with a condition would have unintended adverse consequences.*[5]

This final recommendation is especially relevant to strategic assessments. If adopted, it would result in the appropriate elevation of adaptive management in these processes.

1 Commonwealth Department of the Environment, 2013, *Strategic Assessments under the EPBC Act*, http://www.environment.gov.au/system/files/resources/2b2afb82-db84-4f89-8bb1-5a899dc80ddb/files/strategic-assessment_1.pdf, accessed 10 November 2017

2 Ibid, page 9

3 Australia Government Productivity Commission, 2013, *Major Project Development Assessment Processes*, https://www.pc.gov.au/inquiries/completed/major-projects/report/major-projects.pdf, accessed 2 November 2017

4 Ibid, page 12

5 Ibid, page 26

Opportunities and Challenges of Strategic Assessments

In 2009, Dr Allan Hawke undertook an independent review of 10 years of the EPBC Act. This review received a large number of submissions during public consultation. One of the key topics scrutinised was the emerging strategic assessment instruments.[6]

Submitters suggested numerous mechanisms by which the quality of strategic assessments could be improved. Three themes that arose in these submissions were that strategic assessments should be:

- rigorous, of high quality and deliver environmental outcomes,
- sufficiently flexible and capable of adaptive management, and
- efficient, provide certainty and benefit proponents by reducing regulatory burden.[7]

One of the advantages of using a strategic assessment approach is that it enables long-term monitoring of the environment.

Long-term monitoring:

- provides essential evidence upon which to base good environmental decisions,
- needs to adapt to remain effective, and
- ensures monitoring is maintained and used to inform actions, and demonstrate that partnerships are crucial.[8]

Strategic assessments of developments are recognised as providing clear benefits (opportunities) over alternative approaches using smaller release areas. Implementation of conservation actions for MNES is coordinated across the entire area.

Strategic assessments also have challenges. They cover broad areas which makes them more complicated and any challenges are amplified as a result.

The specific wording in the original agreement of the strategic assessment is also critical, as it is not intended that commitments be altered. This makes adaptive management challenging.

These opportunities and challenges are represented in the infographic *Opportunities and Challenges of strategic assessments* which follows.

Barrer Hill Restoration Plantings. Source Kirilly Dickson

6 Hawke, Allan, 2009, http://www.environment.gov.au/resource/independent-review-environment-protection-and-biodiversity-conservation-act-1999-interim

7 Ibid

8 Lindenmayer, D., 2017, *Five things about long-term monitoring: good decisions for the environment need an eye on the longer term,* Decision Point, July 2017

OPPORTUNITIES & CHALLENGES OF STRATEGIC ASSESSMENTS

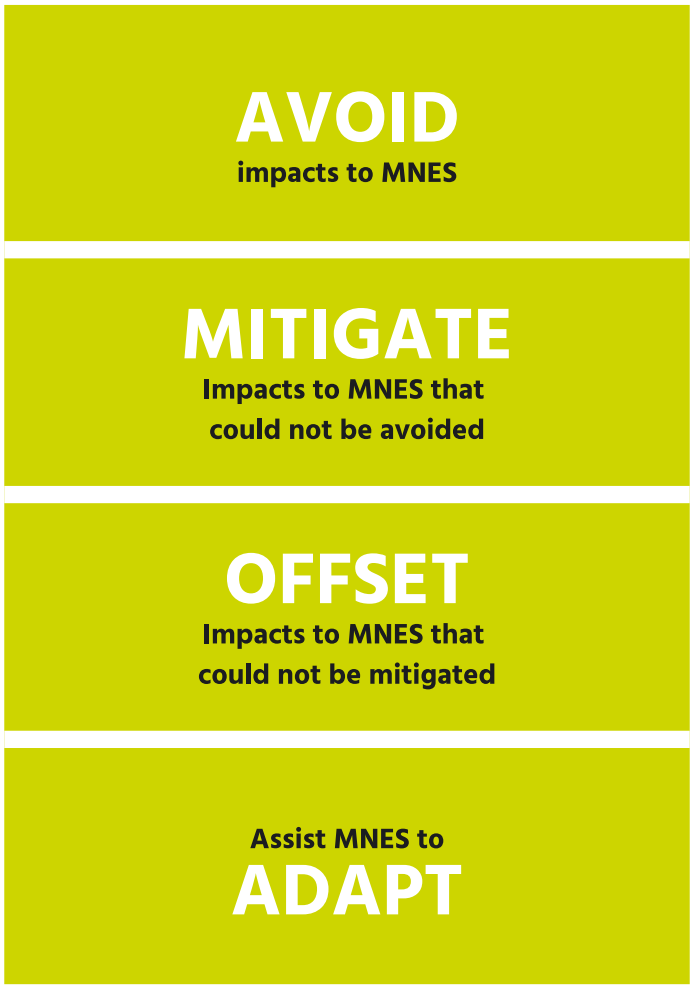
OPPORTUNITIES

1. LONGER, TEMPORAL AND LARGER LANDSCAPE SCALE CONSERVATION OUTCOMES
2. ASSESSMENT OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE EARLY IN PLANNING PROCESS
3. CUMULATIVE IMPACTS OF DEVELOPMENT ARE CONSIDERED COHESIVELY
4. STREAMLINES DEVELOPMENT APPLICATION PROCESSES
5. ENSURES COORDINATED IMPLEMENTATION OF ACTIONS ON OFFSET SITES

CHALLENGES

1. NO ALTERATIONS OF AGREED COMMITMENTS ONCE ENDORSED BY COMMONWEALTH
2. LACK OF COMPLIANCE AND ENFORCEMENT OF STRATEGIC ASSESSMENTS IN COMMONWEALTH LEGISLATION
3. HIGH STAFF TURNOVER IN ACT OR COMMONWEALTH GOVERNMENT AFFECTS COORDINATION AND IMPLEMENTATION OF THIS LONG-TERM PROJECT
4. BUDGET CYCLES ARE SHORT-TERM AND ESTABLISHMENT COSTS ARE HIGHER THAN ONGOING COSTS WHICH IS NOT SUITED TO LONG-TERM LAND MANAGEMENT

Key steps for achieving positive outcomes for MNES in potential development areas are understood to be:



Strategic assessments follow this process in an integrated and strategic way.

23 strategic assessments have been developed across Australia.

Only 12 strategic assessments have been officially endorsed and commenced. Three of these 12 are in the ACT – the Molonglo Valley Strategic Assessment, the Gungahlin Strategic Assessment and the West Belconnen Strategic Assessment.[9]

The Molonglo Valley Strategic Assessment was one of the first three strategic assessments to commence in Australia.

Accordingly, the entire process including the independent audits of compliance are in their infancy.[10] Governments and agencies could benefit from reviewing lessons learnt from independent compliance audits in early cases.

This audit is understood to be amongst the first independent audits of a strategic assessment in Australia.[11] The results of the Molonglo Valley Strategic Assessment audit provide an opportunity to reflect on how well the strategic assessment approach is working on a broader scale.

9 Australian Government Department of Environment and Energy (DoEE), http://www.environment.gov.au/protection/assessments/strategic, accessed 23 February 2018

10 WWF, 2009, *Response to the Australian Government's Discussion Paper seeking views to inform the Independent Review of the EPBC Act*, http://www.environment.gov.au/system/files/pages/dacbabf4-0bca-46ee-9271-2fa95ce1b6dc/files/181-world-wildlife-fund-australia.pdf, accessed 8 November 2017

11 Pers comms, staff from Monitoring and Assurance in the DoEE, 15 February 2017

3

Background to the Molonglo Valley Strategic Assessment

Early in 2008 the ACT recognised that the proposed development in the Molonglo Valley would be complex and involve multiple stakeholders. As such, it was considered that a strategic assessment under Part 10 of the EPBC Act would be preferable to assessing projects on a case by case basis.

On 16 September 2008, the ACT and Commonwealth Governments entered into an agreement to conduct a strategic assessment.[1] See **Figure 1** for the regional location of the strategic assessment area.

See **Figure 2** for the area included in the Molonglo Valley Strategic Assessment.

Button Wrinklewort plantings. Source Richard Milner

1 ACT Planning and Land Authority, 2011, *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011*, https://www.environment.act.gov.au/__data/assets/pdf_file/0007/600964/NES_Plan.pdf, accessed 22 February 2018

FIGURE 1: REGIONAL LOCATION OF THE MOLONGLO VALLEY STRATEGIC ASSESSMENT AREA

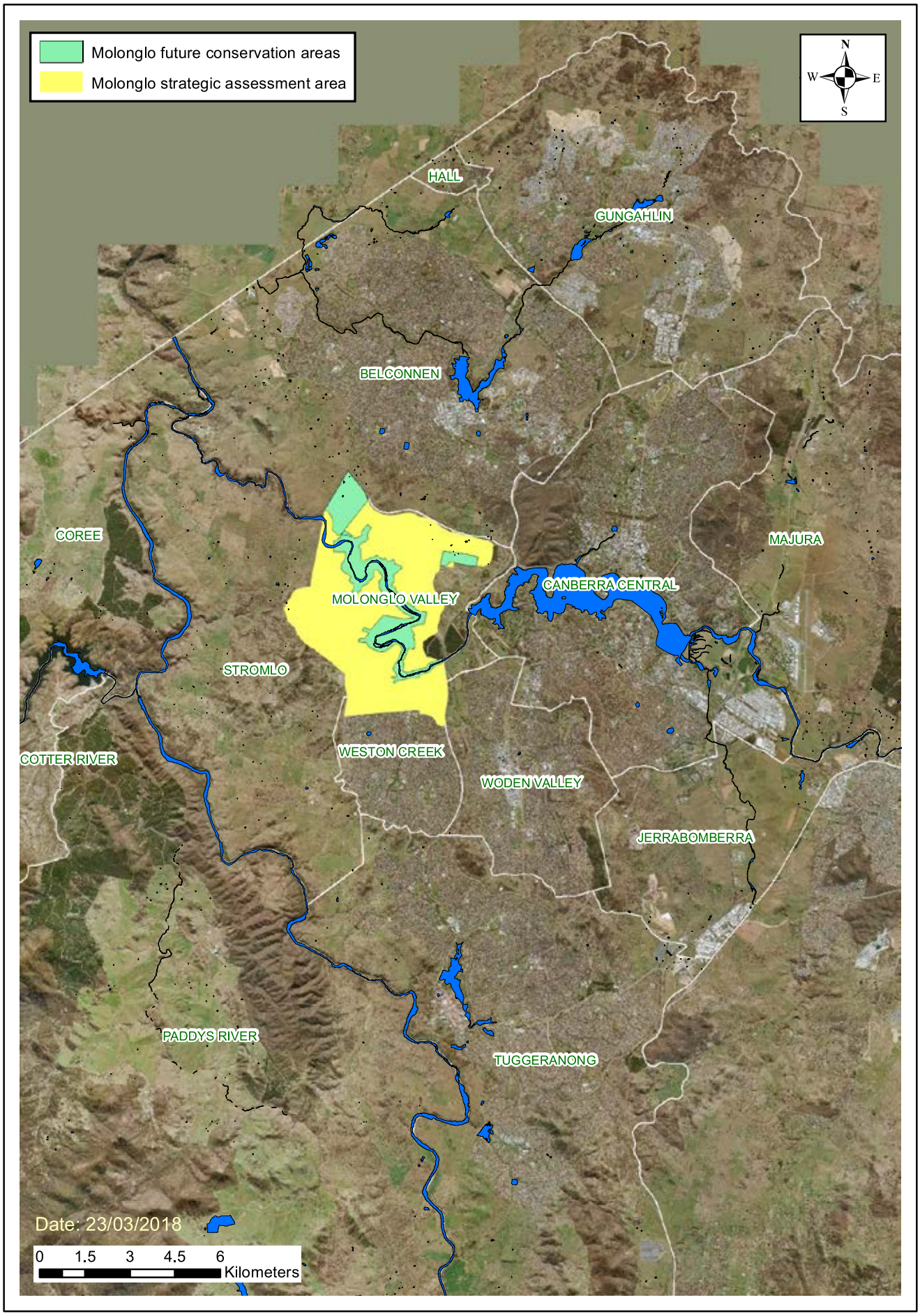
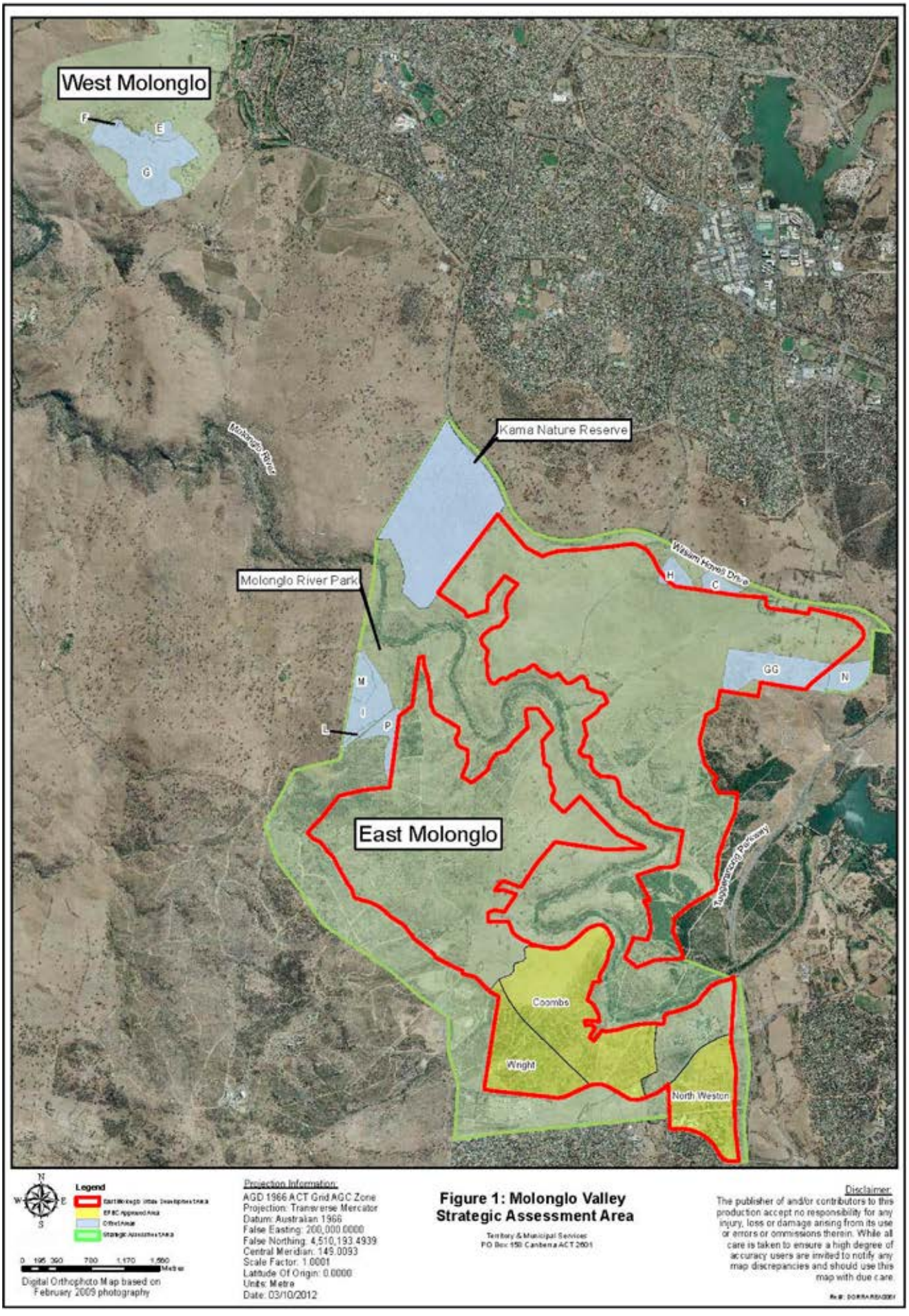


FIGURE 2: THE MOLONGLO VALLEY STRATEGIC ASSESSMENT AREA



The strategic assessment includes all of East Molonglo, with the exception of the suburbs of North Weston, Wright and a portion of Coombs (see **Figure 2**). These three suburbs gained prior approval from the Commonwealth under the EPBC Act (Reference numbers: 2009/5041, 2009/4752 and 2009/5050) and are therefore not included in the analysis or outcomes of the strategic assessment process.[2]

KEY LEGISLATION

In addition to the EPBC Act, there are four key pieces of legislation pertinent to the planning and management of conservation matters in the Territory:

- The Commonwealth *Australian Capital Territory (ACT) (Planning and Land Management) Act 1988,* which establishes the National Capital Plan to ensure that Canberra and the Territory are planned and developed in accordance with their national significance.
- The ACT *Planning and Development Act 2007* which seeks to provide a planning and land system that contributes to orderly and sustainable development of the ACT.
- The ACT *Nature Conservation Act 2014* (NC Act) which establishes a framework for the conservation and protection of biodiversity through the listing of threatened species and communities, and the establishment of Action Plans and management of reserved areas, among other administrative functions.
- The ACT *Pest Plants and Animals Act 2005* which aims to protect the ACT's land and aquatic resources from threats of pest plants and animals by means of strategic and sustainable pest management.

The NES Plan

The Molonglo Valley Strategic Assessment comprises three key documents:

1. The draft Strategic Assessment Report (March 2010) which was publicly exhibited and provided a detailed assessment of the implications of the draft NES Plan.
2. The Supplementary Assessment Report (17 July 2011) which addresses the issues raised in the public exhibition process and analyses the outcomes of the final NES Plan.
3. The final NES Plan was endorsed on 7 October 2011. This document identifies the commitments and undertakings of the ACT Government for the protection and management of MNES protected under the EPBC Act.

The NES Plan reflects the agreement for the strategic assessment in the Molonglo Valley between the ACT and Commonwealth Governments. It provides for urban development within the Molonglo Valley and establishes the ACT Government's commitments to protect MNES. The conservation measures to protect MNES are formed around two processes:

1. avoidance and mitigation of impacts on MNES, and
2. on-ground management and offsetting, to provide maintenance and improvement of MNES values in important areas.

A summary of these processes is provided in the NES Plan and a map of the agreed direct offset areas can be found at **Figure 3**.[3] Three offset areas have been agreed to under the Molonglo Valley Strategic Assessment – Kama Nature Reserve, the Molonglo River Park and Patch GG. The total of these areas is just under 700 hectares.

East Molonglo is expected to support a population of 55,000–60,000 within a 30 year planning horizon. The total area of the development is 1356 hectares which is divided by the Molonglo River into two distinct sections.

The Molonglo River corridor between the northern and southern areas will be important for both conservation and recreation.

The planning and development in East Molonglo is anticipated to occur in three stages (see **Figure 4**).[4] Stage 1 and 2 are under construction, Stage 3 has not yet commenced construction.

2 ACT Planning and Land Authority, 2011, *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011*, https://www.environment.act.gov.au/__data/assets/pdf_file/0007/600964/NES_Plan.pdf, accessed 22 February 2018

3 ACT Planning and Land Authority, 2011, *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011*, https://www.environment.act.gov.au/__data/assets/pdf_file/0007/600964/NES_Plan.pdf, accessed 22 February 2018

4 Ibid

FIGURE 3: AGREED DIRECT OFFSET AREAS

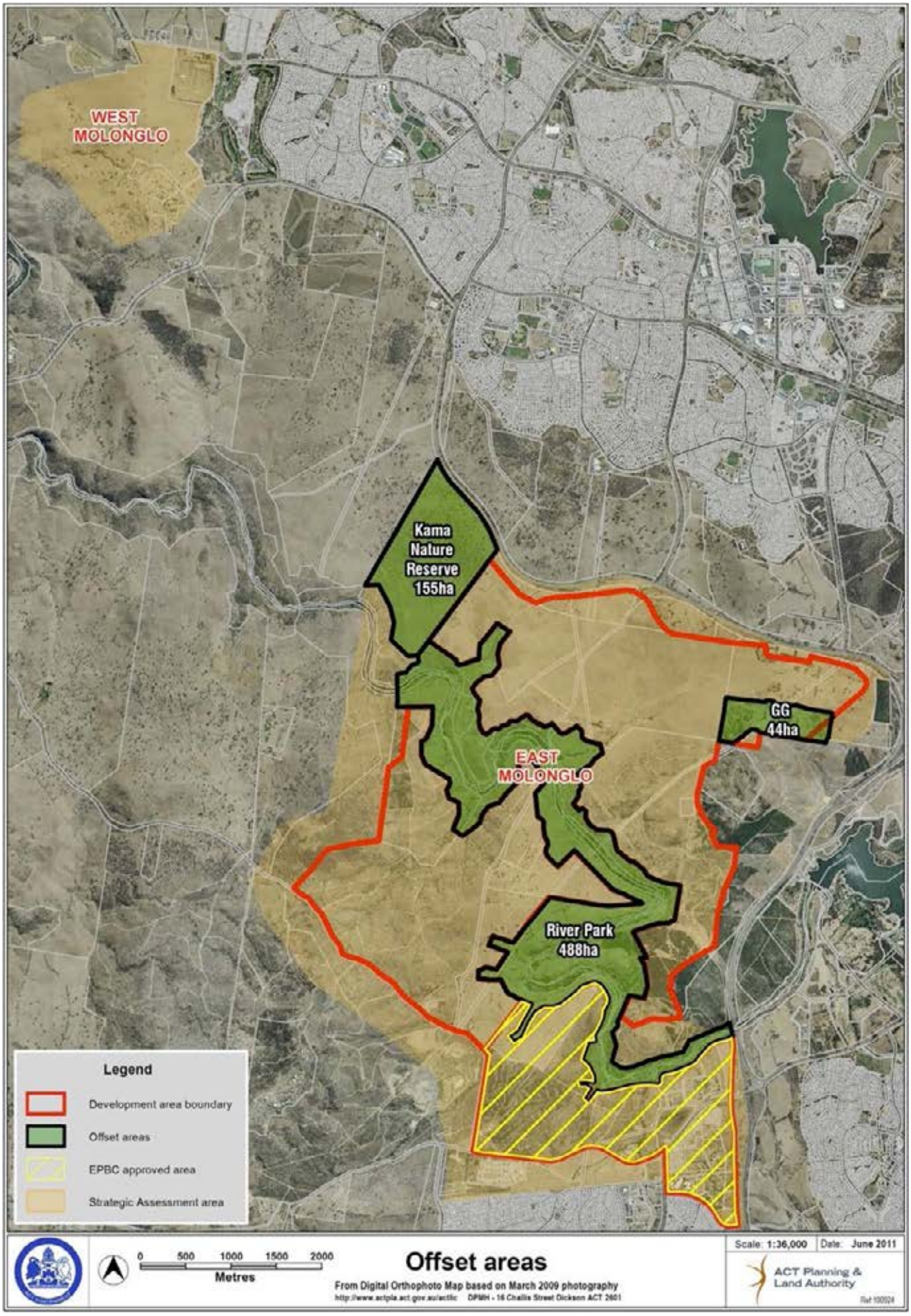
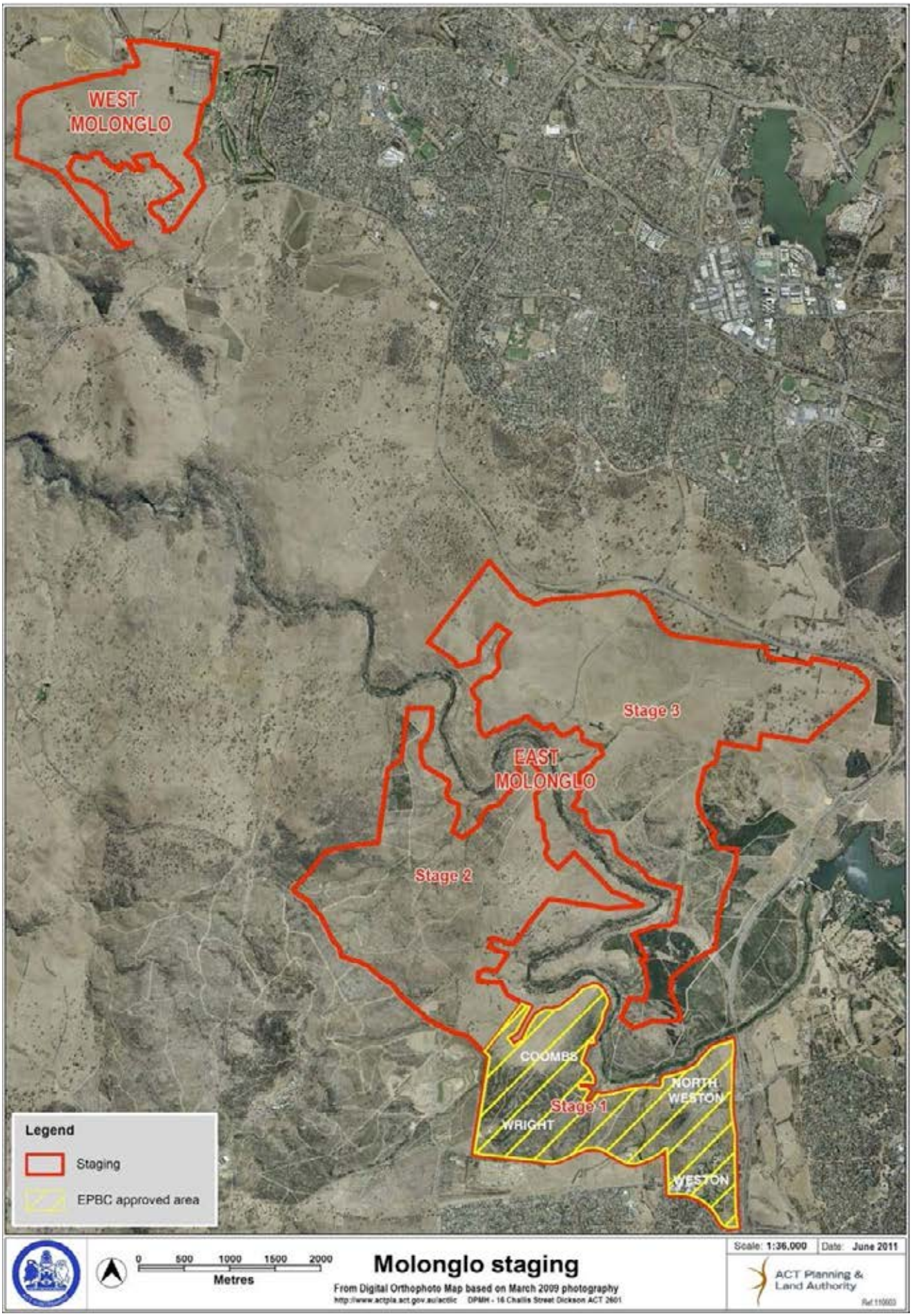


FIGURE 4: STAGES OF DEVELOPMENT FOR THE MOLONGLO VALLEY STRATEGIC ASSESSMENT



The Commitments for Protection of MNES

As discussed, there are five MNES protected under the strategic assessment agreement for the Molonglo Valley. There are specific commitments attributed to Box–Gum Woodland, Natural Temperate Grassland and the Pink-tailed Worm-lizard.

Due to the clear link between Box–Gum Woodland areas containing over-storey and habitat values for the Superb and Swift Parrots, the conservation outcomes and actions for the ecological community are intended to provide positive outcomes for these bird species. As such, there are no specific commitments for the Superb and Swift Parrots. The most important of these conservation outcomes is the protection and ongoing management of Kama Nature Reserve which includes approximately 117 hectares of Box–Gum Woodland.[5] The intention of protection of the two parrots being achieved in the commitments regarding Box–Gum Woodland will be tested through monitoring.[6]

Box–Gum Woodland and passing hawk at Kama Nature Reserve, February 2018. Source Kirilly Dickson

The Adaptive Management Strategy

The *Molonglo Adaptive Management Strategy* (AMS) is a key commitment arising out of the NES Plan. It forms the foundation on which the MNES values in the Molonglo area are to be protected and enhanced through ongoing improvement in management practices.[7]

The AMS adopts a set of measures that are designed to achieve the conservation outcomes and performance targets for MNES in the Molonglo Valley Strategic Assessment area. It sets out how the MNES of the area will be assessed, monitored and adaptively managed.

The AMS deals with the human-induced pressures of urban development, as well as natural uncertainties such as climate change.

It provides a plan for:

- establishing the current ecological condition and value of MNES within the Molonglo Valley Strategic Assessment area,
- identifying performance targets and objectives,
- monitoring and evaluation of management actions,
- revising actions as required, and
- ensuring that the NES Plan's objectives for MNES continue to be met.[8]

Figures 5 and **6** provide an overview of the areas of Box–Gum Woodland, Natural Temperate Grassland and Pink-tailed Worm-lizard habitat within the strategic assessment area.

Note that potential Superb and Swift Parrot habitat is predominantly associated with the areas of Box–Gum Woodland, and therefore is not mapped separately.

5 ACT Planning and Land Authority, 2011, *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance: NES Plan September 2011*, https://www.environment.act.gov.au/__data/assets/pdf_file/0007/600964/NES_Plan.pdf, accessed 22 February 2018

6 ACT Territory and Municipal Services, 2013, *Molonglo Adaptive Management Strategy*, http://www.tams.act.gov.au/__data/assets/pdf_file/0003/588045/Molonglo-Adaptive-Management-Strategy.pdf, access 23 February 2018

7 ACT Territory and Municipal Services, 2013, *Molonglo Adaptive Management Strategy*, http://www.tams.act.gov.au/__data/assets/pdf_file/0003/588045/Molonglo-Adaptive-Management-Strategy.pdf, access 23 February 2018

8 Ibid

FIGURE 5: BOX–GUM WOODLAND AND NATURAL TEMPERATE GRASSLAND

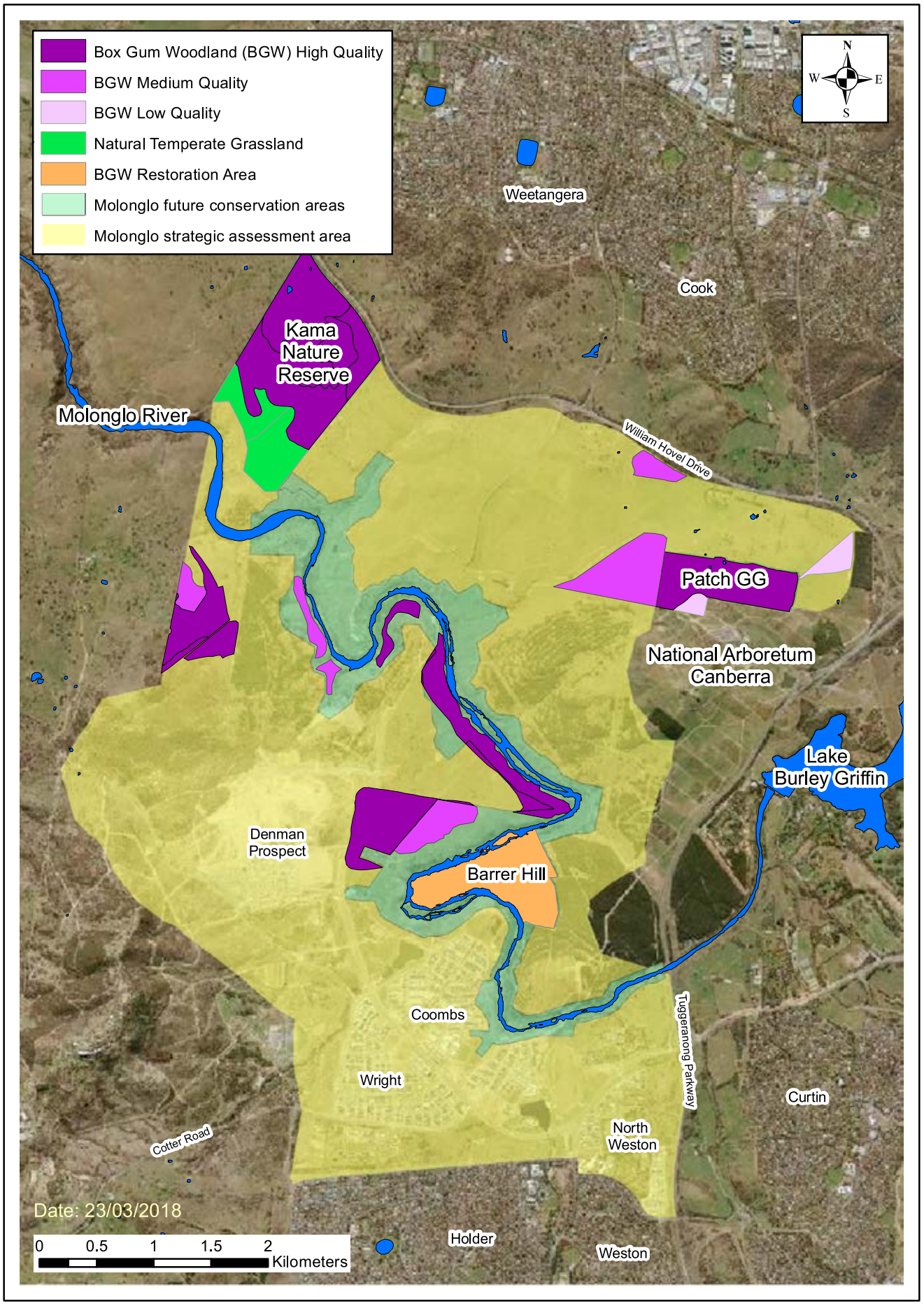
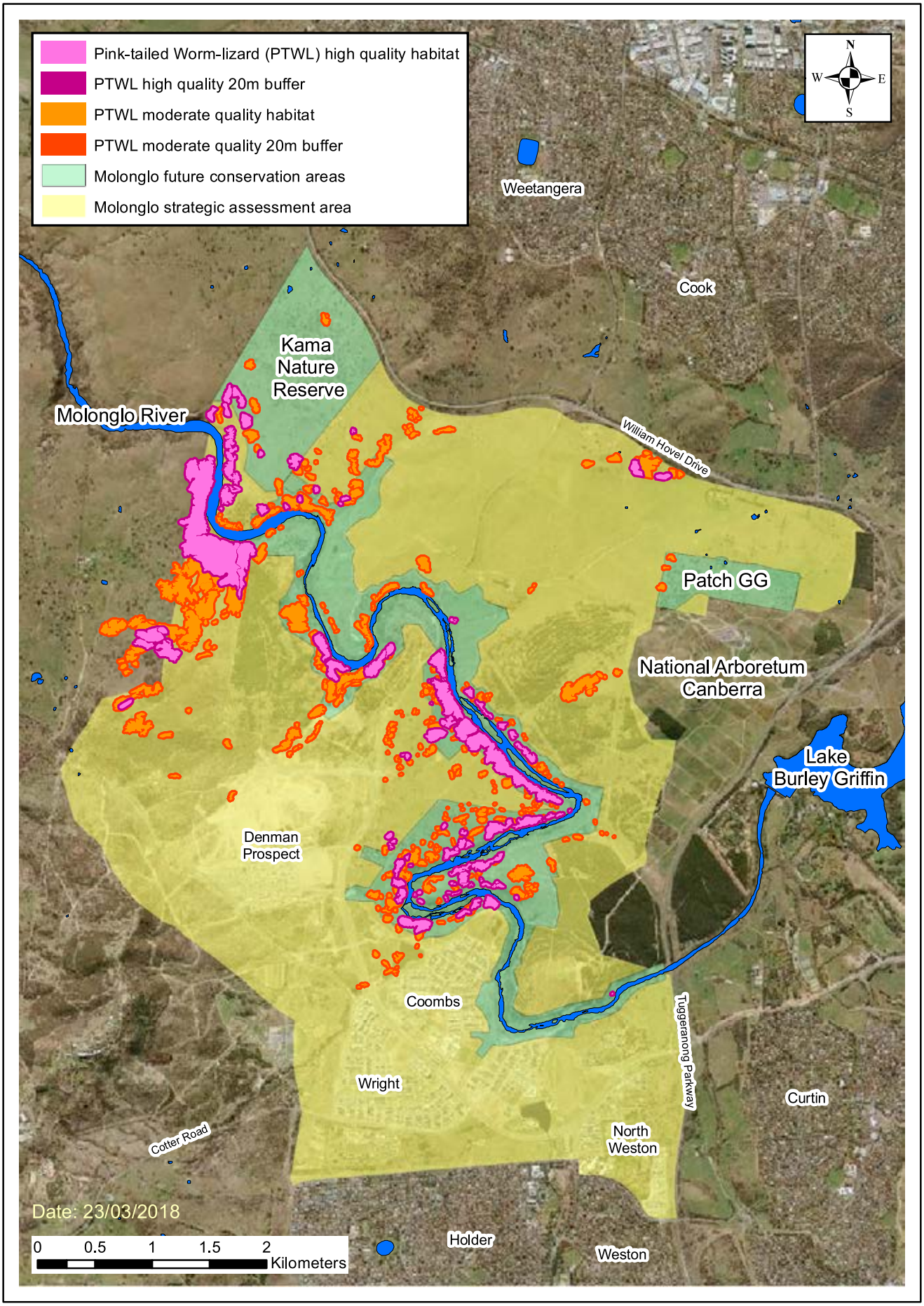


FIGURE 6: PINK-TAILED WORM-LIZARD HABITAT



Key Threats

The AMS outlines the key threats to the achievement of conservation outcomes and performance targets for MNES:

- weeds,
- pests,
- fire and fuel suppression,
- impacts from recreation,
- soil and water contamination,
- soil erosion,
- tree planting in Natural Temperate Grassland and tree planting or revegetation projects in the Pink-tailed Worm-lizard habitat, and
- increased resource competition from both native and exotic species.[9]

The adaptive management of these issues is addressed through the setting of objectives for each threat and through the monitoring of MNES to ascertain where any changes to management may be required. Ongoing monitoring of MNES is a key component of the AMS. Monitoring provides the opportunity to understand whether performance targets and management objectives are being achieved, and to determine if changes to ongoing management are required.

The planning framework for the AMS is outlined in **Figure 7**.

In terms of adaptive management, the operational plans are of most significance. These plans have no statutory prescriptions and so are best placed to respond to the evaluation results and recommendations arising from the monitoring program.

In order to evaluate and review the AMS, an expert panel of scientists and land managers with established expertise in Box–Gum Woodland, Natural Temperate Grassland, Pink-tailed Worm-lizard, and Superb and Swift Parrot ecology will be created. At a minimum, this panel will convene every five years and provide a report containing advice and recommendations for any amendments necessary to ensure the operational plans are achieving the conservation outcomes and performance targets for the MNES.[10]

Uncertainties

Key uncertainties for the management of MNES in the Molonglo Valley Strategic Assessment area:

- the best methods for restoration and rehabilitation of Box–Gum Woodland,
- how to monitor populations of the Pink-tailed Worm-lizard in a low impact way, and
- the best methods for restoration of Pink-tailed Worm-lizard habitat.

Targeted studies will be undertaken to address each of these issues and results will be incorporated into ongoing management.

Edge effects in the Molonglo Valley are an important issue to consider as there is an expansive area where the river reserve will be directly adjacent to the suburbs on both sides. Generally:

- the longer the edge – the larger the disturbance,
- the more angular the edges – the larger the disturbance,
- the smaller the reserve – the larger the disturbance, and
- the longer the reserve – the larger the disturbance.[11]

For an expanded commentary on these issues, refer to the expert commentary box, *Edging into Natural Areas.*

9 ACT Territory and Municipal Services, 2013, *Molonglo Adaptive Management Strategy*, http://www.tams.act.gov.au/__data/assets/pdf_file/0003/588045/Molonglo-Adaptive-Management-Strategy.pdf, accessed 28 February 2018

10 ACT Territory and Municipal Services, 2013, *Molonglo Adaptive Management Strategy*, http://www.tams.act.gov.au/__data/assets/pdf_file/0003/588045/Molonglo-Adaptive-Management-Strategy.pdf, accessed 28 February 2018

11 https://www.globallandrepair.com.au/wp-content/uploads/2011/02/The-Edge-Effect.pdf, accessed 4 January 2018

The Provision of Urban Open Space

The *Molonglo River Park Concept Plan Report*[12] provides a summary of the background investigations, key issues and design strategies that form the fundamental structure of the concept plan. This document aims to outline an approach to protect the MNES and enhance their habitat, protect the new residents from fire, as well as catering for their recreation and social needs.

> *'Surrounding the sensitive habitats of the Molonglo River Park, the new community will be settled at a density of about 3300 people per square kilometre on average lot sizes of 350 square metres. This compares to the current average in Canberra of 1450 people per square kilometre and 650 square metres respectively. The provision of neighbourhood and urban open space (i.e. open space within the residential development area) will be less than one third of the Canberra average at 2.4 hectares/1000 people versus 8.6 hectares/1000 people for the Canberra average. As a result, a significant component of the new residents' recreation and social needs must be met within the less environmentally sensitive areas of the future park.'* [13]

It is important to be cognisant of the pressure that will be placed on the Molonglo River Park with the increasing population of the Molonglo Valley as new suburbs are completed over the next 25 years.

Indirect Offsets

Two major restoration projects are outlined in the NES Plan to meet the indirect offset requirements of the Molonglo Valley Strategic Assessment.

Indirect Offset 1

BOX–GUM WOODLAND OFF–SITE RESTORATION PROJECT

(Commitment 23)

The indirect offset project for Box–Gum Woodland is designed to provide long term conservation outcomes. It addresses one of the key challenges in relation to woodland restoration and rehabilitation, that of limited information. It also addresses the need for the highest level of certainty possible in relation to the design of indirect offset projects.

The ACT Government will deliver an off-site restoration project in collaboration with local partners with expertise in the field of land restoration. The program will involve seed collection from within the strategic assessment area with a view to using that resource for Box–Gum Woodland restoration within the Barrer Hill Restoration Area (see **Figure 5** for location). Seed will also be stored for potential use in future restoration projects.

The program will be delivered through six key restoration stages. The activities are outlined in the NES Plan and will include engaging with local stakeholder groups and project partners, referencing current plans and strategies and applying best practice techniques. An adaptive management process will be used so that restoration interventions can be tailored based on system responses and changing circumstances.

12 Hassel, 2012, *Molonglo River Park Concept Plan Report*, prepared for the ACT Government Environment and Sustainable Development, August 2012
13 Ibid, p.1

Indirect Offset 2

PINK-TAILED WORM-LIZARD RESEARCH PROJECT
(Commitment 43)

Scientific data, especially in relation to the management and conservation of the Pink-tailed Worm-lizard in, and adjacent to, areas of urban development, is incomplete.

The potential indirect effects of urban development include weed spread, increased feral animal predation, direct disturbance by people traversing habitat, construction of urban infrastructure such as roads and inappropriate management of asset protection buffers.

It is an objective of the ACT Government to ensure that the potential for residential impacts on the Pink-tailed Worm-lizard be avoided or mitigated. To better understand how to achieve this objective, the ACT Government is undertaking an indirect offset in the form of a research project examining the long term survival of the Pink-tailed Worm-lizard in an urbanised landscape.

The research project will adopt a tri-staged approach:

1. Mount Taylor, a reserve unit within Canberra Nature Park, is surrounded by an urban matrix (housing, roads, facilities, easements etc). The focus of this first stage of the study will be:

   a. habitat disturbance, including fragmentation, and the effect of habitat proximity to urban areas, and

   b. in accordance with the draft National Recovery Plan for Pink-tailed Worm-lizards (Brown 2010), develop low-impact survey and monitoring techniques for the species.

   The outcomes of this research will be applied to management within the East Molonglo strategic assessment area.

2. The results of the Mount Taylor study will be incorporated into the second stage of the project. The second stage will involve the following sub-projects:

   c. extensive survey work to determine population densities in areas of low, moderate and high quality Pink-tailed Worm-lizard habitat in the strategic assessment area,

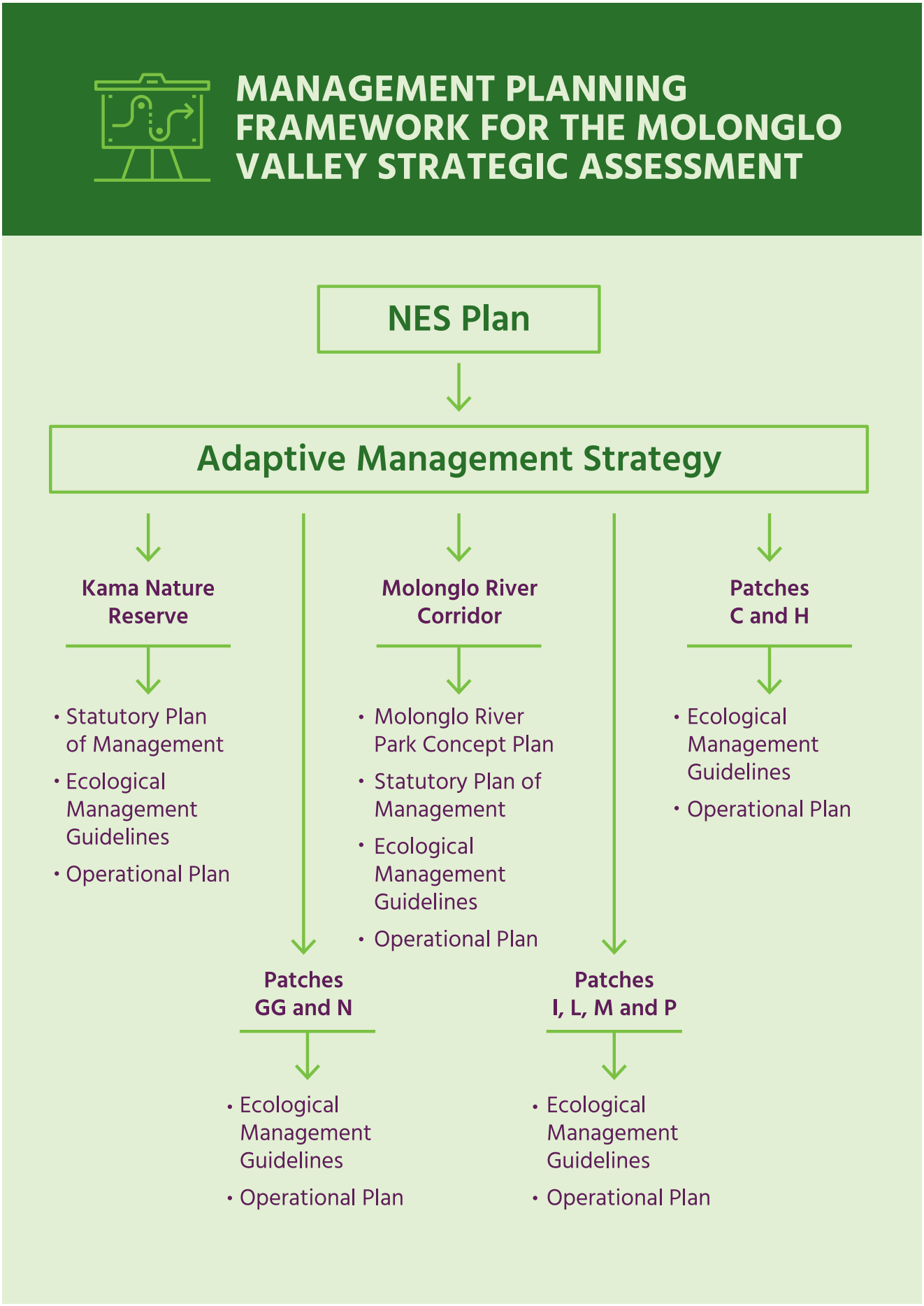
   d. field trials, to be conducted in areas of low quality habitat only, involving different methods of translocation, and

   e. research and field trials involving methods for reducing habitat fragmentation and increasing connectivity.

3. The NES Plan commitments include the monitoring of Pink-tailed Worm-lizard in the strategic assessment area. This monitoring is vital to ensure the long term survival and enhancement of the lizard population. Monitoring also provides a warning system should the population and/or habitat begin to show any signs of decline.

   This third stage of the project provides a link between the stage two research and the monitoring of Pink-tailed Worm-lizard in the strategic assessment area. Where population and habitat monitoring show any change to baseline data (established prior to Stage 2 development) the results of the stage two research will be applied to establish possible causes and to mitigate adverse impacts.

FIGURE 7: MANAGEMENT PLANNING FRAMEWORK FOR THE MOLONGLO VALLEY STRATEGIC ASSESSMENT



4

Case Studies and Commentary

EDGING INTO NATURAL AREAS

Dr Philip Gibbons

Associate Professor, Fenner School of Environment and Society, the Australian National University

Urban development poses several threats to biodiversity. However, there are actions that governments and residents can take in the Molonglo Valley to minimise these impacts.

Edge effects

Suburbs pose several threats to native flora and fauna in neighbouring bushland: unrestrained pets, invasive plants and animals, stormwater runoff and bushfire.

Pet cats in Australia collectively kill around 167,000 birds per day.[1] They also kill a range of small reptiles, mammals and even invertebrates such as butterflies. A cat containment policy is an important conservation measure in suburbs within 1 kilometre of natural areas since pet cats can roam this distance.[2]

Although there is mandatory cat containment in all new suburbs of the Molonglo Valley, there is evidence from the RSPCA that compliance with cat containment declines with time.[3] Ongoing education and enforcement of cat containment is therefore critical.

Pet cats kill 167,000 birds per day in Australia. Cat containment is therefore an important conservation action in urban areas. Source Philip Gibbons

Development of new suburbs in Canberra has coincided with declines of native birds from adjacent bushland.[4] Reasons for this are unclear, but some of Australia's most aggressive native birds such as the Red Wattlebird, Noisy Miner, Rainbow Lorikeet and Pied Currawong thrive in suburbs and may be pushing other native birds out of neighbouring bushland. Avoiding garden plants that attract these aggressive species to our suburbs (e.g., nectar-rich Grevilleas and Callistemons and prolific fruiting plants such as Cotoneaster) may be one solution.[5]

Approximately 15 per cent of Australia's plant species are exotic and this is increasing at the rate of about 10 new species annually.[6] Weeds represent a threat to biodiversity in Australia because they displace native plants and change habitat; and are virtually impossible to eradicate once established.

Urban areas are a known source of weeds that invade adjacent bushland. Garden escapes in the ACT include Cootamundra Wattle, Common Pampas Grass and Cotoneaster. Urban open space in Canberra's suburbs often becomes dominated by two significant weeds: African Lovegrass and Chilean Needlegrass. Weed control within reserves is undermined where adjacent suburbs support large source populations of invasive plants.

Suburbs contain many hard surfaces such as roofs, roads and footpaths and therefore represent a source of considerable stormwater runoff. Stormwater runoff carries large quantities of sediment and nutrients from lawns, leaves, wildlife faeces and leaking sewage infrastructure. This all drains into adjacent waterways. Blooms of blue-green algae in Canberra's waterways have been traced to these sources.[7] Unless managed carefully, stormwater from new suburbs in the Molonglo Valley will impact upon native species in the Molonglo River and downstream, such as the Platypus, Murray Cod and Murray River Crayfish.

Bushfires represent a threat to urban communities located next to bushland, but protecting urban communities from bushfires can also represent a threat to wildlife. Asset Protection Zones (APZs) cleared of most trees and shrubs are maintained around suburbs adjacent to bushland in the ACT.

Good planning can limit the impact of APZs on biodiversity. Designing new suburbs so the perimeter is a road and APZs are within the urban footprint—rather than adjacent bushland—reduces impacts on native wildlife.

1 Woinarski, J., et al., *How many birds are killed by cats in Australia?* Biological Conservation, 2017. 214: p. 76-87
2 Meek, P.D., *Home range of house cats Felis catus living within a National Park.* Australian Mammalogy, 2003. 25(1): p. 51-60
3 Brown, A., *Cats captured from Canberra's cat containment suburbs on the increase*, in *The Canberra Times*. 2017, Fairfax Media: Canberra
4 Rayner, L., et al., *Are protected areas maintaining bird diversity?* Ecography, 2014. 37(1): p. 43-53
5 Ikin, K., et al., *Key lessons for achieving biodiversity-sensitive cities and towns.* Ecological management & restoration, 2015. 16(3): p. 206-214
6 Department of the Environment and Energy. *Why are weeds a problem?* 2017; Available from: http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/why/index.html
7 Neil, R., *Report on the state of the watercourses and catchments for Lake Burley Griffin. Part 1. The Report.* 2012, Office of the Commissioner for Sustainability and Environment: Canberra

Some ecological restoration can be undertaken within APZs without increasing the risk to houses during bushfires. For example, rock quarried from new suburbs in the Molonglo Valley has been used to create additional habitat for the Pink-tailed Worm-lizard (a Vulnerable species). These areas also support low levels of fire fuel hazard.[8]

Rock removed from urban developments has been used to create habitat for the Pink-tailed Worm-lizard in the Molonglo Valley and at the same time reduce bushfire hazard. Source Phillip Gibbons

Connectivity

Urbanisation also contributes to the fragmentation of wildlife populations. Connectivity between wildlife populations is important because it reduces inbreeding, facilitates recolonisation of bushland patches when species have become locally extinct (e.g. because of bushfire) and it allows species to move across landscapes, which is important for those affected by climate change.

Stepping stones of suitable habitat within urban areas helps connect wildlife populations.

For example, one study found that nearly a third of Canberra's native birds depend on mature eucalypts.[9] However, most mature trees are cleared as suburbs are developed and those retained are often removed when they begin senescing. Retention and protection of mature eucalypts within the suburbs of the Molonglo Valley will improve connectivity for native birds and bats.

Roads represent a physical barrier to movement by some native species and a significant source of mortality for others. On Tasmanian roads it is estimated that 290,000 native animals are killed annually—or 33 animals every hour.[10] The list of native species that are killed on roads in Australia includes numerous mammals, birds, reptiles and amphibians. Increased roads and traffic in the Molonglo Valley will represent an increasing threat to native fauna. Underpasses, barrier fencing and speed limits have all been suggested as ways to mitigate impacts of roads on wildlife.

Mature, dying and dead eucalypts represent important stepping stones for native birds and bats in urban areas. Source Philip Gibbons

No silver bullet

Threats work together to impact upon biodiversity in urban areas. For example:

- nectar-rich plantings in gardens attract hyper-aggressive birds to suburbs,
- APZs on the edges of suburbs provide less cover for small birds seeking to evade these hyper-aggressive species, and
- cats are more effective hunters of small birds in these open habitats.

Thus, there is no silver bullet for conserving biodiversity in or adjacent to urban areas.

Effective conservation in the Molonglo Valley will require a series of coordinated actions by government and the community.

8 McDougall, A., et al., *Restoration rocks: integrating abiotic and biotic habitat restoration to conserve threatened species and reduce fire fuel load.* Biodiversity and conservation, 2016. 25(8): p. 1529-1542

9 Le Roux, D.S., et al., *Single large or several small? Applying biogeographic principles to tree-level conservation and biodiversity offsets.* Biological Conservation, 2015. 191: p. 558-566

10 *roadkilltas.com.au*. Available from: http://roadkill.imaginocean.com.au/

Case Study 1

BARRER HILL RESTORATION PROJECT: BIRDS, BATS AND BUGS

The installation of vertical habitat structures

The vertical habitat structures project is an innovative restoration initiative at Barrer Hill, in the Molonglo River Reserve. In collaboration with ANU researchers at the Fenner School of Environment and Society, this study will shed light on the effectiveness of this restoration method for biodiversity in modified landscapes.

In a place where there are few trees, these vertical habitat structures provide a space for roosting birds and insects. This project has been underway since 2014 and includes a 50 hectare area on the northern bank of the Molonglo River, across from the new suburb of Coombs.[11]

Restoration work has included removal of pine trees. They have been replaced with native shrubs and trees, and the community assisted with these plantings. Extensive weed removal has also taken place.

A key part of the project has been to return habitat structures to the area to provide shelter for native wildlife while the planted trees grow. This has been in the form of salvaged rocks, logs and dead trees.[12]

EPSDD completed Stage 3 of the Box–Gum Woodland restoration project in 2016–17.

Added tree structure on Barrer Hill. Source Kate Auty

As part of Stage 3, ten vertical habitat structures, 400 course woody debris logs and 80 tonnes of surface rock were installed in the restoration area to provide habitat for threatened and non-threatened Box–Gum Woodland species. The ten habitat structures were made up of five utility poles and five relocated mature trees, enriched with carved hollows and artificial bark providing habitat for invertebrate, bird, bat and marsupial species. Within hours of installation, insects arrived and a bird roosted immediately.

An Australian National University (ANU) honours project (Fenner School of Environment and Society) on the effect of installation of these artificial habitat structures on bird and bat species, has produced interesting results. As expected, the relocated trees proved to be more beneficial than the installed utility poles for increasing bird species richness in this modified landscape. The artificial structures had no effect on bat species richness or composition, however a *Nyctophilus* species was observed roosting on an artificial structure immediately following installation.

The retention of large mature trees in the landscape is critical, as the artificial structures were unable to replicate their function. However, in a degraded landscape where mature trees are not present, artificial structures do provide temporary habitat while plantings are becoming established.[13]

11 ACT Government, *Barrer Hill Restoration Project*, https://www.environment.act.gov.au/parks-conservation/environmental-offsets/connections-with-rivers/molonglo-valley-offset-areas/barrer-hill-restoration-project, accessed 13 February 2018

12 Ibid

13 Hannan, L. 2017, *Artificially replicating mature trees for birds and bats in modified landscapes*, Fenner School of Environment and Society, Australian National University

The installation of pink tree guards to protect the newly planted seedlings

At the site visit on 3 January 2018, the restoration work undertaken on Barrer Hill was observed, with the seedlings protected by tree guards. Approximately 50,000 shrubs, trees and grasses have been planted in this area. Species were selected to reduce the fire danger of the area, given the close proximity to residential areas.

The tree guards are designed to protect seedlings from:

- herbicide drift,
- wind,
- predation from hares, rabbits and wallabies, and
- adverse conditions such as sand blasting and frost.

They also increase humidity and concentrate carbon dioxide levels which improves plant growth.[14]

WHY PINK?

During the process of photosynthesis, green leaves absorb light from the red fraction of the visible light spectrum. As such, research undertaken in the ACT has demonstrated that pink reflects and focuses the red fraction of the spectrum onto the plant inside the tree guard which will concentrate the photosynthetic energy and enhance plant growth.[15]

Plantings at Barrer Hill. Source Kate Auty

TRAINING UP STUDENTS AS PART OF THE MOLONGLO VALLEY STRATEGIC ASSESSMENT

"The opportunity to work on this project for my honours year was by far the highlight of my university experience and one which should be offered to more students. It gave me the ability to work with and learn from experienced ecologists working on pressing environmental issues and to make a genuine contribution to the literature and research in this area of conservation and restoration.

It provided me with useful career skills and experience, such as developing monitoring techniques and research design. Whilst many honours projects provide this experience, working on this project was different due to its novel and ambitious nature. It was also different due to the ACT Government ecology staff who consistently went above and beyond in assisting with the research design and survey implementation. In comparison to my undergraduate courses, this experience provided me with skills which broadened my career options and introduced me to an area I am now passionate about."

Lucy Hannan, 21 February 2018.

14 https://www.globallandrepair.com.au/products/the-ultimate-tri-cone-tree-guards/, accessed 19 February 2018
15 https://www.globallandrepair.com.au/products/the-ultimate-tri-cone-tree-guards/, accessed 19 February 2018

Expert Commentary

REHABILITATION OF HABITAT IS A IMPORTANT COMPONENT OF THE RECOVERY AND FUTURE VIABILITY OF THE NATIONALLY VULNERABLE PINK-TAILED WORM-LIZARD (*APRASIA PARAPULCHELLA*) IN THE LOWER MOLONGLO VALLEY

Dr Will Osborne

Adjunct Associate Professor

Institute for Applied Ecology, University of Canberra

The Pink-tailed Worm-lizard (*Aprasia parapulchella*) is a threatened species found mainly in the Canberra region.[16] [17] It was described in 1974 from specimens collected on the rocky slopes of the Molonglo River at Coppins Crossing in the ACT.[18] Because it lives in ant nests beneath rocks, it is rarely observed and can be very difficult to find, even if present at a site.

Most records of the Pink-tailed Worm-lizard are from the ACT, although in recent years there have also been an increasing number of records from NSW at very widely-separated locations along the foothills of the western slopes of the Great Dividing Range. Most of these sites in NSW are very isolated and threatened by weed invasion, pasture improvement, cropping and urban expansion.[19] Because of the lease system for farmland in the ACT there has been less pasture improvement and this is one explanation for the much higher abundance of the lizards in the ACT.[20]

Genetics of Pink-tailed Worm-lizard populations

There has been one study of genetic variation in Pink-tailed Worm-lizards.[21] This study reported that there were high levels of genetic variation in the ACT populations and that levels of genetic differentiation between sites was also high, indicating high levels of subdivision between almost all populations sampled. This indicates that there has been no modern dispersal between the sites sampled (all sites were separated by at least one kilometer). The differences in genetic variation were best explained by the presence of biogeographic barriers such as rivers, exotic pine forest and a lack of rocky habitat.

The data from the genetic study by Knopp *et al.*[22] provides important confirmation of the isolation of individual populations and supports the view that the lizards have been mainly confined to patchy, open, rocky landscapes. This finding is of considerable importance in the context of protecting the species' habitat within landscape corridors such as in the Lower Molonglo Valley where former pine plantations, pasture improvement and roads have further fragmented their habitat.

Distribution and Abundance in the ACT

The first records of Pink-tailed Worm-lizards were from the ACT and, as mentioned above, all were from Coppins Crossing in the Molonglo Valley (just upstream of the present day bridge). Follow-up surveys confirmed that the species has a much broader distribution in the ACT.[23] [24] The most extensive populations occur along the slopes of the Molonglo and Murrumbidgee River Corridors and on many adjacent outlying hills that still support native ground cover (e.g. Mount Taylor, Cooleman Ridge, Urambi Hills, The Pinnacle and Mount Stromlo).[25] Most sites with the species in the ACT occur within nature reserves (Canberra Nature Park, Murrumbidgee River Corridor, Molonglo River Corridor). The highest densities and largest known populations of the species have been recorded in the Lower Molonglo Valley where the species is patchily distributed along

16 ACT Government, 2017, *Pink-tailed Worm-lizard Threatened Species Action Plan*, ACT Government, Canberra

17 Wong D. T. Y., Jones, S. R., Osborne, W. S., Brown, G. W., Robertson, P., Michael, D. R. and Kay, G. M, 2011, *The life history and ecology of the Pink-tailed Worm Lizard Aprasia parapulchella* Kluge – a review. *Australian Zoologist* 35, 927-940

18 Kluge, the A.G., 1974, *A taxonomic revision of the lizard family Pygopodidae*, *Miscellaneous Publications of the Museum of Zoology University of Michigan* 47, 1-221

19 Wong D. T. Y., Jones, S. R., Osborne, W. S., Brown, G. W., Robertson, P., Michael, D. R. and Kay, G. M, 2011, *The life history and ecology of the Pink-tailed Worm Lizard Aprasia parapulchella* Kluge – a review. *Australian Zoologist* 35, 927-940

20 Wong, D.T.Y., Osborne, W.S., Sarre, S.D. and Gruber, B., 2018, *Remotely sensed agricultural modification improves prediction of suitable habitat for a threatened lizard*, *International Journal of Geographic Information Science* https://doi.org/10.1080/13658816.2018.1428747

21 Knopp, T., Gruber, B., Osborne, W., Wong, D. and Sarre, S., 2012, *Conservation genetics of the pink-tailed worm lizard (Aprasia parapulchella) in the ACT: What can population genetics tell us about habitat fragmentation and conservation priorities in the face of urban expansion?* Report to the ACT Government, Institute for Applied Ecology, University of Canberra

22 Knopp, T., Gruber, B., Osborne, W., Wong, D. and Sarre, S., 2012, *Conservation genetics of the pink-tailed worm lizard (Aprasia parapulchella) in the ACT: What can population genetics tell us about habitat fragmentation and conservation priorities in the face of urban expansion?* Report to the ACT Government, Institute for Applied Ecology, University of Canberra

23 Osborne, W.S. and McKergow, F.V.C., 1993, *Distribution, population density and habitat of the pink-tailed legless lizard, Aprasia parapulchella in Canberra Nature Park*, ACT Parks and Conservation Service, Technical Report 3

24 Osborne, W.S., Lintermans, M.A. and Williams, K.D., 1991, *Distribution and conservation status of the endangered pink-tailed legless lizard Aprasia parapulchella* (Kluge), Research Report 5, ACT Parks and Conservation Service, Canberra

25 Wong D. T. Y., Jones, S. R., Osborne, W. S., Brown, G. W., Robertson, P., Michael, D. R. and Kay, G. M, 2011, *The life history and ecology of the Pink-tailed Worm Lizard Aprasia parapulchella* Kluge – a review. *Australian Zoologist* 35, 927-940

the entire 20 kilometre length of the Molonglo River Corridor reserve network.[26] [27]

There are also records of the species in the Molonglo Valley from leasehold farmland (e.g. the Huntly and Spring Valley properties) where the lizards are confined to suitable habitat that has not been ploughed or pasture improved.

Many sites in the Molonglo Valley are located within or at the edge of areas that are currently being developed as urban areas in the Molonglo Valley and at west Belconnen.

Importance of Habitat in the Lower Molonglo Valley

From what is known, the Molonglo Valley has the largest population of the lizard within its known range in Australia. Moreover, habitat quality in the Molonglo Valley Strategic Assessment area is particularly high (most habitat patches were assessed to be of a high quality).[28] [29]

The ACT region provides the main stronghold for the Pink-tailed Worm-lizard.[30] This extensive population links with other populations in the Murrumbidgee River Corridor. For these reasons the Molonglo population is considered to be of national conservation significance (Commonwealth Environment Protection and Biodiversity Conservation Act 1999) and the ACT community holds considerable responsibility for the protection of this Vulnerable species.

Potential habitat for the Pink-tailed Worm-lizard in the Molonglo Valley Strategic Assessment area and along the entire length of the Lower Molonglo River Corridor Reserve has now been completely mapped by the ACT Government (see **Figure 6**). However, some areas on adjacent farmland to the west of the strategic assessment area have been mapped only by remote sensed imagery and have not been checked on the ground.[31] Habitat in very good condition (mapped as "high" quality and "moderate" quality) occurs in extensive patches along the entire 20 kilometre length of the Molonglo River Corridor. The most extensive habitat occurs along the southern bank of the river (i.e. the north-facing slopes).

Importance of Connectivity of Habitat

Maintaining potential in the landscape for dispersal between different populations is an important consideration in the conservation of wildlife.

Connectivity helps prevent the processes that affect very small populations – reduced gene flow, inbreeding, genetic drift and the loss of small populations due to unpredictable events. The hill-side slopes and gorges associated with the Molonglo River provide a very important potential linkage between near urban populations of Pink-tailed Worm-lizards at Kama and Pinnacle Nature Reserves, Spring Valley Farm (conservation agreement ANU), Mount Stromlo Forest Park, the Murrumbidgee River Corridor and west Belconnen area. Fortunately, much of this landscape is now protected in a series of linear conservation reserves. By contrast, most populations within Canberra Nature Park are now completely isolated by the suburbs that surround the reserves.

Preventing the development of infrastructure in the Molonglo Valley that will further isolate populations of Pink-tailed Worm-lizards is of paramount importance to the effective long-term conservation of the species in this part of the ACT.

Moreover, implementing measures to increase connectivity at locations where past human activities have impacted on habitat within wildlife corridors is a very high priority (e.g. areas that were pine plantations, degraded areas and major roads).

Constructing bridges in such a way that suitable habitat is maintained beneath major bridges is a challenge, and requires further planning. Recent successful protection of occupied habitat during construction of the main trunk sewer and footbridge immediately downstream of Coppins Crossing provides a good example of how this might be achieved. However, the increased shading and lack of rainfall under very wide or low bridges is likely to be a challenge for constructing and maintaining habitat that Pink-tailed Worm-lizards and other reptiles might move through.

Pink-tailed Worm-lizard habitat restoration and fence. Source Kirilly Dickson

26 ACT Government 2017, *Pink-tailed Worm-lizard Threatened Species Action Plan*, ACT Government, Canberra

27 Wong D. T. Y., Jones, S. R., Osborne, W. S., Brown, G. W., Robertson, P., Michael, D. R. and Kay, G. M, 2011, *The life history and ecology of the Pink-tailed Worm Lizard Aprasia parapulchella* Kluge – a review. *Australian Zoologist* 35, 927-940

28 Osborne, W. and Wong, D., 2010, *Extent of potential Pink-tailed Worm-lizard (Aprasia parapulchella) habitat in the Stage 2 Investigation Area - East Molonglo*, Report commissioned by ACT Planning and Land Authority. Institute for Applied Ecology, University of Canberra

29 Wong, D. and Osborne, W.S., 2010, *Confirmatory surveys for Pink-tailed Worm Lizards (Aprasia parapulchella) and additional mapping of habitat along the Molonglo River Corridor between Coppins Crossing and Tuggeranong Parkway, ACT*, Report commissioned by ACT Planning and Land Authority. Institute for Applied Ecology, University of Canberra

30 Wong D. T. Y., Jones, S. R., Osborne, W. S., Brown, G. W., Robertson, P., Michael, D. R. and Kay, G. M, 2011, *The life history and ecology of the Pink-tailed Worm Lizard Aprasia parapulchella* Kluge – a review. *Australian Zoologist* 35, 927-940

31 Wong, D. T. Y., 2013, *Environmental factors affecting the occurrence and abundance of the Pink-tailed Worm-lizard (Aprasia parapulchella) in the Australian Capital Territory*, PhD thesis, University of Canberra

Restoring Pink-tailed Worm-lizard Habitat

The ACT Government, in co-operation with the Fenner School at ANU, has established field research plots in the Molonglo Valley Strategic Assessment area. These plots involve the use of habitat manipulations (placement of surface rock combined with plantings of suitable native grasses) to determine an optimal approach to managing suitable habitat for Pink-tailed Worm-lizards. A second aim of the study is to examine approaches to reducing fire risk.

The trials are still underway, however the responses after one year were encouraging: rock restoration combined with herbicide application was found to meet the widest range of restoration goals. Lizards colonized the restored habitat within a year, the restoration reduced fire fuel load, increased ant occurrence (the primary prey of the lizards), and increased the growth and survival of native grasses. Despite this promising start, continued studies are needed to confirm the suitability of this technique in the longer term. It is possible, for example, that the experimental sites will become over-grown with tall, rank vegetation (including weeds) and become shaded, thus reducing suitability for the lizards and ants. Continued monitoring of the plots is being undertaken to address this and other possibilities. Successful techniques will later be applied at a landscape scale across a number of areas within the Molonglo River Reserve, aiming to improve habitat connectivity while also controlling fuel loads.

In a second experiment in the Molonglo Valley Strategic Assessment area, the ACT Government has commenced research into techniques for rehabilitating Pink-tailed Worm-lizard habitat that were previously disturbed by human activity (e.g. in parts of the Molonglo River Corridor Reserve that were previously pine forest). Rock of a suitable size obtained from nearby development sites has been used to make artificial habitat islands that form a series of "stepping stone" patches linking occupied habitat on either side of disturbed areas downstream of Coppins Crossing. These habitat patches have been constructed to mimic the natural density and extent of surface stones at typical sites that support the lizards. The construction of the first set of trials involved a set of eleven habitat "islands" (patches) bridging a distance of one kilometre.

Early indications are that this project has been successful with ten of the eleven previously unoccupied patches now occupied by at least a few individuals that have moved in from nearby occupied habitat. The challenge remaining will be to see if any habitat patches constructed in other areas that are important for rehabilitation, but which are more isolated from existing populations, will also become occupied. Priority for future habitat construction and rehabilitation should focus on increasing connectivity through the landscape near Coppins Crossing, including any areas that will be disturbed during the construction of new bridges over the Molonglo River. Connectivity of habitat on the north side of the river is naturally quite low, and an assessment should be made as to whether some of these areas would benefit from the construction of additional habitat. An important area for rehabilitation of habitat is the area that was pine forest at Misery Point (now Barrer Hill). These management activities will require long-term monitoring to gauge the extent of their success.

Effective use of Buffer Zones to Protect Habitat

In keeping with Commonwealth policy, the ACT Government has adopted the use of 20 metre wide buffer zones around all Pink-tailed Worm-lizard habitat areas in the Molonglo Valley Strategic Assessment area.[32] The function of the buffer zone is to assist in the protection of the habitat areas. It should be noted that the 20 metre wide buffer is located outside of the actual habitat, extending outwards from the edge of the actual habitat. Well-managed buffer zones can be very effective at protecting habitat areas from disturbances such as trampling, weeds, pollutants and the spread of sediments.

It is very important that buffer zones are not confused with inner and outer asset protection zones.

The fire prevention activities that are likely to occur within asset protection zones are not compatible with conservation of Pink-tailed Worm-lizard habitat. Adherence to the management procedures recommended in the reserve and offset areas management plan[33] will comprise an important part of ensuring that effective and well-managed buffer zones continue to play an important role in the protection of populations in the Molonglo Valley Strategic Assessment area.

32 ACT Planning and Land Authority, 2011, *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance (the NES Plan)*, ACT Planning and Land Authority, Canberra

33 ACT Government 2015, *Molonglo Reserve and Offset Areas, Ecological Management Guidelines, ACT Government*, Territory and Municipal Services Directorate, Canberra

Case Study 2

HABITAT CONNECTIVITY — WHETHER YOU ARE A BIRD OR A LIZARD

Restoration of Pink-tailed Worm-lizard habitat

One of the key focuses of the Molonglo Valley Strategic Assessment is the protection and enhancement of Pink-tailed Worm-lizard habitat. The area is a hotspot for the reptile in the ACT and nationally.

Not a great deal is known about this species. They have been described as 'cryptic'.

Particularly challenging is orchestrating habitat restoration to join several fragmented populations of the Pink-tailed Worm-lizard. This is being undertaken in the Molonglo Valley as is required by the indirect offset requirements in the strategic assessment.

Pink-tailed Worm-lizard is typically associated with rocky areas within Natural Temperate Grassland. These sites tend to be well drained and contain numerous scattered rocks (between 10–30 centimetres in diameter), partially embedded in the soil and grass. The lizard feeds on the eggs and larvae of the ants within the nests under these rocks.[34]

The habitat restoration to date has been extensive, with approximately 3000 tonnes of rock being placed strategically into the river corridor reserve to encourage Pink-tailed Worm-lizards to colonise the area.[35]

As a result of a history of agriculture and forestry in the area, the populations of Pink-tailed Worm-lizard within the Molonglo Valley are now severely fragmented.

The objective of habitat restoration is to connect these fragmented populations. Maintaining potential in the landscape for dispersal between different populations is an important consideration in the conservation of this species. Connectivity helps prevent the processes that negatively affect very small populations, such as reduced gene flow, inbreeding, genetic drift and the loss of small populations due to unpredictable events.

Over the past four years, the ACT Government has undertaken habitat restoration for the species in the Molonglo Valley by placing scattered surface rock between isolated rocky patches to improve habitat connectivity and facilitate dispersal of individuals. 11 habitat islands were established across the former Blewetts pine plantation. The objective of the restoration works was to improve habitat connectivity between the two genetically distinct populations.

Pink-tailed Worm-lizards have subsequently been detected in ten of the 11 habitat islands since their establishment in 2014. This leaves only one island to be colonized before the two populations are effectively reconnected (see **Figure 8**).[36]

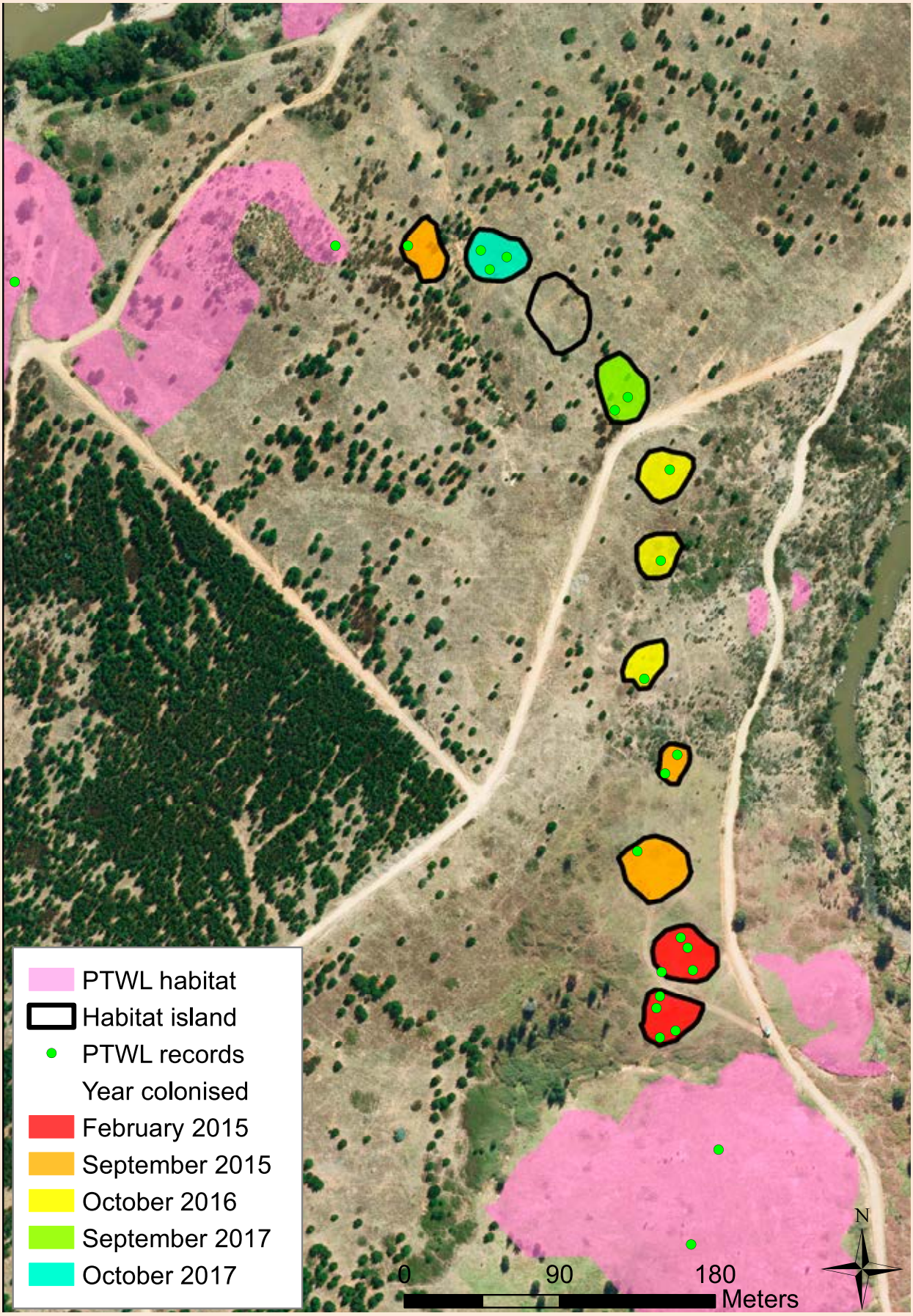
Pink-tailed Worm-lizard habitat restoration opposite Barrer Hill. Source Kate Auty

34 Pink-tailed Worm-lizard Action Plan, https://www.environment.act.gov.au/__data/assets/pdf_file/0008/1068281/Pink-tailed-Worm-lizard-Aprasia-parapulchella.pdf, accessed 27 February 2018

35 Pers comms Ecologist, Parks and Conservation Service Projects, site visit 3 January 2018

36 Pink-tailed Worm-lizard Action Plan, https://www.environment.act.gov.au/__data/assets/pdf_file/0008/1068281/Pink-tailed-Worm-lizard-Aprasia-parapulchella.pdf, accessed 27 February 2018

FIGURE 8: PINK-TAILED WORM-LIZARD HABITAT EXTENSION 2018



Superb Parrot breeding and climate change

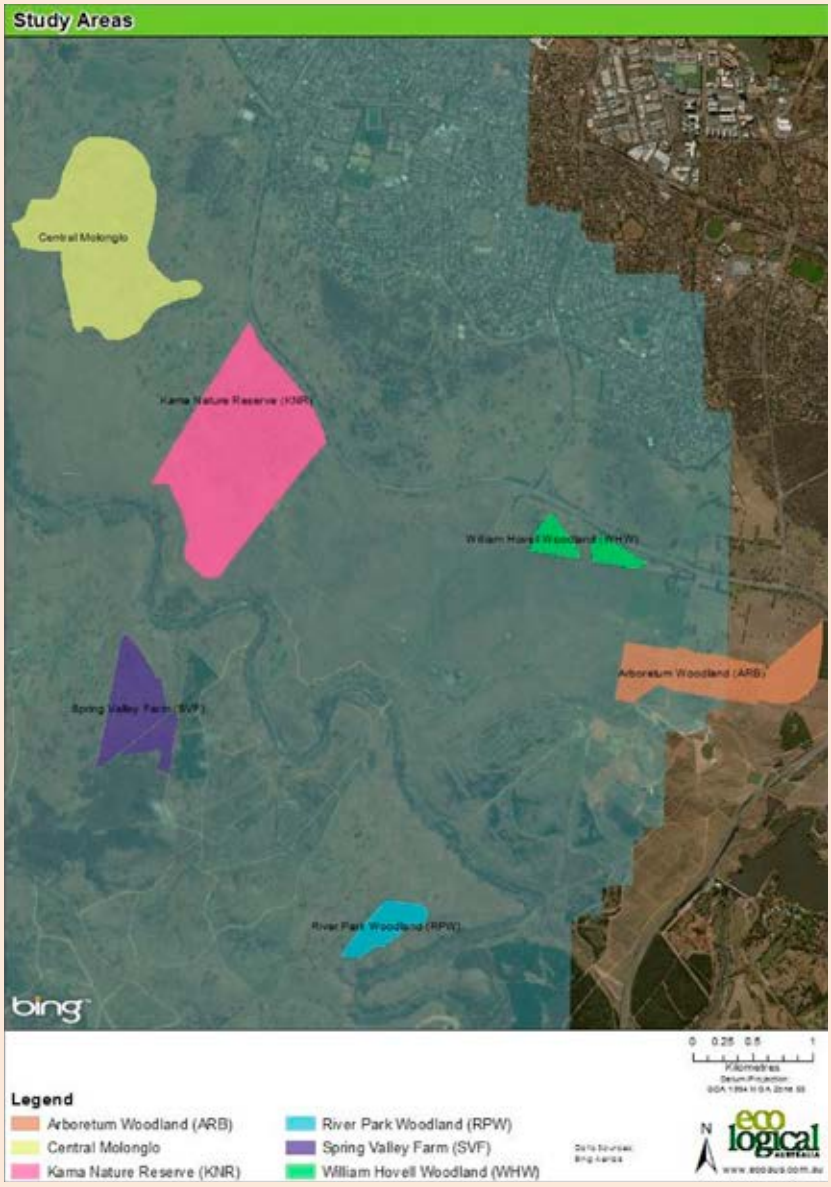
The Superb Parrot is one of the MNES protected within the Molonglo Valley Strategic Assessment area as part of the commitments relating to maintenance and enhancement of Box–Gum Woodland.

This parrot relies on nesting trees in the Molonglo Valley and Throsby (Gungahlin).[37]

The presence of breeding populations of the Superb Parrot within the ACT is a relatively recent phenomenon; until 2005–06, the species was rarely recorded breeding here.[38]

In surveys undertaken in 2013, the species was recorded as breeding at two locations in the Molonglo Valley; Spring Valley Farm (adjacent to Patches I, L, M and P in the strategic assessment area) and Central Molonglo (north-west of Kama Nature Reserve). For locations of these two areas, see **Figure 9**.[39]

FIGURE 9: STUDY AREA OF THE 2013 SUPERB PARROT SURVEYS



The Superb Parrot has been observed foraging within Kama Nature Reserve and within native and non-native vegetation in the broader Belconnen area. The bird is highly mobile and will take advantage of foraging resources some distance from breeding areas. This confirms the importance of retaining the links between Central Molonglo, Spring Valley Farm and other woodland patches in the Molonglo Valley in order to retain habitat requirements for the bird to continue to breed in this location.

Further surveys were undertaken in spring and summer of 2015. These surveys identified foraging by Superb Parrots in the Spring Valley area but it was not considered to be a critical breeding area.[40]

Surveys undertaken from September 2016 to January 2017 identified no trees being used for nesting within Spring Valley, despite extensive searches in 469 trees. Numbers of parrots breeding in Throsby (Gungahlin) was also lower than previous years.[41]

37 ACT Commissioner for Sustainability and the Environment, 2017, *Independent Audit of the Gungahlin Strategic Assessment*
38 Ecological Australia Pty Ltd, 2014, *Molonglo NES Plan Superb Parrot Survey: Baseline Survey 2013*, prepared for Territory and Municipal Services
39 ACT Commissioner for Sustainability and the Environment, 2017, *Independent Audit of the Gungahlin Strategic Assessment*
40 Rayner, L., Stojanovic, D., Heinsohn, R. and Manning, A., 2016, *Technical Report: Breeding ecology of the Superb Parrot Polytelis swainsonii in northern Canberra*, Fenner School of Environment and Society, ANU
41 Rayner, L., Stojanovic, D., Heinsohn, R. and Manning, A., 2017, *Technical Report: Breeding ecology of the Superb Parrot Polytelis swainsonii in northern Canberra, 2016 Nest Monitoring Report*, Fenner School of Environmental and Society, ANU

Case Study 3

COMMUNITY ENGAGEMENT

Boardwalk designed to avoid damaging primary Pink-tailed Worm-lizard habitat

The Holdens Creek Boardwalk. Source Kate Auty

Right: *Holdens Creek lookout showing the sun reaching the Pink-tailed Worm-lizard habitat underneath through the mesh. Source Richard Milner*

The Holdens Creek Boardwalk provides a rare opportunity for members of the public to enter into and examine Pink-tailed Worm-lizard habitat while having minimal impact.

The impact of the boardwalk was minimised by having a specialist ecologist on site during construction to identify the route with the least impact on the surrounding Pink-tailed Worm-lizard habitat. This was achieved by ground-truthing habitat mapping and choosing a route that did not impact on any areas of high or moderate quality habitat. The final route of the boardwalk largely followed a well-used animal track that was heavily weed infested in sections and supported minimal rock habitat.

Impacts were further reduced by maximising light penetration below the boardwalk – this was achieved by using large mesh diameter grating and elevating the boardwalk as high as possible.

Extensive weed control work has been undertaken adjacent to the boardwalk and native grass seeding was undertaken following construction.[42]

42 Pers comms Ecologist, Parks and Conservation Service Projects, email sent 5 January 2018

Forb restoration at Barrer Hill

Ground cover restoration has been an ongoing challenge at this site. Due to the history of the area (which has included pasture improvement and heavy grazing), one of the key barriers to restoration was weed management, particularly Blackberry and Phalaris. In order to start a clean slate for restoration, the top 15 centimetres of the soil was scalped, and native seed from 45 species was sown directly into the area. Within a couple of years, approximately 30 native plant species have been identified. Seedlings of the Button Wrinklewort and Hoary Sunray have also been planted in this area.

The Land Development Agency and Greening Australia collaborated to create the *Molonglo Valley Local Native Plant Guide* to assist residents in selecting plants for their gardens.

This guide describes groundcovers, grasses, shrubs and small trees and provides details about frost or drought tolerance. It also outlines which native birds or insects will use the plant as a food source. It guides residents in choosing local plant species to encourage native fauna into their backyards.[43]

Barrer scrape site before scraping. Source Richard Milner

Barrer scrape site 18 months after scraping and seeding. Source Richard Milner

43 http://suburbanland.act.gov.au/plantguide/native_plant_guide.html, accessed 19 February 2018

Restoration of Natural Temperate Grassland Elsewhere in the Region

Greening Australia have undertaken extensive restoration of Natural Temperate Grassland at the Scottsdale Reserve five kilometres north of Bredbo in NSW. This project is a great example of how Greening Australia engages the community across the region in native grassland conservation. Citizen scientists can see the positive results from targeted restoration techniques. This case study can be considered as a means to guide the Natural Temperate Grassland restoration in the Molonglo Valley.

In April 2014, two patches of weedy grassland were fenced and prepared for restoration using a combination of scraping, burning and weed spraying. A specialised grass-seeding machine was used to sow a mix of 11 native grasses and 30 wildflower species directly into the soil.

In November 2014, a preliminary assessment was undertaken which identified 19 of the 41 species sown in the site, with a number of other natives. The rate of germination was around 80 plants per square metre. By October 2016, the coverage of native species was impressive (see photo below).

Yellow Box site before treatment. Source Greening Australia

Yellow Box scalp looking south. Source Greening Australia

Yellow Box site October 2016. Source Greening Australia

Hoary Sunray in Yellow Box site, October 2016. Source Greening Australia

Maintenance of the grassland sites at Scottsdale has involved a significant workforce of volunteers, providing a valuable opportunity for community engagement in grassland conservation.

Key areas of community engagement in this project were:

- weed control mostly being undertaken by hand which requires the volunteers to develop good plant identification skills,
- supplementary planting being undertaken by volunteers in areas of the grassland where seedling germination was sparse. The tubestock planted was propagated from seed collected on Scottsdale, and grown in the community nursery on the reserve, and
- volunteers collected significant quantities of seed from the restoration sites to use in future restoration activities. This seed is often difficult to collect from wild populations in any meaningful amounts.[44]

44 Taws, N. updated 2018 *Native Grassland Restoration at Scottsdale Reserve*, Greening Australia

5

Community Engagement

Community Engagement During Early Stages of the Strategic Assessment

The *Molonglo River Concept Plan Report* [1] seeks to address sensitive issues for a range of community and government stakeholders. From the time of project inception on March 2011, selected community environmental and recreation groups were consulted on the development of the Molonglo River Concept Plan Report. This included:

- The Molonglo Community and Industry Reference Group, and
- The Conservation Council ACT Region.

Input was sought from the community through workshops, field trips and the Molonglo community forums held in March, May and June 2011.

Consultation on the Molonglo River Concept Plan Report revealed support for:

- management impacts of the urban area of Pink-tailed Worm-lizard,
- provision of funding for effective long-term management of weed and restoration of habitats,
- requirement for an established scientific baseline for effective monitoring, evaluation and reporting of change in condition of habitats and species,
- further scientific research regarding the ecological requirements of the Pink-tailed Worm-lizard, and
- impacts of fire management requirements in APZs on areas of quality habitat.[2]

The Molonglo River Concept Plan Report provides a framework for the preparation of the statutory management plan for the Molonglo River Reserve. This management plan is subject to approval by the Conservator of Flora and Fauna and the Legislative Assembly.

The Molonglo River Reserve Draft Reserve Management Plan was released for public comment on 8 February 2018. Comments received will be considered as part of finalising the management plan.

Community Engagement During Implementation of the Strategic Assessment

MINGLE – COMMUNITY DEVELOPMENT IN THE MOLONGLO VALLEY [3]

The Suburban Land Agency (SLA) recognises the importance of complementing its master planning, land development and sales activities with a focus on the social and community aspects of establishing and developing new and sustainable communities.

The SLA's community development program, **Mingle**, is designed to build local communities within new ACT Government greenfield estates. The program aims to achieve a number of social objectives based around encouraging new residents to feel part of the community and become involved in community life and activities. Mingle assists residents to create networks, groups and programs that will ultimately become self-sustaining.

The program is tailored for each suburb to suit demographics, resident feedback and proximity to surrounding services. This may include the partnership with local community service organisations such as Communities@Work. The SLA works closely with other ACT Government Directorates to help meet program objectives and to deliver events.

The Mingle Community Development Program responds to a broader view of sustainability where the social aspects of land development are considered equally with environmental and economic issues. It is also recognised that creating communities that are enjoyable, interesting and responsive to peoples' needs, is something that the SLA would like to see.

The SLA has two key Mingle goals:

1. to create and implement a range of sustainable community activities which are ultimately owned and championed by the community, and
2. to achieve high levels of satisfaction from local community groups, key stakeholders and residents throughout the lifetime of the project – which is approximately 2–5 years from the commencement of Mingle in a development.

1 Hassel, 2012, *Molonglo River Park Concept Plan Report*, prepared for the ACT Government Environment and Sustainable Development, August 2012, https://www.planning.act.gov.au/topics/current_projects/studies/molonglo_river_park_concept_plan, accessed 1 March 2018

2 Ibid

3 28 February 2018, Corporate Marketing and Community Development Manager, Suburban Land Agency, ACT Government

Checking out the invertebrates under the installed bark. Source Molonglo Mingle Program

GUIDING PRINCIPLES

Five guiding principles have been identified and referred to in the development of the Mingle Business Plan. These principles serve both as a guide and reference point to check progress of the plan and ensure it is meeting project objectives in the way that is intended.

MINGLE PROGRAM OBJECTIVES

- Provide opportunities that encourage new residents to feel a part of the community, become involved in community life and participate in community building events.
- Provide and promote opportunities for social interaction and the development of social networks within the community.
- Support the establishment and growth of community initiatives, interest groups and community organisations.
- Promote identity and sense of place through community and cultural development activities and strategies.
- Promote a range of activities and programs that meet the social, leisure, educational and recreational needs of residents.
- Develop strategies which assist the new community to integrate with the surrounding existing communities.

'MINGLE' COMMUNITY ENGAGEMENT SUMMARY

Total Mingle events/activities delivered for Wright and Coombs residents from 2013 – 2018 = 111.

- Activity delivery summary – fitness classes, tree planting, ranger walks, wine tasting, barista session, Biggest Morning Tea for Cancer Council, Dogs Day Out, Seniors catch up, Stromlo Cottage history session, energy efficiency workshops, Brumbies promotions, Christmas Carols, Eid Fest, Easter Egg Hunt, Astronomy Night, Movie Night, Technology Education, play group, Community Sports Day.
- Community involvement – pop up cafe, volunteer program, book boxes (Charles Weston School, Wood Workers Guild), gift giving initiative for St Vincent de Paul raising over 400 items, establishment of a Molonglo Valley Community Group, monthly resident meetings, newsletter walking delivery group.
- Industry – first ACT group Work for the Dole project to deliver a six month landscaping project for Stromlo Cottage (76 participants).
- Innovation – first ACT Government Community Information Session using Facebook live streaming – November 2016.
- Community surveys – reviewing event program and event delivery.
- Sports/fitness – engagement with Molonglo Hornets Touch Football, local fitness trainers, development of local fitness guide encouraging activation of fitness equipment.
- Parks and Conservation – delivery of Ranger Walks (October 2015, April 2017) and tree planting activities (May 2014, August 2016, August 2017).
- Education – links to existing school programs and for Charles Weston School involvement in the 'Passions and Pursuits' Program, Actsmart energy efficiency, ranger walks and tree planting.

- Sustainability – partnership with the ACT Government's Actsmart program to deliver a series of free sustainable workshops to purchasers, tree planting, communal composting trial in Stromlo Terrace apartments (2017–18).
- Heritage – partnership with ACT Property Group to refurbish the Stromlo Cottage property for use as a Mingle community facility.

Book Box in the Molonglo Valley. Source Molonglo Mingle Program

INTERPRETIVE SIGNAGE

The interpretive signage installed in the Molonglo River Reserve to communicate the work that is being undertaken to implement the Molonglo Valley Strategic Assessment is extensive and impressive. Signage included details on the Barrer Hill Box–Gum Woodland restoration site and the Pink-tailed Worm-lizard habitat enhancement areas, as well as a map of the Molonglo River Reserve and details on the aquatic species that can be found in the river.

Weeds to Wildflowers signage. Source Kate Auty

It is important to strike a balance between engaging the community by generating interest in the natural areas that surround the suburbs and ensuring that appropriate protection is given to the threatened species that live in these nature reserves. This is demonstrated in the photo of the Pink-tailed Worm-lizard sign outlining details of the species and what individuals can do to help the lizard in the area, while separating the restored habitat from easy public access with a fence. This fence was chosen as it has an open design which enables people to see the habitat without disturbing the lizards.

Pink-tailed Worm-lizard interpretive signage and fence around habitat to keep visitors out. Source Kate Auty

Engaging the Community Through the Media

One of the ways in which the community has been, and continues to engage with the Molonglo Valley Strategic Assessment, is through the media.

During the time of the independent audit, the Molonglo Valley area featured in the news on several occasions. Topics included the Superb Parrot nesting sites shifting due to climate change, repair of erosion control work for Coombs ponds and a call for volunteers to assist in identifying photos for the Superb Parrot research project.

7 DECEMBER 2017 – CANBERRA BECOMING SUPERB PARROT CENTRAL FOR NOT-SO-SUPERB REASONS (ABC NEWS)

Superb Parrot chicks are hatched inside gum tree hollows. Source ABC News article

Superb Parrots are listed as Vulnerable species in the EPBC Act and surveys are being undertaken in the ACT to increase our understanding of these special birds. The research is showing that Superb Parrots are being pushed out of their natural range by climate change and land clearing, and this issue requires urgent, long-term action.[4]

Superb Parrots migrate over a large area of eastern Australia, settling in southern areas (including ACT) in spring to nest and breed. Approximately 95 per cent of the Box–Gum Woodland, breeding habitat for the parrot, has been cleared. As a result, the Superb Parrot is forced to compete for nesting hollows with more aggressive bird species.

"While we were seeing some positive signs for the Superb Parrot in Canberra, we were also seeing some concerning trends elsewhere in their range."

—Dr Laura Rayner, ACT Government ecologist.

Sightings of the bird are becoming more common in the ACT. Climate modelling undertaken by researchers at ANU suggests that the changing climate is already causing the birds' natural range to contract. The modelling predicts that in 50–70 years, the breeding areas in the ACT will become Superb Parrot central and are likely to be the most

4 Allen, C., 2017, *Canberra becoming superb parrot central for not-so-superb reasons*, http://www.abc.net.au/news/2017-12-07/canberra-superb-parrot-changing-habitat/9207150, accessed 7 December 2017

important areas for the population in Australia as discussed in the case study on page 44 of this report.

In order to cope with this increase in Superb Parrot numbers, the ACT Government needs to start preparing these landscapes to provide more nesting hollows.

"So we need to start preparing now because, as most people would appreciate, you can't grow a tree hollow in five years, [or] 10 years, it takes 50 years."

—Dr Laura Rayner, ACT Government ecologist.

Suburban development in the Molonglo Valley will bring urban areas closer to these Superb Parrot nesting sites. This represents an opportunity learn more about how the species responds to disturbance and how to make our suburbs more wildlife friendly.

20 FEBRUARY 2018 – AUDIT FINDS BUILDERS' LAX APPROACH TO EROSION CONTROL IN THE ACT (CANBERRA TIMES)

A report by the ACT Auditor-General highlighted a number of key failings in the processes for handing over stormwater assets, as well as the damage caused to them after handover. Due to the combined failure to install erosion controls and a lack of the ACT Government enforcing erosion and sediment rules, the ACT Government paid $750,000 to undertake erosion repair work on the Coombs ponds last year.[5]

20 FEBRUARY 2018 – SNAP AND SAVE SUPERB BIRD (NORTHSIDE CHRONICLE)

The ACT Government recently installed more than 32 cameras at the entrances to tree hollows, which have captured over a million wildlife images, ranging from possums to galahs. This article called for volunteers to help identify these images to assist in answering questions about Superb Parrots. Questions include 'how much competition is the Superb Parrot facing', 'are they losing these important hollows to competitor birds' and 'can they hang onto their spot once occupied'?

Climate change research (ANU) suggests that the key breeding areas of the Superb Parrot may move south-east, increasing populations in the ACT. This would mean the Territory could become a critical space for Superb Parrot breeding, and thus the long-term survival of the species in Australia.[6] For this reason this citizen science contribution, encouraged by the media, is of vital importance.

5 Burdon, D. in the Canberra Times on 20 February 2018, http://www.canberratimes.com.au/act-news/builders-lax-approach-on-erosion-control-in-act-compared-to-queanbeyan-audit-20180219-h0wb3q.html, accessed 28 February 2018

6 McNamara, B. in Northside Chronicle 20 February 2018, *Snap and save superb bird*

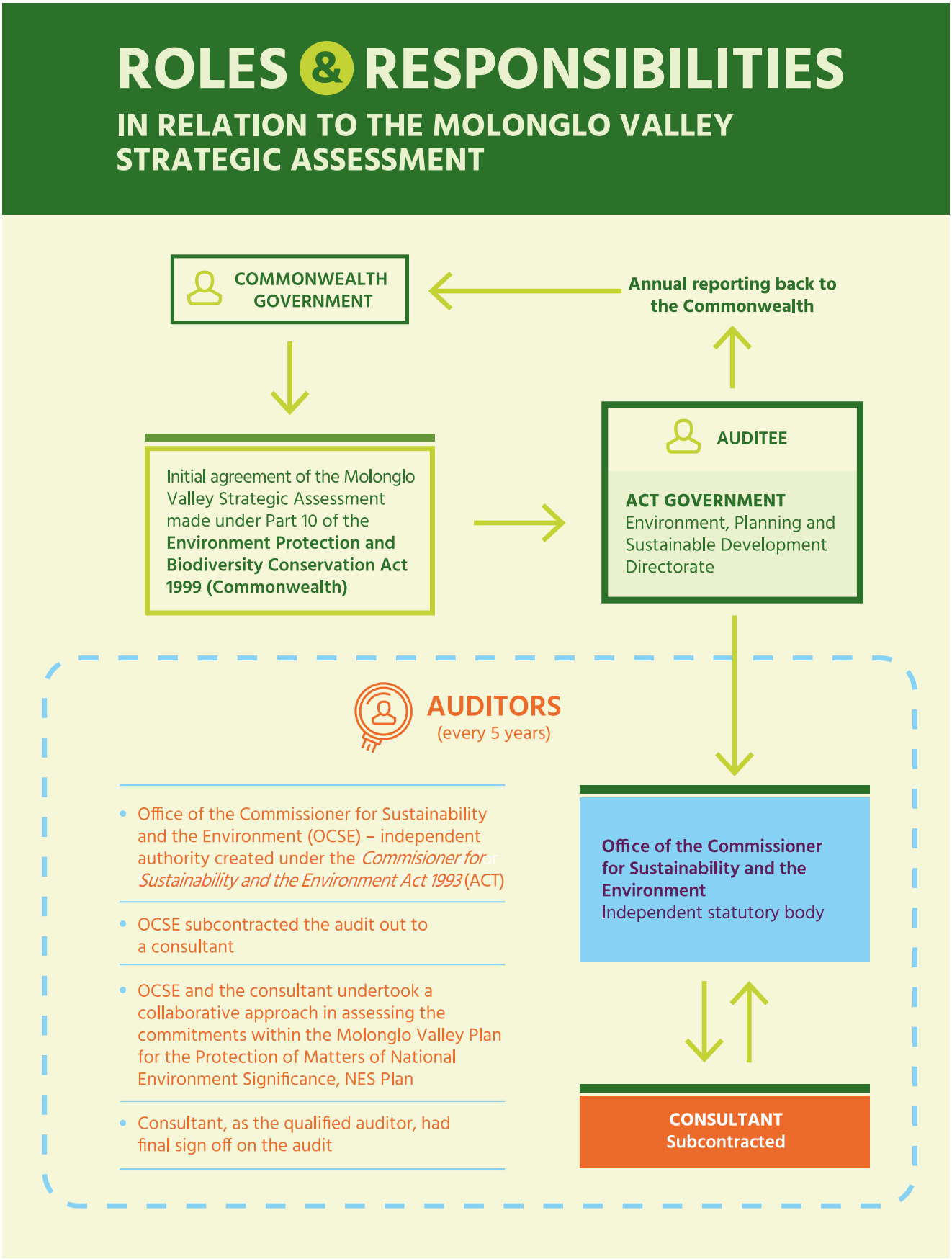
6

Approach to the Audit and Methodology

The audit team was established in November 2017, comprising of staff from OCSE and Arup. The audit team and their experience is reflected in **Appendix A**.

An audit plan was developed by the audit team to outline the approach to the audit and identify roles and responsibilities.

The roles and responsibilities of different parties in relation to the Molonglo Valley Strategic Assessment are outlined below.



Methodology of the Audit

The Audit Criteria Methodology Template which has guided this audit is found at Appendix B of the *Independent Audit and Audit Report Guidelines for controlled actions which have been approved under Chapter 4 of the EPBC Act*.[1]

The ISO19011 audit process,[2] the international standard that provides guidelines for management systems auditing, has also been referenced.

Audit Assessment Criteria

The objectives of this audit are guided by Ministerial Terms of Reference, which include:

1. assessment of all approval commitments as being *Compliant*, *Non-compliant* or *Undetermine*d,
2. issuing corrective actions as appropriate, and
3. noting any observations.

Further assessment criteria were established by the audit team, namely:

- compliance was assessed against the commitments as phrased and approved,
- compliance was assessed in terms of the status in meeting the requirements of each commitment, against dates and timelines specified in the NES Plan,
- where a commitment output had been officially endorsed or accepted by the Commonwealth, the commitment has been deemed compliant, and
- where required, the NES Plan was referenced to assist interpretation of the meaning of commitments in relation to the required deliverable.

Risk Assessment

A risk rating has been applied to all commitments.

The risk assessment methodology used is the ACT Insurance Authority Risk Matrix which is outlined below. Risk rating is a function of the likelihood of the impact occurring and the consequence of the impact.

Where risks are rated as moderate or higher this is accompanied by an *Observatio*n or *Corrective Action Request*.

1 Australian Government Department of the Environment, 2015, *Independent Audit and Audit Report Guidelines for controlled actions which have been approved under Chapter 4 of the EPBC Act,* http://www.environment.gov.au/system/files/resources/76c1a1c5-a793-432f-9e3e-f85fb75fb039/files/independent-audit-report-guidelines.pdf, accessed 8 November 2017

2 https://www.iso.org/standard/50675.html, accessed 13 November 2017

ACTIA
Australian Capital Territory Insurance Authority

ACT Government

Last Update: 1 Sept 2017

Consequence	Insignificant	Minor	Moderate	Major	Catastrophic
Assets	Loss or destruction of assets up to $2,000	Loss or destruction of assets $2,000 to $10,000	Loss or destruction of assets $10,000 to $100,000	Loss or destruction of assets $100,000 to $5M	Loss or destruction of assets greater than $5M
Compliance/ regulation	Non-compliance with work policy and standard operating procedures which are not legislated or regulated	Numerous instances of non-compliance with work policy and standard operating procedures which are not legislated or regulated	Non-compliance with work policy and standard operating procedures which require self reporting to the appropriate regulator and immediate rectification.	Restriction of business operations by regulator due to non-compliance with relevant guidelines and / or significant non-compliance with policy and procedures which threaten business delivery.	Operations shut down by regulator for failing to comply with relevant guidelines and /or significant non-compliance with internal procedures could result in failure to provide business outcomes and service delivery.
People	Injuries or ailments not requiring medical treatment.	Minor injury or First Aid Treatment Case.	Serious injury causing hospitalisation or multiple medical treatment cases.	Life threatening injury or multiple serious injuries causing hospitalisation.	Death or multiple life threatening injuries.
Environment	Limited effect to something of low significance	Transient, minor effects	Moderate, short-term environmental harm	Significant, medium-term environmental harm	Long term environmental harm
Financial	1% of Budget or <$5K	2.5% of Budget or <$50K	> 5% of Budget or <$500K	> 10% of Budget or <$5M	>25% of Budget or >$5M
Products and Services	No disruption to services	Minor disruption to services for up to 1 month	Total cessation of service for up to 1 days and subsequent disruption of 1 to 2 months	Total cessation of service for up to 7 days and subsequent disruption of 2 to 3 months	Total cessation of service for more than 1 week and disruption over subsequent months involving a major facility
Technology	Interruption to electronic records and data access less than ½ day.	Interruption to electronic records and data access ½ to 1day	Significant interruption (but not permanent loss) to data and electronic records access, lasting 1 day to 1 week	Complete, permanent loss of some electronic records and/or data, or loss of access for more than one week	Complete, permanent loss of all electronic records and data
Reputation & Image	Internal Review	Scrutiny required by internal committees or internal audit to prevent escalation.	Scrutiny required by external committees or ACT Auditor General's Office, or inquest, etc.	Intense public, political and media scrutiny. E.g.: front page headlines, TV, etc.	Assembly inquiry or Commission of inquiry or adverse national media.
Cultural & Heritage	Low-level repairable damage to commonplace structures	Mostly repairable damage	Permanent damage to items of cultural significance	Significant damage to structures or items of cultural significance	Irreparable damage to highly valued items of cultural significance
Business Process & Systems	Minor errors in systems or processes requiring corrective action, or minor delay without impact on overall schedule.	Policy procedural rule occasionally not met or services do not fully meet needs.	One or more key accountability requirements not met. Inconvenient but not client welfare threatening.	Strategies not consistent with Government's agenda. Trends show service is degraded.	Critical system failure, bad policy advice or ongoing non-compliance. Business severely affected.

Likelihood	Frequency				Matrix	1	2	3	4	5
	Almost Certain	Is expected to occur in most circumstances	Once in a quarter or more	>1 in 10	5	Medium	High	High	Extreme	Extreme
	Likely	Will probably occur	Once a year or more	1 in 10 - 100	4	Medium	Medium	High	High	Extreme
	Possible	Might occur at some time in the future	Once every 1 - 5 years	1 in 100 – 1,000	3	Low	Medium	Medium	High	Extreme
	Unlikely	Could occur but doubtful	Once every 5 - 20 years	1 in 1,000 – 10,000	2	Low	Medium	Medium	High	High *
	Rare	May occur but only in exceptional circumstances	Once every 20 - 100 years	1 in 10,000 – 100,000	1	Low	Low	Medium	Medium	High *

Priority for Attention / Action		
Priority	Suggested Timing of Treatment	Authority for continued tolerance of risk
Extreme	Short term – normally within one month * Detailed action plan required	Director- General
High	Medium term – normally within three months Needs senior management attention	Senior Executive
Medium	Normally within 1 year Specify management responsibility	Managers
Low	Ongoing control as part of a management system Manage by routine procedures	All staff

Risk Control Effectiveness	
Control Effectiveness	Guide
Adequate	Nothing more to be done except review and monitor the existing controls. Controls are well designed for the risk, are largely preventative and address the root causes and Management believes that they are effective and reliable at all times. Reactive controls only support preventative controls.
Room for Improvement	Most controls are designed correctly and are in place and effective however there are some controls that are either not correctly designed or are not very effective. There may be an over-reliance on reactive controls. Some more work to be done to improve operating effectiveness or Management has doubts about operational effectiveness and reliability.
Inadequate	Significant control gaps or no credible control. Either controls do not treat root causes or they do not operate at all effectively. Controls, if they exist are just reactive. Management has no confidence that any degree of control is being achieved due to poor control design and/or very limited operational effectiveness.

Hint:
To help make an assessment of consequence and likelihood as yourself the following questions.
1. What is the consequence that the risk would take in the most normal form should it eventuate?
2. What is the likelihood of that consequence?

Note:
When identifying, analysing and rating risk consideration should be given, but not necessarily limited to, the attached categories of risk and the suggested examples of frequency and consequences.

*** Priority for Attention / Action**
Every care should be taken to act as soon as possible to implement risk control measures wherever possible or to take action to fix the problem. Extreme and High risk especially where the risk relates to people and personal injury require us to act immediately to take steps to fix the problem.
The suggested timing of treatment does not mean that immediate action ought not be taken or that the timing can not be completed sooner than suggested.

Definitions of Audit Status

Categories of *Audit Status* used in the audit table below have been taken from the *EPBC Act Independent Audit and Audit Report Guidelines*[3] and have been altered slightly to reflect the requirements of the current audit.

All categories of *Audit Status* have been given a risk rating which reflects the auditors' analysis of the risks associated with achievement of each commitment. This process has resulted in the identification of key risks and allows EPSDD to prioritise ongoing management requirements in respect of implementation of the Molonglo Valley Strategic Assessment.

This strategic assessment has a further 24 years in which to deliver outcomes and it will be audited every 5 years until completion.

Compliant

The auditors have deemed a commitment '*Compliant*' where it has been found to comply with the specific requirements of the NES Plan.

Compliant with Observation

The auditors have used this assessment where the commitment is compliant at the time of the audit according to the NES Plan, but where issues relevant to that commitment have been noted, to inform and assist with future management. In this assessment, the auditors have observed a deficiency in documentation or actions which has impacted, or has potential to impact, on the ability to meet a commitment.

Non-compliant

This audit categorisation relates to the non-fulfilment of a specified requirement of the NES Plan within the required timeframe.

Undetermined

When a commitment falls inside the scope of the audit but there is insufficient evidence to make a judgement on compliance or non-compliance at the time the audit was undertaken, the categorisation '*Undetermine*d' has been used.

Not Applicable

Where a specific requirement of the NES Plan relevant to the site falls outside the scope of the audit, or has not been triggered, this categorisation has been used.

Corrective Action Request

Corrective Action Requests have been made by the Commissioner for Sustainability and the Environment where the relevant government agency should undertake action to either:

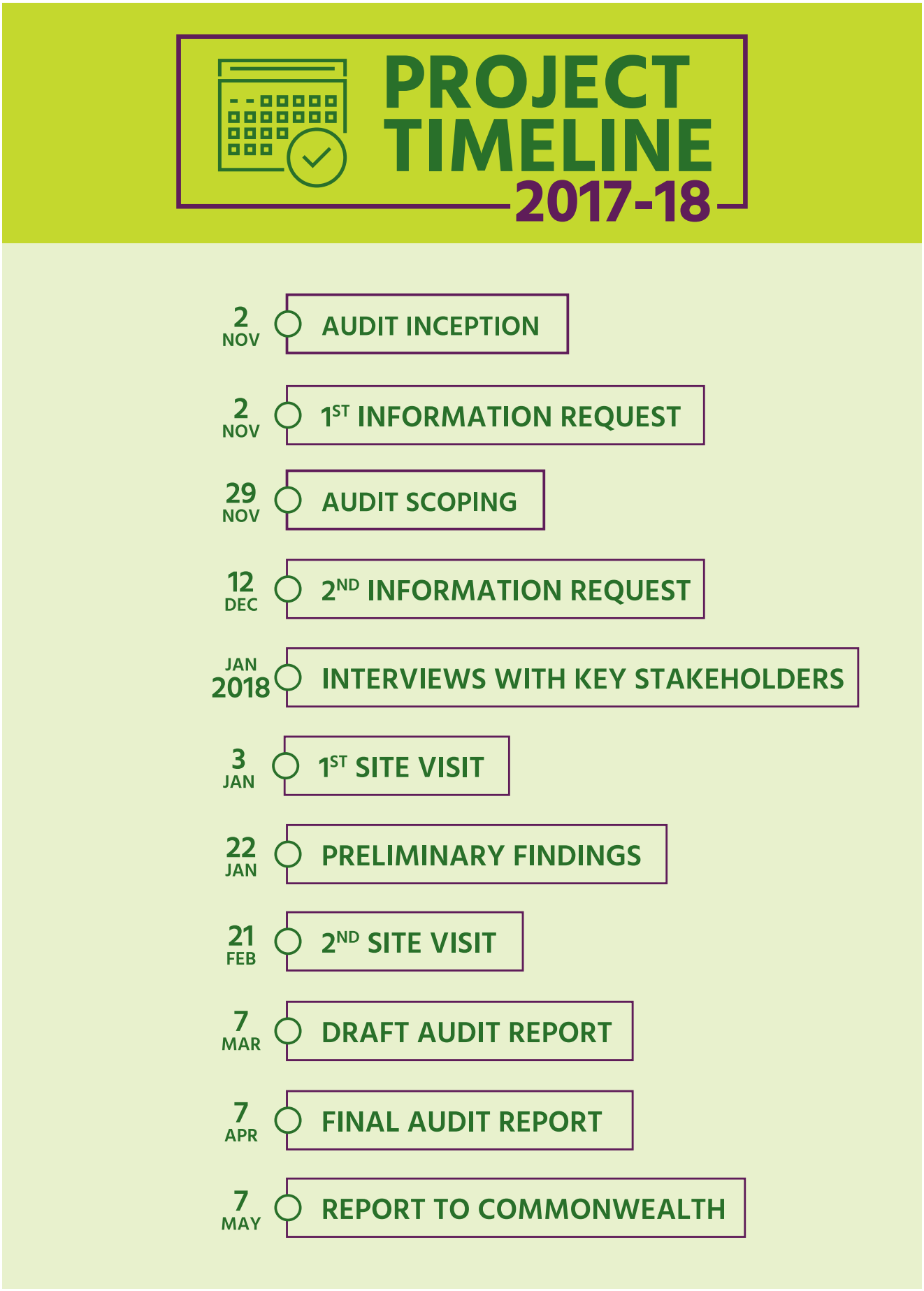
- eliminate the cause of a non-compliance,
- reduce risks associated with a non-compliance, or
- prevent the non-compliance re-occurring in relation to meeting the intent of the relevant commitment.

View of the Molonglo River from Holdens Boardwalk. Source Kirilly Dickson

3 Department of the Environment, 2015, *EPBC Act Independent Audit and Audit Report Guidelines*, https://www.environment.gov.au/epbc/publications/independent-audit-report-guidelines, accessed 31 October 2017

Undertaking the Audit

The key steps in undertaking this audit are shown in the following timeline.



Sources of Information Reviewed

Evidence was sourced in a number of ways including:

- site visits (3 January 2018 with eight participants and 21 February 2018 with six participants),
- research of publically available information,
- direct emails to key stakeholders to seek information,
- discussions and meetings with key stakeholders such as the Impact Assessment Team in EPSDD, staff from the SLA and staff from Parks and Conservation Services, and
- correspondence, reports, minutes and other documentation.

The EPSDD Impact Assessment Team coordinated two formal information requests, as well as responding to follow-up requests by providing further information on specific commitments.

The Impact Assessment Team also coordinated the response from ACT Government on the Preliminary Findings of the audit and the draft report of the Independent Audit of the Molonglo Valley Strategic Assessment.

Hoary Sunray at Barrer Hill. Source Kate Auty

Audit of Implementation of the Molonglo Valley Strategic Assessment

Summary of Audit Table Results

- Commitments rated as *Compliant with Observation* are mostly due to the long-term nature of the Molonglo Valley Strategic Assessment and the necessity to track the achievement of project objectives. At this early stage of the project, ecological baselines are still being established and therefore it is too early to determine whether habitat condition has been maintained and enhanced.
- The majority of commitments rated as *Non-compliant* are due to the required timeframe not being met.
- The audit concludes that four commitments rated as *Non-compliant* carry high risks and as such, Corrective Action Requests have been issued.
- Separate commitments in the NES Plan were designated to each of the MNES (Box–Gum Woodland, Natural Temperate Grassland and Pink-tailed Worm-lizard). As such, commitments are overlapping, e.g. Commitments 5, 25 and 32 are all in relation to the development of a management plan for the Kama Nature Reserve, however, each commitment covers one of the MNES.

A summary of the audit results in **Table 1** below.

TABLE 1: SUMMARY OF AUDIT TABLE RESULTS

AUDIT STATUS	NUMBER OF COMMITMENTS
Compliant	16
Compliant with Observation	28
Non-compliant	11 (10 of these are due to the timeline not being met)
Undetermined	4
Not applicable	1
Total number of commitments	60

Key Risks Identified in the Audit

This section precedes the compliance table to illustrate the key risks which require action and which are particularly important given the long-term nature of strategic assessments. It outlines the key risks identified during the independent audit period.

These risks relate to future management of the Molonglo Valley Strategic Assessment (approved and endorsed on 7 October 2011) and the ability to meet the commitments in the NES Plan within the 30 year timeframe.

To date, the results of the on-ground implementation have been positive. Relevant authorities can build on this. The range of projects being undertaken (research, habitat restoration and threatened species translocation) is very diverse and will add to the knowledge of these MNES. This will be valuable for the Territory and, given these species are threatened across Australia, on a national scale as well.

A range of broad systemic risks (R) were identified (**Table 2**), as well as commitment-specific risks with associated Corrective Action Requests (CARs) (**Table 3**).

TABLE 2: BROAD SYSTEMIC RISKS

	IDENTIFIED RISK
R1	Resourcing and Funding: from establishment to implementation
R2	Implementation monitoring and condition enhancement
R3	Resilience to climate change
R4	Clear documented evidence trail
R5	Finalisation of key documents
R6	Finalisation of the Kama Nature Reserve buffer zone (Commitments 7, 27 and 34)

TABLE 3: CORRECTIVE ACTION REQUESTS FOR COMMITMENT-SPECIFIC RISKS

	CORRECTIVE ACTION REQUESTS	COMMITMENT	DUE DATE
CAR 1	Provide the final draft Molonglo River Reserve Management Plan to the Minister.	9 & 36	31 July 2018
CAR 2	Finalise the operational plan for Patch P to ensure appropriate management is occurring.	16	31 December 2018
CAR 3	Incorporate actions and monitoring requirements into relevant Land Management Agreements for the protection of the ecological condition of MNES within Patches I, L & M.	16	31 December 2018
CAR 4	Finalise the operational plan for the Pink-tailed Worm-lizard Conservation Area in the Molonglo River Reserve.	41	30 April 2018

Button Wrinklewort closeup. Source Kate Auty

Broad Systemic Risks

R1 – KEY RISK: RESOURCING AND FUNDING: FROM ESTABLISHMENT TO IMPLEMENTATION

Many of the commitments require establishment, maintenance and enhancement of ecological environments for the protection of the MNES. This includes commitments associated with corridors and connectivity as well as buffer zones for mitigation of ecological impacts and the management of fire and urban edge impacts.

Establishment funding has been in place for the audit period (first five years). This has enabled the deployment of:

- monitoring and evaluation,
- restoration and research projects, and
- sites to establish the ecological settings for the river corridor, Box–Gum Woodland, Natural Temperate Grassland and the Pink-tailed Worm-lizard.

Establishment has been cognisant of the fire protection zones, buffer zones and connectivity zones.

Sufficient resourcing and funding is required to be committed over the next 25 years to realise the maintenance and enhancement requirements of the MNES commitments. Resourcing and funding is needed at reasonable and ongoing levels to meet the intent of the commitments, particularly as staged release of development continues from planning through to deployment and on-ground activities.

Implementation of management and operational plans is required by many commitments after the development of the plans. Implementation requires sufficient resourcing and funding to ensure compliance.

RECOMMENDATION

Ensure ongoing resourcing and funding for the maintenance and enhancement of the ecological condition of MNES within the Molonglo Valley Strategic Assessment area.

R2 – KEY RISK: IMPLEMENTATION MONITORING AND CONDITION ENHANCEMENT

Implementing plans for the protection of MNES is required by numerous commitments. Evidence is required to demonstrate effectiveness of on-ground activities to provide for the maintenance and enhancement of ecological condition. Baseline and ongoing monitoring and statistical and other evaluation methods are required to provide evidence as to effects of on-ground actions.

The *Molonglo River Reserve Procedures Manual for Monitoring Vegetation and Habitat Condition (2014)* documents the approaches and protocols defining monitoring and evaluation techniques to determine ecological condition.

A vegetation condition monitoring program has been running in the Molonglo Valley Strategic Assessment area for the past five years and early results seem to demonstrate that the ecological condition of the strategic assessment area has been maintained. Given the complexity of the data and the various sites within the strategic assessment area, it is critical to have clear documentation of analysis of the data to determine if ecological condition of MNES has been maintained. Secondarily, documented evidence and analysis for enhancement requires demonstration post establishment of the baseline.

There is a level of uncertainty about the number of years of monitoring required to establish a baseline, as this will depend on multiple uncertain factors such as weather conditions and seasonal variations. The timeframe is anticipated to be between three and seven years. The data from the first five years of monitoring will be used to determine baselines to measure changes against and inform future management. Evaluation of implementation actions will also allow adaptive management to be utilised, a critical component of a thirty year project.

RECOMMENDATION

Clearly document analysis of the monitoring data to determine if the ecological condition of MNES has been maintained, and secondarily enhanced.

R3 – KEY RISK: RESILIENCE TO CLIMATE CHANGE

Climate change will impact the Molonglo Valley, the ACT and surrounding NSW area.

Responding to climate change is absolutely necessary during the 30 year term of the Molonglo Valley Strategic Assessment.

On-ground activities conducted now, that consider and take account of climate change impacts into the future, are more likely to achieve future compliance with the commitments.

'Plants are projected to be particularly badly hit, because they are often unable to adapt quickly enough to a changing climate – which in turn may have a knock-on effect on other species that depend on them.' [1]

There is some evidence of considering climate change resilience through implementation approaches such as consideration of seed stock location and diversity. Further action is critical, in order to ensure these environments are given assistance to adapt appropriately to respond to the difficult changes expected to occur in an evolving climate. To provide appropriate incorporation of these approaches into the future, the plans would benefit from identifying likely climate change impacts and planning for climate change resilience for on-ground activities.

RECOMMENDATION

Document the consideration of climate change resilience in the Molonglo River Reserve Management Plan and the operational plans for each area, including research to evaluate potential impacts on MNES.

R4 – KEY RISK: CLEAR DOCUMENTED EVIDENCE TRAIL

Many commitments require the development and implementation of plans and associated relevant documents within identified timeframes. There are also requirements regarding Annual Reports. Timeliness of achieving commitments is a critical element of responsible management and supports the protection of MNES values.

To ensure compliance the following is needed;

- documents need to be prepared within the required timeframes,
- documents need to be finalised, approved and contain document and version control, and
- documents need to map and provide evidence of implementation against each component of required plans.

Compliance would be improved and assured with a strong commitment to timely delivery, including finalisation and implementation, coupled with strong document control and management based on ISO 9001[2] or similar. International standard compliance would be supported by documents that provide clear evidence against each required plan and each element of implementation.

RECOMMENDATIONS

Finalise and approve all documents with appropriate document control systems.

Implement and adopt ISO 9001 or similar to control and manage documents that relate to the strategic assessment area, particularly those that are specified and are in support of compliance with the commitments.

1 WWF 2018, *Wildlife in a Warming World: The effects of climate change on biodiversity in WWF's Priority Places*, https://c402277.ssl.cf1.rackcdn.com/publications/1149/files/original/WWF_-_Wildlife_in_a_Warming_World_-_2018_FINAL.pdf?1520886759, accessed 15 March 2018

2 https://www.saiglobal.com/assurance/quality-business-management/iso9001.htm, accessed 6 March 2018

R5 – KEY RISK: FINALISATION OF KEY DOCUMENTS

Many commitments require the development and implementation of key documents, namely:

- the draft Molonglo River Reserve Management Plan (refer to CAR 1),
- Stage 3 Planning and Design Framework, and
- Stage 3 Estate Development Plan.

These documents set the key policies, guidelines, principles and operating approaches for the protection of MNES and hence enable and empower meeting of commitments. Through these documents, all on-ground management and restorative activities occur including design and delivery of infrastructure, planting and ecological restoration and ongoing research.

The AMS outlines a requirement to establish an expert panel of scientists and land managers with established expertise in the MNES relevant to the Molonglo Valley Strategic Assessment. The AMS states that the expert panel will convene every five years and provide a report containing advice and recommendations for any amendments necessary to ensure the operational plans are achieving the conservation outcomes and performance targets for the MNES.

This report is due by August 2018. This report is an important component of the adaptive management approach integral to ongoing implementation of the Molonglo Valley Strategic Assessment.

It is critical for compliance that these documents are finalised in a timely manner.

RECOMMENDATION

Finalise key documents as identified in R5.

R6 – KEY RISK: FINALISATION OF THE KAMA NATURE RESERVE BUFFER ZONE (COMMITMENTS 7, 27 AND 34)

The buffer for Kama Nature Reserve is a key component in providing protection for the fauna and flora in the reserve against urban edge effects.

The timing requirement for finalisation of this as outlined in the NES Plan forms part of the final Planning and Design Framework for Molonglo Stage 3. EPSDD noted that the Stage 3 Planning and Design Framework is currently in progress and is due to be completed in 2018.

A specific width for the Kama Nature Reserve buffer was not outlined in the NES Plan.

Studies have been undertaken to determine the most appropriate buffer size to meet the requirements of this commitment:

> *'The buffer will be developed to ensure that fire management is undertaken outside of the Kama Nature Reserve and will provide protection against urban edge effects.'* [3]

EPSDD stated that the established buffer will be consistent with the recommendations provided in the *Kama Interface Management Strategy* report prepared by Capital Ecology. However, the legal determination of the buffer will not be undertaken until preparation of the Estate Development Plan for Molonglo Stage 3. Until this document is finalised, the width of the buffer will not be final.

The ongoing management and monitoring requirements of the buffer zone have not yet been clearly outlined.

RECOMMENDATION

The final buffer for Kama Nature Reserve should be determined based on the recommendations provided in the *Kama Interface Management Strategy* report prepared by Capital Ecology in order to ensure protection against urban edge effects. Ongoing management and monitoring requirements of the buffer should also be outlined.

3 Commitment 7 and 27 in the NES Plan, https://www.environment.act.gov.au/__data/assets/pdf_file/0007/600964/NES_Plan.pdf, accessed 6 March 2018

Commitment-Specific Risks and Corrective Action Requests

CAR 1: DEVELOP AND FINALISE THE MOLONGLO RIVER PARK RESERVE MANAGEMENT PLAN

COMMITMENTS 9 AND 36

Commitments 9 and 36 includes the requirement to '*develop a management plan for the Molonglo River Park for the maintenance and enhancement of the ecological condition of Box–Gum Woodland (Commitment 9) and Pink-tailed Worm-lizard (Commitment 36) within the Park*'.

At the time of this audit the Molonglo River Reserve Management Plan is in draft.

It was required to be in effect by 7 April 2014. It is the core document in defining matters that reflect elements to protect, maintain and enhance MNES in the Molonglo River Park and Kama Nature Reserve.

It is noted that the draft Molonglo River Reserve Management Plan is currently open for public consultation, having been released on 8 February 2018. The draft plan outlines and identifies the key policies, objectives, principles and approaches for the Molonglo River Corridor for the protection of MNES. It is supported by several operational plans, which have been guiding on-ground activities until the management plan is in effect.

CORRECTIVE ACTION REQUEST

CAR 1 – Provide the final draft Molonglo River Reserve Management Plan to the Minister by 31 July 2018.

Any relevant items raised within this audit should be suitably addressed and included in the updated document.

CAR 2 AND 3: DEVELOP A MANAGEMENT PLAN FOR PATCHES I, L, M AND P

COMMITMENT 16

Commitment 16 requires the '*development of a management plan for the protection of Box–Gum Woodland in Patches I, L, M and P*'.

The management plan for Patches, I, L, M and P was required by 7 April 2014.

Patches I, L and M are managed as a rural lease with a Land Management Agreement, however, evidence suggests that these Land Management Agreements have not been updated since the commencement of the Molonglo Valley Strategic Assessment and therefore it is uncertain that the protection of Box–Gum Woodland is considered under these agreements.

Rural leases must have a Land Management Agreement in place. These agreements are approved by the Minister and signed by the Conservator of Flora and Fauna and the person leasing the property. The AMS notes that 'Land Management Agreements are the regulatory mechanism by which the NES Plan commitments and the AMS can ensure the conservation objectives for Box–Gum Woodland on rural leases are met.'[4]

Land Management Agreements were not available to be reviewed by the Auditors.

Anecdotal evidence indicates that the Land Management Agreements and rural leases may not reflect the inclusion of these lands into offset areas for the Molonglo Valley Strategic Assessment area. Specifically, these Land Management Agreements are unlikely to include land management activities that consider the MNES and do not operate in a manner connected to the areas operated and managed by EPSDD. Key activities such as weed, sediment and feral animal control as well as restorative and enhancement activities need to occur on these areas.

Patch P is now being managed by Parks and Conservation Services. The Patch P Operational Plan is anticipated to be developed in 2018.

Management plans are required to ensure that ecological condition is protected and that management and on-ground activities are effectively implemented.

CORRECTIVE ACTION REQUESTS

CAR 2 – Finalise the operational plan for Patch P to ensure appropriate management is occurring by 31 December 2018.

CAR 3 – Incorporate actions and monitoring requirements into relevant Land Management Agreements for the protection of the ecological condition of MNES within Patches I, L & M by 31 December 2018.

4 ACT Territory and Municipal Services, 2013, *Molonglo Adaptive Management Strategy*, http://www.tams.act.gov.au/__data/assets/pdf_file/0003/588045/Molonglo-Adaptive-Management-Strategy.pdf, p. 32, accessed 28 February 2018

CAR 4: DEVELOP A MANAGEMENT PLAN FOR OTHER AREAS OF PINK-TAILED WORM-LIZARD HIGH AND MODERATE QUALITY HABITAT

COMMITMENT 41

Commitment 41 requires the '*development of a management plan for other areas of high and moderate quality Pink-tailed Worm-lizard habitat that occurs within the Strategic Assessment area and outside the development area.*'

This management plan was required by 7 April 2014. The release of the management plan has been delayed whilst research was undertaken to assess the suitability of various restorative techniques. A draft has been produced and has been submitted to key stakeholders for revision.

This management plan is required to ensure that ecological condition is protected and that management and on-ground activities are effectively implemented.

CORRECTIVE ACTION REQUEST

CAR 4 – Finalise the operational plan for the Pink-tailed Worm-lizard Conservation Area in the Molonglo River Reserve by 30 April 2018.

Approaching Holdens Creek Boardwalk. Source Kirilly Dickson

Audit Table

The results of the audit are found in table-form below.

The *Commitment* and *Timing* were taken directly from the NES Plan and as such, have not been edited.

The *Status update from the 2016–17 Annual Report* column also includes more recent updates provided by EPSDD.

The *Auditor Comments* provide commentary on the reasoning behind the decisions made in the audit analysis, and include any *Observations* or *Corrective Action Requests*.

The *Audit Status* represents the status of the commitment as determined by the auditors, according to the categories listed above. A *Risk Rating* has been assigned to each commitment, based on the *Audit Status* and the *Auditor Comments*.

Finally, the *Commitment Status* identifies whether the commitment has been completed or is ongoing. This will assist in determining the commitments to be audited in the next independent audit.

Box–Gum Woodland in Kama Nature Reserve. Source Kirilly Dickson

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Actions to achieve the conservation outcomes for Box–Gum Woodland.								
Impacts to the Box–Gum Woodland will be limited to a maximum of 110 hectares and a range of measure will be implemented to minimise this area of impact.								
1	Ensure that the combined impacts on Box–Gum Woodland from development within East Molonglo and construction of infrastructure within the river corridor do no exceed 110 hectares.	Throughout and on completion of the final Planning and Design Framework for both stages 2 and 3.	See Section 3.4- Impacts on MNES, Table 3 and Figure 2 show the amount of Box–Gum Woodland that has been impacted to date. In the 2015–16 financial year, Chief Minister, Treasury and the Economic Development Directorate undertook a budget monitoring and mapping project to consolidate all data sets for MNES and development outcomes. This work is being progressed by EPSDD.	• Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012). • Molonglo Valley Stage 3 Interim Limited Area Planning and Design Framework (March 2017). • BGW 2016–17 Figure 2.	The Planning and Design Framework sets the principles for achieving the protection of species and habitat as the Molonglo Valley Stage 2 is developed. The Stage 3 Interim Limited Area Planning and Design Framework sets the proposed principles for the Stage 3 development area early infrastructure works and the land area for construction and operation. Figure 2 of the Annual Report provides a budget summary of the impacted land, stating that 10.96 hectares of Box–Gum Woodland has been impacted. The available balance that has been reported is 89.04 hectares. Please note, this does not add up to 110 hectares (the maximum area of Box–Gum Woodland that can be impacted as per the NES Plan), so the available balance should be 99.04 hectares. EPSDD note that in the 2015–16 financial year, the Chief Minister, Treasury and the Economic Development Directorate undertook a budget monitoring and mapping project to consolidate all data sets for MNES and development outcomes.	Compliant	No risk due to compliance	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
2	Amend the East Molonglo river corridor boundary, in stages 2 and 3 respectively with a view to reducing the impacts to Box–Gum Woodland. This process will ensure that connectivity within the river corridor is maintained.	On completion of the final Planning and Design Framework for stages 2 and 3, respectively.	Stage 2 Planning and Design Framework finalised in 2012. EPSDD is currently preparing a Planning and Design Framework for Stage 3, however, finalising boundaries will not occur until the final Estate Development Plans are approved. Note – An interim limited area Planning and Design Framework for Molonglo Valley Stage 3 was approved in March 2017. This interim area Planning and Design Framework only applies to a small area to the north of Molonglo Stage 3 towards William Hovell Drive to facilitate capital works construction activities.	• Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012). • Molonglo Valley Stage 3 Interim Limited Area Planning and Design Framework (March 2017). • Planning and Development (Technical Amendment – code and clarification amendment) Plan Variation 2012 (No 3), dated 10 August 2012.	EPSDD is currently preparing a Planning and Design Framework for Stage 3, however, finalising boundaries is stated as not occurring until the final Estate Development Plans are approved. The Stage 3 Interim Limited Area Planning and Design Framework sets the proposed principles for the Stage 3 development area early infrastructure works and was approved in March 2017. This interim area Planning and Design Framework only applies to a small area to the north of Molonglo Stage 3 towards William Hovell Drive to facilitate capital works construction activities. It is not clear that these documents together will directly ensure that the East Molonglo River Corridor boundary is preserved with a view to reducing impacts on Box–Gum Woodland, although it is anticipated (resulting in a likelihood rating of Unlikely). It is noted from the site visit that the ACT Parks and Conservation Service have conducted corridor associated research and work that is consistent with the intent of this commitment as to corridor preservation. The Amendment (10 August 2012) has also been instrumented to align delivered infrastructure to routes that mitigate impacts on Pink-tailed Worm-lizards and similar principles are plausibly to be encountered for protection of Box–Gum Woodland. **OBSERVATION: Compliant for Stage 2 and pending for Stage 3. Ensure connectivity within the river corridor is maintained with finalisation of the river corridor boundary in the final Planning and Design Framework for Stage 3. Ensure that maintenance activities of infrastructure do not generate impacts on Box–Gum Woodland.**	Compliant with Observation	Medium Unlikely / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
3	Design the infrastructure that will occur in the river corridor to minimise impacts to Box–Gum Woodland.	Prior to the construction of infrastructure.	Ongoing. Design principles adopted by Economic Development and incorporated in contracts for design and construction projects. The extent of recreational infrastructure proposed in the River Park Concept Plan was reviewed through the draft Plan of Management process. There are two significant refinements which emerged, these include: • where practicably possible, the proposed trunk cycle path will be relocated to within the Inner Asset Protection Zone. This utilizes the lighting corridor of the edge road and minimises fragmentation of the River Park, and • recreation facilities such as parks, access roads, car parking, barbecues and toilets will be centralized to two areas – Catherine Park (Sludge Pits) and Ryans Hill special purpose reserves. Transport Canberra and City Services has completed contracts with specialist ecologists to prepare draft Ecological Management Guidelines for all aspects regarding managing and monitoring MNES at Molonglo inside the three nominated offset areas (Kama Nature Reserve, the Molonglo River Corridor and Patch GG). These guidelines will inform ongoing design and operational works. The Commercial Centre and Environs is currently under a planning review within EPSDD. Economic Development had previously prepared an early draft Urban Edge Master Plan for the Commercial Centre & Environs in Stage 2. This plan will assist the final location of the development boundary, taking into account urban development, environmental values, fire management requirements and edge infrastructure including trunk sewers, urban stormwater management facilities, edge streets and cycle paths, and control of access from vehicles and pedestrians into sensitive habitat. The final location of the River Corridor boundary for the Commercial Centre and environs will be decided when the relevant Estate Development Plan is approved.	• Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012). • Draft Urban Edge Landscape Masterplan and Feasibility Study, September 2014. • Arboretum Woodland Conservation Area Operational Plan, August 2014 to 2017. • Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Drawing 23–15520-L001, dated 22/9/15, Holdens Creek Hill Boardwalk, Works as Executed. • Drawing, dated April 2014, Elevated Boardwalk revised alignment, Holdens Creek Hill Boardwalk. • Drawing C12040–004, dated 27/3/2014, for construction, Molonglo Link Bridge. • Drawing A301 to A308, dated June 2014, BGW walk, Molonglo Package A Works. • Environmental Significant Opinion, Creek Crossings, Molonglo River Reserve, 2 August 2016. • Environmental Significant Opinion, Protective Fencing, 17 April 2013. • Environmental Significant Opinion, Holdens Creek Hill, 23 July 2014.	*The Molonglo River Reserve and Offset Areas, Ecological Management Guidelines* are dated February 2015 but were not signed off until February 2018 due to maps in the document needing to be updated. The guidelines act as a principle document in defining the matters that reflect design and other elements (such as weed control and management aspects) to protect Box–Gum Woodland. They work in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. The operational plans provide guidance for on-ground works and activities to implement key components of the Molonglo Valley Plan, NES Plan and the AMS. Some evidence of implementation was documented and noted during the site visit, but it is not extensively known or explored for full implementation and effectiveness. The respective drawings and site visit notes and photographs provide evidence of implementing construction methods onsite to protect Box–Gum Woodland (and Pink-tailed Worm-lizard) populations. The Environmental Significance Opinion demonstrates planning and methods of construction to mitigate impacts on Box–Gum Woodland (and Pink-tailed Worm-lizard) populations. EPSDD note that an early draft Urban Edge Master Plan for the Commercial Centre & Environs in Stage 2 is being prepared. This will take account of MNES requirements. The final location of the River Corridor boundary for the Commercial Centre and environs will be decided when the relevant Estate Development Plan is approved. EPSDD notes that in preparation for the construction of the remaining parts of John Gorton Drive and the bridge over the Molonglo River, efforts are being made to ensure infrastructure in the river corridor avoids or minimises impacts to MNES as is evidenced by earlier works in Molonglo such as the sewer bridge and other similar projects. Any impacts on MNES will be examined to ensure the already agreed NES Plan "budget" approved by the Commonwealth is not exceeded.	Compliant with Observation	Medium Unlikely / Moderate	Ongoing

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			Both the Molonglo Sewer Pedestrian Bridge (Butters Bridge) and Cravens Creek Pond projects have been designed to minimise impacts on Pink-tailed Worm-lizard habitat, by positioning the infrastructure clear of habitat as much as practicable. For both projects, habitat close to (but not actually impacted) is required to be fenced off and protected as the first item of construction work to be undertaken. For Butters Bridge, an "incrementally launched" structural form was chosen to specifically avoid habitat. This method of construction allows the bridge to be "pushed" over the river and its embankments, from one abutment only, minimising impacts beneath to the piers only. Environmental assessments including ecological surveys to review and update existing ecological impacts have commenced along the remaining section of John Gorton Drive and the bridge crossing over the Molonglo River. The environmental assessments will be finalised into an Impact Assessment Report in 2018, and will provide the basis for ensuring there have been no significant changes to any ecologically sensitive areas.		**OBSERVATION: The Ecological Management Guidelines were not finalised in an appropriate timeframe. There are some documents and site visit evidence to support implementation of key documents and design approaches, and as such impact on-ground can be assessed for areas such as Holdens Creek Boardwalk. Finalising and clearly adopting all key documents and ongoing clear noting of evidence in the planning and delivery of designed infrastructure will assist future compliance status. Ensure that maintenance activities of infrastructure do not generate impacts on Box–Gum Woodland. Due to the demonstration of on-ground activities, the likelihood of risk is noted as Unlikely, however the consequence could be Moderate, giving an overall rating of Medium.**			

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4	Develop, implement and independently monitor Construction Environmental Management Plans (CEMPs) to ensure that unforeseen direct or indirect impacts from construction activities within the development area and the river corridor are avoided. See Section 4.5 for information about the content of CEMPs.	Development of the CEMPs prior to construction. Implementation of the CEMPs during construction.	Ongoing. CEMPs have been prepared for all approved estate developments within the strategic assessment area. EPSDD has incorporated the requirement for CEMPs in all Capital Works infrastructure documentation for Molonglo and has engaged a site surveillance officer to monitor capital works projects in Molonglo. The requirement for CEMPs has been incorporated into all Capital Works documentation for Molonglo River Park, including: • Coombs fire management zone establishment works, • Coombs Pink-tailed Worm-lizard habitat protective fence, • Barrer Hill pine removal stages 1&2, • Box–Gum Park pedestrian walking track, • Coombs riverside shelters and Aprasia habitat boardwalk, • Barrer Hill restoration – vertical habitat structures, • Woodland track signage, • Creek crossings at Holdens Creek Pond outflow and Patch K, • Forb enhancement works within Kama Nature Reserve, and • Coombs boundary fence. To date, approximately 31 CEMPs have been prepared and approved for construction work in Molonglo 1 and 2. This has been done for minor preliminary works such as geotechnical investigations, fencing and utility relocations, as well as all major construction activities such as roadworks, bridges and ponds.	• Contractor Environmental Management Plan, Coombs Residential Estate Stage 1, July 2013, Group One. • Construction Environmental Management Plan, North Coombs. • Environmental Management Plan, Coombs Residential Estate Stage 3, July 2013. • Environmental Management Plan, Cravens Creek Water Quality Control Pond, June 2015. • EPA Approval – CEMP Denman Prospect 1B Stages 2A 2B, dated February 2017. • EPA Approval, CEMP Deep Creek Geotechnical Investigations, dated May 2017. • Construction Environmental Management Plan, Denman Prospect Geotechnical Investigations, NGH environmental, November 2016. • Contractor Environmental Management Plan, Denman Prospect Stage 1A1, dated February 2015. • Construction Environmental Management Plan, East West Arterial Road Stage 2 and Cravens Creek Watermains, Rev 0.4. • Construction Environmental Management Plan, John Gorton Drive Extension Stage 2A, December 2013. • Construction Environmental Management Plan, Asset relocation works John Gorton Drive Stage 1D, July 2012. • Construction Environmental Management Plan, Molonglo 3 Road and Intersection Infrastructure, June 2017. • Construction Environmental Management Plan, Molonglo Boundary fence Construction, May 2017.	This commitment is for CEMPs to be in place and independently monitored to manage and mitigate impacts of development in the river corridor and the development area. This impacts the resourcing required to fully meet this commitment. The requirement to independently monitor CEMPs aims to ensure that contractors are undertaking works in accordance with the CEMP. This involves monitoring of construction activities by an agency/person(s) that are not involved in onsite construction activities. The Environment Protection Authority have advised EPSDD that they are undertaking regular checks of the construction sites within the Molonglo Strategic Assessment area to ensure construction activities are undertaken in accordance with CEMPs. No breaches have been recorded to date. CEMPs (31 in total to date) have been prepared for approved estate developments within the strategic assessment area (Molonglo 1 and 2). EPSDD state they have incorporated the requirement for CEMPs in all capital works infrastructure documentation for Molonglo and have engaged a site surveillance officer to monitor capital works projects in Molonglo. The requirement for CEMPs is noted by ESPDD as being incorporated into all capital works documentation for the Molonglo River Park. A sample review was undertaken as part of this audit. The CEMPs and associated documents show evidence of relating to and acknowledging Pink-tailed Worm-lizard and Box–Gum Woodland protection needs and seek to actively mitigate construction impacts. The ability to monitor and ensure compliance of CEMPs across the entire development area is cumbersome, with much on-ground activity led by developers and builders. This requires ongoing resourcing.	Compliant	No risk due to compliance	Ongoing

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				• Environmental Management Plan, Geotechnical investigation at Coppins Crossing Sewer pump Station and Rising Main, February 2012. • Construction Environmental Management Plan, Molonglo Habitat Restoration Works. • Construction Environmental Management Plan, Pink-tailed Worm-lizard Protective Fence, BGW Pedestrian Trail Package B, Rev 1, dated July 2014. • Construction Environmental Management Plan, Geotechnical investigations, Molonglo Stage 3, January 2016. • Construction Environmental Management Plan, Molonglo 2, October 2012. • Construction Environmental Management Plan, Asset relocation works John Gorton Drive Stage 1D, February 2015. • Construction Environmental Management Plan, Phase 2 ESA, Molonglo Stage 2, August 2012. • Construction Environmental Management Plan, North Coombs. • Construction Environmental Management Plan, North Wright Residential Estate, October 2017. • Construction Environmental Management Plan, North Wright and Coombs Geotechnical Investigations, April 2017. • Construction Environmental Management Plan, Remediation of former sheep dip, December 2014. • Construction Environmental Management Plan, Restoring vertical habitat structures. • Construction Environmental Management Plan, Uriarra Road Intersections and JGD Link Road.				

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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 hectares of Box–Gum Woodland (see **Figure 3**). The three offset sites will be adaptively managed to maintain and enhance the ecological condition of the Box–Gum Woodland that occurs there.								
5	Develop a management plan for the Kama Nature Reserve to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland within the reserve (approximately 117 ha). See Section 4.6 for information about the content of management plans.	Development prior to the commencement of the construction of Sewer 3 East 3 or within 2 years and 6 months of endorsement of the NES Plan; whichever occurs first.	A draft plan was prepared by November 2014 meeting the required timeframe; however review of the fire management approach was required to bring the draft plan into line with the new Strategic Bushfire Management Plan Version 3 which was endorsed in September 2014. A revised draft Molonglo River Reserve Management Plan (including Kama Nature Reserve) will be complete for public consultation in late 2017 or early 2018. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations).	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Your Say site https://yoursay.act.gov.au/	The status of the Molonglo River Reserve Management Plan document is still draft and it is noted that it was released for public consultation on 8 February 2018. Finalisation of the management plan was required by 7 April 2014. This has not occurred due to an apparent delay in finalisation of the Strategic Bushfire Management Plan Version 3. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Box–Gum Woodland within the Kama Nature Reserve, as well as addressing the associated Lower Molonglo River Corridor Nature Reserve and Molonglo River Special Purpose Reserve. It outlines the purpose and principles of the Plan and management of the area in a manner consistent with the protection of MNES. The draft Molonglo River Reserve Management Plan outlines the objectives, policies and actions for the area. Specifically, Appendix 5 lists the actions agreed in the NES Plan and the management plan alignment. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework and future Stage 3 framework when finalised. An operational plan for Kama has been produced and was finalised eight months late in December 2014. The Kama Operational Plan includes all the necessary components of a management plan as outlined in section 4.6, p.37–38 of the NES Plan (and referenced at Appendix 5 of the draft Molonglo River Reserve Management Plan). Achievement of these objectives is to be within the timeframe of the operational plan which is three years. These objectives will be necessarily reviewed in the preparation of a new operational plan for 2018–21. **OBSERVATION: The Molonglo River Reserve Management Plan key document remains in draft state and is currently out for public consultation. The Kama Operational Plan provides for the key actions and requirements of the NES Plan to be in effect whilst the management plan is finalised and endorsed. It is noted that neither document was in place within the required timeframe. Note: p. 21 of the Kama Operational Plan refers to a link for current spatial data but no hyperlink has been provided here. The current spatial data should be provided in the new Kama Operational Plan when developed (2018–21).**	Non-compliant (timeline not met)	Medium Possible / Moderate	Ongoing

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6	Implement the management plan for the Kama Nature Reserve to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland within the reserve.	Commencement on completion of Action 5 Implementation ongoing.	Commencement on completion of Action 5. Implementation ongoing in accordance with Molonglo AMS, Molonglo Ecological Management Guidelines and Kama Operational Plan. EPSDD noted that the operational plan (i.e. management plan) is being implemented and ecological condition is being maintained – see monitoring data. Extensive restoration works have been undertaken in the reserve (including extensive forb enhancement works, tree and shrub plantings, course woody debris placement, habitat rock placement, ecological burns, threatened species translocations and extensive weed control works). Numerous research projects have also been undertaken within the reserve, which aim to improve Box–Gum Woodland and Natural Temperate Grassland management (see research publications and research plans).	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Project Plan, Grassland habitat research – slashing as a biomass management tool for Natural Temperate Grassland and BGW, August 2015. • Johnson 2014 Forb Richness (A14021387). • Project Plan NES rock supplementation (A14423420). • Project Plan Kama Forb Enhancement (A14423526). • Translocation of the striped legless lizard to Kama nature reserve proposal (A14423520). • Molonglo woodland birds baseline surveys report 2014_15 (A14423631). • Superb Parrot Baseline Survey 2014 (A14423632). • Superb Parrot Monitoring Proposal ANU EPSDD 12 July 2017 (A14423640). • Superb Parrot Tech Report 2016 and 2017 (A14423629 and A14423630). • Project Plan, does the chemical control of St Johns Wort provide positive biodiversity outcomes? July 2017. • Smith et al., Annual mowing maintains plant diversity in threatened temperate grasslands, November 2017.	The status of the Molonglo River Reserve Management Plan document is draft and it is noted that it was released for public consultation on 8 February 2018. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Box–Gum Woodland within Kama Nature Reserve. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. The Kama Operational Plan is the document meeting this commitment with specific actions outlined for the maintenance and enhancement of Box–Gum Woodland. Note that the date on the front of this document is December 2014 – 2017, so a new plan will need to be developed to cover implementation for this commitment. The site visit on 21 February confirmed on-ground work undertaken. Confirmation has been provided that work for a selection of contracts was completed on time and as per the requirements of the contract. Monitoring on the bird species in the strategic assessment area has been done in order to establish a baseline. Condition has been maintained since 2013 according to the data provided. As this project is still in early stages of implementation and baselines are currently being set, it is too early to tell if they are achieving the 'enhancement of the ecological condition of Box–Gum Woodland' as per the commitment. A five yearly report will be completed by EPSDD in 2018 to establish baselines to measure any changes against in the future. **OBSERVATION: On-ground management is occurring, however, it is too early to determine if this is achieving the objectives of the commitment in terms of maintenance and enhancement of the condition of Box–Gum Woodland. Ongoing monitoring and sufficient resourcing is necessary in order to meet and determine the status of this commitment in a future audit. This will require research as well as an ongoing updates and meeting of the relevant operational plan for each individual element. The risk of not achieving enhancement of ecological condition is Possible, and the consequence is Moderate due to its plausible extent. Finalisation of the Kama Nature Reserve buffer zone should be considered in the management plan and the new Kama Operational Plan for 2018–21.**	Compliant with Observation	Medium Possible / Moderate	Ongoing

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7	Establish a buffer outside the Kama Nature Reserve between the reserve and the proposed development area, and allow for appropriate uses consistent with nature conservation uses of the reserve. The buffer will be developed to ensure that fire management is undertaken outside of the Kama Nature Reserve and will provide protection against urban edge effects.	As part of the final Planning and Design Framework for Stage 3.	Ongoing. Final Planning and Design Framework for stage 3 is expected to be completed in 2018. EPSDD noted that the determination of the width of the buffer, inside the urban area, will be consistent with the recommendations outlined in the Capital Ecology (2016) Strategy. These recommendations will be documented in the Planning and Design Framework for Molonglo Stage 3, together with any further requirements arising from the determination of the application for an EIS exemption (s.211) for Molonglo Stage 3. The actual determination of the buffer will be undertaken in the future, through detail design associated with the Estate Development Plan development application for the last stage of Whitlam.	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Kama Interface Management Strategy, Capital Ecology, December 2016.	No documents were directly provided to show the determination of a buffer zone to meet this commitment. EPSDD state that this will occur when the Planning and Design Framework for Stage 3 is finalised and this is pending. p. 2 of the Kama Operational Plan states that 'Suburbs are to be developed to the east of the Kama reserve, beyond a buffer, as part of the Molonglo Stage 3 development (within the next 20 years). The buffer zone will be of sufficient width to provide protection against urban edge effects and provide for fire management to avoid adverse environmental impacts on threatened species and communities within Kama.' p. 32 of the draft Molonglo River Reserve Management Plan states that 'In order to minimise both direct and indirect edge effects on Kama, the width [of the buffer] – and its management during development and beyond – must meet the key functional criteria in Table 3.1...The decision about width must be able to clearly demonstrate the evidence for the decision, and a future management regime must also be specified. Opportunities for mitigation of edge effects can also be provided for in Estate Development Plans.' p. 33 Table 3.1 outlines how the buffer must meet functional criteria, however the buffer has not yet been established. p. 140 states 'Any buffer implemented is to be located outside the boundaries of 'Kama' (Block 1419 District of Belconnen).' p. 48–49 of the Kama Interface Management Strategy by Capital Ecology outlines the options for the establishment of the buffer zone. The recommendations provided in this report seem to reasonably meet the intended requirements of this commitment, if implemented. Site interview indicated that the buffer zone is highly transient and there is some concern that the buffer width required to meet this commitment sufficiently will not be applied. **OBSERVATION: It is not clear why the establishment of an indicative buffer zone that meets the requirements of the various documents could not be put into effect, with the final buffer zone specifically marked later. This would provide a higher level of assurance that this commitment will be met.**	Compliant with Observation	High Possible / Major	Ongoing

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					Early evidence provided suggests that this commitment will be controversial in finalising and cannot be determined until completion of the Estate Development Plan as the legal mechanism for securing the buffer. With the numerous documents evidenced to note the consideration of the buffer zone, the encroachment pressure on Kama Nature Reserve, the criticality of the buffer to protect urban edge effects and the lack of clarity as to the commitment of retention, the likelihood is rated as Possible and the impact is plausibly Major.			
8	Develop a Park Concept Plan for the "Molonglo River Park" which will occur along the East Molonglo River Corridor. This Plan will establish management zones within the Park, specifically identifying areas to be designated for conservation as well as identifying recreation areas and resolving public access. A key focus of this plan will be the protection of Box–Gum Woodland.	Development prior to the commencement of construction of John Gorton Drive Stage 2A or within 1 year of endorsement of the NES Plan; whichever occurs first.	Complete. The Molonglo River Corridor Concept Plan prepared by EPSDD was endorsed on 28 August 2012.	• Molonglo River Park Concept Plan, August 2012, endorsed 4 September 2012. • JG Drive Stage 2A Notice of Decision signed.	The Molonglo River Corridor Concept Plan prepared by EPSDD was endorsed on 28 August 2012 which was within the required timeframe. The Concept Plan indicates (across a range of maps and definitions) zones for conservation, recreation and public access, although there is no one simple map that distinguishes this commitment clearly, with public access in particular requiring interpretation of the plan. As noted in the meeting with the Manager of Projects on 10 January 2018, the approach to recreation and protection of the MNES was altered significantly since this plan was developed. Completed with no further action required. Can be removed from future audits unless the significant changes require the development of one document that details all of the requirements.	Compliant	No risk due to compliance	Complete

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9	Develop a management plan for the Molonglo River Park to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland within the park (approximately 73 hectares). See Section 4.6 for information about the content of management plans.	Development prior to the commencement of the construction of the Sewer 3 East or within 2 years and 6 months of endorsement of the NES Plan; whichever occurs first.	An operational plan for Molonglo River Park was completed in June 2014. A draft Molonglo River Reserve Management Plan was prepared by November 2014 meeting the required timeframe; however the review of the fire management approach was required to bring the draft plan into line with the new Strategic Bushfire Management Plan Version 3 which was endorsed in September 2014. This delay was reported to the Australian Government and an extension of time agreed. This timeframe was however exceeded due to time needed to resolve issues relating to the Kama Nature Reserve buffer. The buffer issues have been addressed in the draft plan and work is being undertaken to prepare the document for public consultation in late 2017 or early 2018. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organisations).	• Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • email from Manager of Projects re status of docs, dated 12 January 2018.	The status of the Molonglo River Reserve Management Plan document is draft and it is noted that it was released for public consultation on 8 February 2018. Finalisation of the management plan was required by 7 April 2014. This has not occurred due to an apparent delay in finalisation of the Strategic Bushfire Management Plan Version 3. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Box–Gum Woodland within the Molonglo River Park, as well as addressing the associated Lower Molonglo River Corridor Nature Reserve and Molonglo River Special Purpose Reserve. It outlines the purpose and principles of the plan and management of the area in a manner consistent with the protection of MNES. The management plan outlines the objectives, policies and actions for the area. Specifically, Appendix 5 lists the actions agreed in the NES Plan and the management plan alignment. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework and future Stage 3 framework when finalised. The Molonglo River Reserve Operational Plan has been produced and was finalised four months late in August 2014. It includes all the necessary components of a management plan as outlined in section 4.6, p.37–38 of the NES Plan (and referenced at Appendix 5 of the Draft Molonglo River Reserve Management Plan). Achievement of these objectives is to be within the timeframe of the operational plan which is three years. These objectives will be necessarily reviewed in the preparation of a new operational plan for 2018–21. **OBSERVATION: The Molonglo River Reserve Management Plan key document remains in draft state and is currently out for public consultation. The Molonglo River Reserve Operational Plan provides for the key actions and requirements of the NES Plan to be in effect whilst the management plan is finalised and endorsed. It is noted that neither document was in place within the required timeframe. The risk is rated as having Major consequences as this commitment relates to the 488 hectares of the Molonglo River Park offset area, whereas the Kama Nature Reserve is only 155 hectares. The likelihood is rated as Possible as it has not been met within 5 years.** *Corrective Action Request 1: Provide the final draft Molonglo River Reserve Management Plan to the Minister by 31 July 2018. Any relevant items raised within this audit should be suitably addressed and included in the updated document.*	Non-compliant (timeline not met)	High Possible / Major	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
10	Implement the management plan for the Molonglo River Park to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland within the park.	Commencement on completion of Action 9 Implementation ongoing.	From 2012, EPSDD has undertaken a number of restoration works within the river corridor in line with the operational plans and the draft Molonglo River Reserve Management Plan. EPSDD noted that an operational plan (i.e. management plan) is being implemented and ecological condition is being maintained – see monitoring data. Extensive restoration works have been undertaken in the reserve (including 4 hectares of Pink-tailed Worm-lizard habitat restoration, forb enhancement works, tree and shrub plantings, installation of vertical habitat structures, course woody debris placement, ecological burns, threatened species translocations and extensive weed control works. Numerous research projects have also been undertaken within the reserve, which aim to improve Box–Gum Woodland and Natural Temperate Grassland management (see research publications and research plans). Significant infrastructure has been installed to ensure the protection of MNES and signage has been placed through the reserve to engage and inform the public of the unique environmental values and cultural values present in the reserve.	• Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Barrer scrape site (photo). • 20180129 – email from Ecologist confirming works completed. • Pink-tailed Worm Lizard brick surveys data. • Pink-tailed Worm Lizard low impact monitoring research project 2013. • Signage contract 1. • Signage contract. • Signage contract 2. • Signage contract 3. • Signage contract 4. • 140603 – Project Brief and Contract for Fence Construction. • Coombs boundary fence contract. • MRP Pedestrian Trail contract – HHL. • Molonglo Burn Plan Completed – approved 19 April 2016. • Molonglo EPA Report post burn. • BGW vertical habitat structure installation contract. • Log replacement – executed contract Zamonti. • Short Form. • Barrer Restoration Project Plant supply and planting contract. • signed short form Provincial Barrer Planting. • Structural engineering habitat sculpture contract. • BGW plantings RFQ. • Log Placement contract. • GA invoice. • signed ANBG contract Rutido (Button Wrinklewort).	The status of the Molonglo River Reserve Management Plan document is draft and it is noted that it was released for public consultation on 8 February 2018. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Box–Gum Woodland within the park. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. The Molonglo River Reserve Operational Plan has been produced and was finalised four months late in August 2014. It includes all the necessary components of a management plan as outlined in section 4.6, p.37–38 of the NES Plan (and referenced at Appendix 5 of the Draft Molonglo River Reserve Management Plan). Note that the date on the front of this document is December 2014 – 2017, so a new plan will need to be developed to cover implementation for this commitment. Contracts for work undertaken such as installation of habitat structures, log replacements, planting and fencing Pink-tailed Worm-lizard habitat, installation of signage and translocation of Button Wrinklewort were provided. Confirmation has been provided that work for a selection of contracts was completed on time and as per requirements of the contract. An ecological burn was undertaken in Molonglo on 20–21 April 2016. While the Molonglo River Reserve Management Plan is still in draft, on-ground implementation works are extensive and therefore this commitment is demonstrated as being met. **OBSERVATION: Evidence of on-ground management has been provided, however, it is too early to determine if this is achieving the objectives of the commitment in respect of maintenance and enhancement of Box–Gum Woodland. Ongoing monitoring and sufficient resourcing is necessary in order to monitor and determine the status of this commitment in a future audit. Compliance needs to be retained for each individual element of the operational plan. The risk of not achieving enhancement of ecological condition is Possible and the consequence is Major as the commitment relates to the 488 hectares of the Molonglo River Park offset area whereas the Kama Nature Reserve is only 155 hectares.**	Compliant with Observation	High Possible / Major	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
				• Threatened Species Translocation Plan – Rutidosis. • Pink-tailed Worm-lizard habitat restoration Stage 1. • Pink-tailed Worm-lizard habitat restoration Stage 2 – patch K. • Pink-tailed Worm-lizard habitat restoration Stage 3 – patch K. • Pink-tailed Worm-lizard habitat restoration Stage 4 – Coombs. • Pink-tailed Worm-lizard habitat extension. • Update for cons council newsletter with photos.				
11	Establish Patch GG as an offset site by incorporating the area into the National Arboretum.	Established within 6 months of endorsement of the NES Plan.	Complete. On 22 January 2013 the ACT Government purchased 'Glenloch' from its former long term lessees. In 2014 Patch GG was transferred for incorporation into the National Arboretum to enable management as an offset site.	• Schedule of Asset Transfer dated 10 February 2014.	The Schedule of Asset Transfer notes the transfer of custodianship and managerial responsibilities from the Land Development Agency to Territory and Municipal Services for Glenloch Patch GG. This asset transfer should have been finalised by 7 April 2012. On 22 January 2013 the ACT Government purchased 'Glenloch' from its former long term lessees. The date of transfer from the Land Development Agency was 10 February 2014, almost 2 years late.	Non-compliant (timeline not met)	Low Possible / Insignificant	Complete
12	Develop a management plan for Patch GG to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland within the park (approximately 44 hectares). See Section 4.6 for information about the content of management plans.	Development prior to the commencement of the construction of the Sewer 3 East or within 2 years and 6 months of endorsement of the NES Plan; whichever occurs first.	Complete. Patch GG has been incorporated into the National Arboretum. An operational plan for Patch GG was completed in June 2014. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations).	• Arboretum Woodland Conservation Area Operational Plan, August 2014 to 2017.	EPSDD noted that the title of 'management plan' was changed to 'operational plan'. An operational plan for Patch GG as part of the Arboretum has been produced. This was finalised four months late in August 2014. This operational plan includes all the necessary components of a management plan as outlined in section 5.4, p.37–38 of the NES Plan. Timeframes for the achievement of these objectives are for the life of the operational plan which is three years. These objectives will be reviewed in the preparation of a new operational plan. **OBSERVATION: The Arboretum Woodland Conservation Area Operational Plan was prepared four months late.**	Non-compliant (timeline not met)	Medium Unlikely / Minor	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
13	Implement the management plan for Patch GG to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland.	Commencement on completion of Action 12 Implementation ongoing.	Management is being undertaken in line with the operational plan. Restoration planting was undertaken in 2016. EPSDD noted that the operational plan (i.e. management plan) is being implemented and ecological condition is being maintained – see monitoring data. Extensive restoration works have been undertaken in the reserve (including tree and shrub plantings, course woody debris placement, fencing and extensive weed control works).	• Arboretum Woodland Conservation Area Operational Plan, August 2014 to 2017. • Revegetation within remnant Grassy Box Woodland (Patches GG and N) located on the northern boundary of the International Arboretum, Canberra, dated 15 March 2015 (proposal), Greening Australia. • Revegetation within remnant Grassy Box Woodland (Patches GG and N) located on the northern boundary of the International Arboretum, Canberra, Stage 2, dated 23 March 2015 (proposal), Greening Australia.	The operational plans provide guidance for on-ground works and activities to implement key components of the NES Plan and the AMS. Evidence has been provided to demonstrate on-ground implementation has occurred in Patch GG and the Greening Australia restoration proposals have been undertaken. Confirmation of this was demonstrated through the provision of approved and paid invoices for this work. **OBSERVATION: On-ground management is occurring, however, it is too early to determine if this is achieving the objectives of the commitment for maintenance and enhancement of Box–Gum Woodland. Ongoing monitoring and sufficient resourcing is necessary in order to determine the status of this commitment in a future audit.**	Compliant with Observation	Medium Unlikely / Minor	Ongoing
Adaptively manage 28 hectares of Box–Gum Woodland within the strategic assessment area to maintain and enhance its ecological condition. This will be made up of patches C, H and N (see **Figure 2**).								
14	Develop management plans for Box–Gum Woodland patches C, H, and N (see Figure 3) to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland within these areas. See Section 4.6 for information about the content of management plans.	Development prior to the completion of the final Planning and Design Framework for Stage 3.	Operational plans for Patches C & H will be developed by EPSDD in 2017–18. An operational plan for Patch N was developed in 2014, as part of the Arboretum Woodland Conservation Area but has not been implemented. The land is under the custodianship of the Land Development Agency who are managing the area for weed control, pest management and bushfire fuel load monitoring. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations). Patches C and H were previously under a Land Management Agreement and have now been handed over to Parks Conservation Service, who will develop the management plans. The development of the management plans for C and H is due prior to completion of the final Planning and Design Framework for stage 3.	• Arboretum Woodland Conservation Area Operational Plan, August 2014 to 2017. • email from Infrastructure Officer re Patches C and H in Molonglo SA dated 24 January 2018. • 2016 05 03 – land withdrawal – signed.	The finalisation of the Planning and Design Framework for Molonglo Stage 3 has not yet occurred so this commitment is compliant for timing requirements. No management plan has been produced, however, an operational plan for Patch GG and N as part of the Arboretum (finalised August 2014) has been produced and this includes all the necessary components of a management plan as outlined in section 5.4, p.37–38 of the NES Plan. Patches C and H were not included in this plan so it is assumed they are not covered by a management plan or a Land Management Agreement as they were in rural leases until recently. The patches are now owned by CMTEDD (as of July 2016) and are being managed by Parks and Conservation Service who is undertaking weed control, pest management and bushfire fuel load monitoring. **OBSERVATION: Evidence of implementation has been provided, however no operational plan has been prepared for Patches C and H. It would seem appropriate for a draft operational plan for Patches C and H to be in effect ready for implementation as Stage 3 is to be imminently endorsed (EPSDD stated it is expected to be completed by March 2018).**	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
15	Implement management plans for Box–Gum Woodland patches C, H, and N (see Figure 3) to provide for the maintenance and enhancement of the ecological condition of Box–Gum Woodland within these areas.	Commence on completion of Action 14 Implementation ongoing.	See above. The timeframe for this action is to commence on completion of action 14. The development of the management plans for C and H (as required by 14) is due prior to completion of the final Planning Design Framework for Stage 3. The Planning and Design Framework for Stage 3 is not yet completed. Please note management actions have commenced in patches C and H, including fire management and weed control. There is a grazing license over the patches, and the blocks are grazed as required for fire fuel reduction and weed reduction. Contractors were engaged to assist with woody weed control. The weed management will be rolled out as a staged approach so bird habitat remains available while the invasive weeds break down and natives are established. The first native plantings are being planned for this in autumn 2018. Patch N is part of the Arboretum Woodland Conservation Area Operational Plan.	• Arboretum Woodland Conservation Area Operational Plan, August 2014 to 2017. • email from Infrastructure Office 24 January 2018.	The finalisation of the Planning and Design Framework for Molonglo Stage 3 has not yet occurred so this commitment is compliant regarding timing requirements. No management plan has been produced, however, an operational plan for Patch GG and N as part of the Arboretum (finalised August 2014) has been produced and this includes all the necessary components of a management plan as outlined in section 5.4, p.37–38 of the NES Plan. Patches C and H were not included in this plan so it is assumed they are not covered by a management plan or a Land Management Agreement as they were in rural leases until recently. The patches are now owned by Chief Minister, Treasury and Economic Development Directorate (as of July 2016) and being managed by Parks and Conservation Service who is undertaking weed control, pest management and bushfire fuel load monitoring. **OBSERVATION: Evidence of on-ground management has been provided, however it is too early to determine if this is achieving the objectives of the commitment with respect to maintenance and enhancement of Box–Gum Woodland. Ongoing monitoring and sufficient resourcing is required in order to determine the status of the commitment in a future audit.**	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Adaptively manage 45.4 hectares of Box–Gum Woodland within the strategic assessment area to maintain its ecological condition. This will be made up of patches I, L, M and P (see **Figure 2**).								
16	Develop management plans for Box–Gum Woodland patches I, L, M and P (see Figure 3 of the NES Plan) to provide for the maintenance of the ecological condition of Box–Gum Woodland within these areas.	Development after completion of the adaptive management strategy (see Section 7) and within 2 years and 6 months of endorsement of the NES Plan.	Patches I, L and M are managed under a rural lease with a Land Management Agreement. An operational plan for Patch P will be developed by EPSDD in 2017–18. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations). Monitoring results indicate that ecological condition has been maintained.	• email from Manager of Projects, 9 January 2018.	This commitment should have been finalised by 7 April 2014, therefore at the time of the audit it is almost four years late. EPSDD advised that Patches I, L and M are managed under a rural lease with a Land Management Agreement and that an operational plan for Patch P will be developed by EPSDD in 2017- 18. This plan was delayed to allow the completion of a fire management strategy for the western boundary of Denman Prospect urban development. EPSDD notes that weed control and condition monitoring has been undertaken in these patches. **OBSERVATION: The areas under lease are deemed as being required to meet the commitments of the NES Plan and the EPBC Act. As such, evidence of transfer of responsibility and that management and implementation is effective on-ground is required. It would seem appropriate for a draft operational plan to be in effect ready for implementation for Patch P. The likelihood is rated as Likely as the commitment is four years overdue and the consequence of this is Moderate.** *Corrective Action Request 2: Finalise the operational plan for Patch P to ensure appropriate management is occurring by 31 December 2018.* *Corrective Action Request 3: Incorporate actions and monitoring requirements into relevant Land Management Agreements for the protection of the ecological condition of MNES within Patches I, L & M by 31 December 2018.*	Non-compliant	High Likely / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
17	Undertake fuel hazard management in patches I, L, M and P (see Figure 3) with the management and protection of Box–Gum Woodland as a critical consideration (within the constraints of ensuring the safety of the urban population).	On Completion of Action 16.	As above. The Bushfire Risk Strategy undertaken by the Land Development Agency has Emergency Services and the Fire Management Unit of Transport Canberra and City Services support and will set the management requirements both within and immediately outside the future urban development boundary in Denman Prospect taking into account Box–Gum Woodland.	• Bushfire Operations Plan 2016/17, Environment and Planning Directorate. • Bushfire Operations Plan 2015/16, Environment and Planning Directorate.	Documents provided demonstrate that management and protection of Box–Gum Woodland has been taken into consideration in the development of plans related to fuel hazard management in the Molonglo Valley Strategic Assessment area. In relation to Commitment 18, EPSDD commented that "No fuel management has been undertaken in Box–Gum Woodland patches I, L, M and P." This commitment is reliant on completion of Commitment 16 which has not yet occurred so it is not possible to determine the status of this commitment at this time.	Undetermined	Undetermined	Ongoing
18	Annually monitor the condition of the Box–Gum Woodland patches I, L, M, P (total area of 45.4 hectares) on the western boundary of East Molonglo to ensure that fuel hazard management is not negatively impacting on the Box–Gum Woodland values.	On Completion of Action 16.	A Monitoring Procedures Manual for Molonglo was prepared by EPSDD in 2013 in accordance with the AMS. EPSDD has undertaken annual vegetation monitoring since 2013, in accordance with the monitoring procedures manual.	• Molonglo River Reserve Procedures Manual, Monitoring vegetation and habitat condition, September 2014. • Molonglo vegetation condition monitoring data, xls file (A14422992). • Monitoring data Figure for Patches I, L, M and P – word file, dated 3 January 2018.	Documents provided demonstrate that management and protection of Box–Gum Woodland has been taken into consideration in the development of plans related to fuel hazard management in the Molonglo Valley Strategic Assessment area. In relation to Commitment 18, EPSDD commented that "No fuel management has been undertaken in Box–Gum Woodland patches I, L, M and P. " This commitment is reliant on completion of Commitment 16 which has not yet occurred so it is not possible to determine the status of this commitment at this time.	Undetermined	Undetermined	Ongoing

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19	Should the monitoring in Action 18 show that: • for a period of two consecutive years; • more than 30 per cent of the combined area of patches I, L, M, P (total area of 45.4 hectares) no longer meets the EPBC Act listing criteria for Box–Gum Woodland; then the ACT Government will establish an offset site within two years of those monitoring results that meets the following criteria: • the offset will be in the Molonglo Valley; and • the offset will include a minimum of 90.8 hectares of EPBC Act listed Box–Gum Woodland.	If required.	EPSDD completed annual vegetation monitoring for the fourth consecutive year in 2016. Vegetation condition monitoring results show that the ecological condition of patches I, L, M and P has been maintained.	• Molonglo River Reserve Procedures Manual, Monitoring vegetation and habitat condition, September 2014. • Molonglo vegetation condition monitoring data, xls file (A14422992). • Monitoring data Figure for Patches I, L, M and P. • word file, dated 3 January 2018.	Documents provided demonstrate that management and protection of Box–Gum Woodland has been taken into consideration in the development of plans related to fuel hazard management in the Molonglo Valley Strategic Assessment area. In relation to Commitment 18, EPSDD commented that "No fuel management has been undertaken in Box–Gum Woodland patches I, L, M and P. " This commitment is reliant on completion of Commitment 16 which has not yet occurred so it is not possible to determine the status of this commitment at this time.	Undetermined	Undetermined	Ongoing
20	Should an offset site be required under Action 19, then the offsite site will be established as a Nature Reserve and managed consistently with the other offset sites (Kama Nature Reserve, Molonglo River Park, Patch GG).	If required.	Not currently required.		Documents provided demonstrate that management and protection of Box–Gum Woodland has been taken into consideration in the development of plans related to fuel hazard management in the Molonglo Valley Strategic Assessment area. In relation to Commitment 18, EPSDD commented that "No fuel management has been undertaken in Box–Gum Woodland patches I, L, M and P. " This commitment is reliant on completion of Commitment 16 which has not yet occurred so it is not possible to determine the status of this commitment at this time.	Undetermined	Undetermined	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Maintenance and enhancement of the Box–Gum Woodland that occurs within the West Molonglo component of the strategic assessment area (see **Figure 2**).								
21	Manage the Box–Gum Woodland that occurs in West Molonglo in accordance with the terms of a Land Management Agreement (LMA). LMAs are required by Part 9.7 of the Planning and Development Act 2007 for all non-urban leases. The LMA covering the Box–Gum Woodland in West Molonglo contains a Land Action Plan which ensures that: • the ecological functioning and integrity of Box–Gum Woodland on the lease is retained and improved; • the extent and character of the Box–Gum Woodland is preserved; and • there is an Action Plan which details the activities, timeframes and performance measures put in place to ensure the conservation outcomes are met.	Ongoing.	Not required. See Commitment 22 below.	• SA02 endorsed letter of acknowledgement Commitment 21 and 22.	Letter from the Commonwealth (8 December 2016) notes that the Box–Gum Woodland areas set aside in West Molonglo are obsolete and no further action needs to be taken. Refer to Commitment 22 for more information.	Compliant	No risk due to compliance	Complete

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22	West Molonglo is zoned broadacre and is not part of the ACT Government's current land release program. In the event that West Molonglo is developed in the future for broadacre uses or residential development then, subject to confirmatory ecological assessment of Box–Gum Woodland, the area of EPBC Act Box–Gum Woodland that occurs there will be set aside as a Nature Reserve.	If required the Nature Reserve will be established prior to construction in West Molonglo commencing.	Complete. Box–Gum Woodland in West Molonglo was set aside as nature reserve through Territory Plan Variation 351 approved on 23 October 2015. The area of Box–Gum Woodland originally mapped for the strategic assessment was refined through an ecological assessment undertaken by David Hogg Pty Ltd in 2013. The current reserve boundaries were set based on the later ecological assessment.	• Plan Variation 351 Commencement Notice 2016 (cn2016–14). • Plan Variation 351 Notifiable Instrument NI2015–610. • SA02 endorsed letter of acknowledgement Commitment 21 and 22.	Letter from the Commonwealth (8 December 2016) notes that the Box–Gum Woodland areas set aside in West Molonglo are obsolete and no further action needs to be taken. EPSDD note that the Box–Gum Woodland in West Molonglo was set aside as nature reserve through Territory Plan Variation 351 approved on 23 October 2015. This variation commenced on 22 July 2016. The area of Box–Gum Woodland originally mapped for the strategic assessment was refined through an ecological assessment undertaken by David Hogg Pty Ltd in 2013. The current reserve boundaries were set based on the later ecological assessment.	Compliant	No risk due to compliance	Complete

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Improving and applying the knowledge about the management of Box–Gum Woodland								
23	Establish and manage an off-site restoration project, as an indirect offset, for Box–Gum Woodland. See Section 4.7 for information about the off-site restoration project.	Before development commences in Stage 2.	Complete. The use of Barrer Park which is on site was supported by the Commonwealth as meeting this commitment. EPSDD started BGW restoration work in 2014. A total of 15,607 plants, 1,505 trees and shrubs and 14,102 groundcovers were planted. EPSDD completed Stage 3 of the Box–Gum Woodland restoration in 2016–17. As part of Stage 3, ten vertical habitat structures, 400 course woody debris logs and 80 tonnes of surface rock was placed into the restoration area to provide habitat for threatened and non-threatened Box–Gum Woodland species. The vertical habitat structures project is an innovative restoration initiative currently being trialed in the Molonglo River Reserve. The project installed a total of ten habitat structures, including 5 utility poles and 5 relocated mature trees, enriched with carved hollows and artificial bark providing habitat for invertebrate, bird, bat and marsupial species. In collaboration with ANU researchers at the Fenner School of Environment and Society, this study will shed light on the effectiveness of this restoration method for biodiversity in modified landscapes.	• NES Action 23 Box–Gum Woodland Restoration Project, Barrer Restoration project, Barrer Hill Molonglo River Park (A12081732). • Planning and Development (Conditional Environmental Significance Opinion – Block 71, Molonglo – vertical habitat restoration) Notice 2016 (No 1), Notifiable Instrument NI2016–124, dated 10 March 2016. • Agreement between ACT and ANU and Joyce Hwang for the purposes of funding of a research project on the subject of "Designing and constructing a habitat sculpture". • Services Agreement, ACT National Parks Australian National Botanic Gardens, dated 16 May 2016 (to establish seed orchard). • Agreement between the ACT and ANU for the funding of an Honours project – restoring vertical habitat structures as a biodiversity offset tactic. • Letter from Australian Government Dept of Environment to Economic Development Directorate advising that Commitment 23 is met via the Barrer Hill project, dated 5 February 2015. • Smith et al., Annual mowing maintains plant diversity in threatened temperate grasslands. • Project Plan, Grassland habitat research – slashing as a biomass management tool for Natural Temperate Grassland and Box–Gum Woodland, August 2015. • Threatened species translocation plan, Button Wrinklewort (A14423425). • Sato et al., The complexities of managing grasslands for biodiversity: relationships between different measures of vegetation structure and plant diversity, dated 14 September 2017. • McDougall et al, Restoration rocks: integrating abiotic and biotic habitat restoration to conserve threatened species and reduce fuel load.	EPSDD note that the use of Barrer Park is supported by the Commonwealth as meeting this commitment. EPSDD started Box–Gum Woodland restoration work in 2014. A total of 15,607 plants, 1,505 trees and shrubs and 14,102 groundcovers have been planted. EPSDD completed Stage 3 of the Box–Gum Woodland restoration in 2016–17. The vertical habitat structures project is an innovative restoration initiative currently being trialed in the Molonglo River Reserve. Early results noted during the site visit suggests a tenfold increase in fauna species associated with the vertical habitats. Native ground cover restoration trials have also occurred including topsoil scalping and direct seeding, tubestock planting and comparisons of guarded versus unguarded plantings. A translocation of the Button Wrinklewort (listed as Endangered under EPBC Act) has been undertaken. In collaboration with ANU researchers at the Fenner School of Environment and Society, this Honours project sheds light on the effectiveness of this restoration method for biodiversity in modified landscapes. The agreement with the Australian National Botanic Gardens for the Small Purple Pea seed orchard provides locally sourced seed stock. The Barrer Hill area is the basis for a range of research into biodiversity enhancing elements – such as the Smith *et al* paper regarding annual mowing and the project associated with slashing as a biomass management tool, the paper by Sato et al. regarding managing grasslands and McDougall et al regarding the role of restoration rocks. The site visit noted the visual positive impact of the trial vertical habitats and native species planting in the scraped zones and tree guard zones. The first construction undertaken in Stage 2 was John Gorton Drive 2a which runs between Denman Prospect and the Molonglo Group Centre which commenced in September 2012 (email from Manager, Land Supply and Policy). The Restoration Plan for the Box–Gum Woodland Project was completed in March 2013. **OBSERVATION: The Restoration Plan for the Box–Gum Woodland Project was established six months late in March 2013 and Box–Gum Woodland restoration work started in 2014. The intent of the commitment is observed to be met with the current on ground activities and as such the consequence is rated as Moderate. The survival rate of plants in restoration works should continue to be monitored for effectiveness. Ongoing resourcing and funding is required for compliance in future.**	Non-compliant (timeline not met)	Medium Rare / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Actions to achieve conservation outcomes for Natural Temperate Grassland.								
No direct or indirect impacts to Natural Temperate Grassland.								
24	Protection of the Natural Temperate Grassland within the Kama Nature Reserve.	Ongoing.	In 2014–15, EPSDD undertook Ecological Surveys of Natural Temperate Grassland. EPSDD is preparing a Plant Field Guide for the Molonglo Valley Conservation Area to promote the ecological values of the reserve, thereby assist residents in the Molonglo Valley to protect the reserve. EPSDD is undertaking the following research: • Grassland habitat research – slashing as a biomass management tool for Natural Temperate Grassland and Box–Gum Woodland – research project, and • Natural Temperate Grassland ecosystem recovery through habitat rock supplementation. In 2016–17, EPSDD commenced a forb enhancement program in Kama Nature Reserve to enhance forb diversity, increase ecological condition and habitat values of Natural Temperate Grassland and Box–Gum Woodland within Kama Nature Reserve and to implement and test Box–Gum Woodland understorey enhancement recommendations informed by research undertaken by the ANU Fenner School. In 2016–17, EPSDD also conducted an ecological burn within the Kama Nature Reserve. The burn was undertaken as part of a larger grassland restoration research project, which aims to improve the ecological condition of Natural Temperate Grassland. Please note there has been no decrease in the values from 2013–2016. The monitoring data for Patches A1 and A2 show no significant change in site value score from 2013 to 2017, however there has been a significant increase in the floristic value score from 2013 to 2017.	• Project Plan, Grassland habitat research – slashing as a biomass management tool for Natural Temperate Grassland and BGW, August 2015. • Johnson 2014 Forb Richness (A14021387). • Project Plan Field Guide of Plants of Molonglo (A14407039). • Project Plan NES rock supplementation (A14423420). • Project Plan Kama Forb Enhancement (A14423526). • Translocation of the striped legless lizard to Kama nature reserve proposal (A14423520). • All sites summary.xls. including 2013 to 2017 data.	EPSDD note that in 2014–15, EPSDD undertook Ecological Surveys of Natural Temperate Grassland. It is observed that the data is not yet of sufficient quantum to enable powerful statistical determinations to be made. EPSDD is also currently preparing a *Plant Field Guide for the Molonglo Valley Conservation Area* to promote the ecological values of the reserve and thereby assist residents in the Molonglo Valley to protect the reserve (draft viewed during site visit and noted to be extensive and detailed). EPSDD has or is also undertaking the following research: • annual mowing maintains plant diversity in threatened temperate grasslands (Smith et al. 2018), • Restoration rocks: integrating abiotic and biotic habitat restoration to conserve threatened species and reduce fire fuel loads (McDougall et al. 2016), • The complexities of managing grasslands for biodiversity; the influence of vegetation structure on plant diversity (Sato In prep), • How does fire and fire season effect plant diversity and abundance? (Smith et al. In prep), • How does the addition of surface rock influence reptile diversity and abundance? (Palmer et al. In prep), and • Does the chemical control of St John's wort provide positive biodiversity outcomes? (Milner In prep). In 2016–17, EPSDD commenced a forb enhancement program in Kama Nature Reserve to enhance forb diversity, increase ecological condition and habitat values of Natural Temperate Grassland and Box–Gum Woodland within Kama Nature Reserve and to implement and test Box–Gum Woodland understorey enhancement recommendations informed by research undertaken by the ANU Fenner School.	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
					In 2016–17, EPSDD also conducted an ecological burn within the Kama Nature Reserve. The burn was undertaken as part of a larger grassland restoration research project, which aims to improve the ecological condition of Natural Temperate Grassland. At the site visit on 21 February 2018, the translocation of Striped Legless Lizards to Kama and their ongoing monitoring for establishment was noted. The ecologist provided monitoring data for the Natural Temperate Grassland in Kama Nature Reserve. This data demonstrates that the overall vegetation condition has been maintained and the floristic value has improved. Per cent cover of annual exotic species was greater in 2017 compared to 2013 which may be due to prior seasonal rain impacts. **OBSERVATION: Monitoring and activities to date indicate strong commitment to protection of the habitat. This will need to continue and be adequately resourced to ensure consequences are negligible and that protection can be demonstrated. Ongoing monitoring data is also required to improve statistical definition of outcomes.**			

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Adaptive management of the Natural Temperate Grassland that occurs within the Kama Nature Reserve to maintain and enhance its ecological condition.								
25	Develop a management plan for the Kama Nature Reserve to provide for the maintenance and enhancement of the ecological condition of Natural Temperate Grassland within the reserve. See Section 4.6 for information about the content of management plans.	Development prior to the commencement of the construction of the Sewer 3 East or within 2 years and 6 months of endorsement of the NES Plan; whichever occurs first.	Please see response to commitment 5. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations).	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Project Plan, Grassland habitat research – slashing as a biomass management tool for Natural Temperate Grassland and BGW, August 2015. • Project Plan NES rock supplementation (A14423420). • Project Plan Kama Forb Enhancement (A14423526).	The status of the Molonglo River Reserve Management Plan document is draft and it is noted that it was released for public consultation on 8 February 2018. Finalisation of the management plan was required by 7 April 2014. This has not occurred due to an apparent related delay in finalisation of the Strategic Bushfire Management Plan Version 3. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Natural Temperate Grassland within the Kama Nature Reserve, as well as addressing the associated Lower Molonglo River Corridor Nature Reserve and Molonglo River Special Purpose Reserve. It outlines the purpose and principles of the plan and management of the area in a manner consistent with the protection of MNES. The draft Molonglo River Reserve Management Plan outlines the objectives, policies and actions for the area. Specifically, Appendix 5 lists the actions agreed in the NES Plan and the management plan alignment. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework and future Stage 3 Framework when finalised. An operational plan for Kama has been produced and was finalised eight months late in December 2014. It includes all the necessary components of a management plan as outlined in section 4.6, p.37–38 of the NES Plan (and referenced at Appendix 5 of the draft Molonglo River Reserve Management Plan). Achievement of these objectives is to be within the timeframe of the operational plan which is three years. These objectives will be reviewed in the preparation of a new operational plan for 2018–21. Ecological burning has also been undertaken in Kama Nature Reserve which aims to improve the ecological condition of the Natural Temperate Grassland. **OBSERVATION: The Molonglo River Reserve Management Plan key document remains in draft state and is currently out for public consultation. The Kama Operational Plan provides for the key actions and requirements of the NES Plan to be in effect whilst the Molonglo River Reserve Management Plan is finalised and endorsed. It is noted that neither document was in place within the required timeframe. Note: p. 21 of the Kama Operational Plan refers to a link for current spatial data but no hyperlink has been provided here. The current spatial data should be provided in the new Kama Operational Plan when it is developed (2018–21).**	Non-compliant (timeline not met)	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
26	Implement the management plan for the Kama Nature Reserve to provide for the maintenance and enhancement of the ecological condition of Natural Temperate Grassland within the reserve.	Commencement on completion of Action 25 Implementation ongoing.	Please see response to commitment 6. The operational plan (i.e. management plan) is being implemented and ecological condition is being maintained – see monitoring data. Extensive restoration works have been undertaken in the reserve (including extensive forb enhancement works, tree and shrub plantings, course woody debris placement, habitat rock placement, ecological burns, threatened species translocations and extensive weed control works). Numerous research projects have also been undertaken within the reserve, which aim to improve Box–Gum Woodland and Natural Temperate Grassland management (see research publications and research plans).	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Project Plan, Grassland habitat research – slashing as a biomass management tool for Natural Temperate Grassland and BGW, August 2015. • Johnson 2014 Forb Richness (A14021387).	The status of the Molonglo River Reserve Management Plan document is draft and it is noted that it was released for public consultation on 8 February 2018. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Natural Temperate Grassland within Kama Nature Reserve. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. The Kama Operational Plan is the document meeting this commitment with specific actions outlined for the maintenance and enhancement of the Natural Temperate Grassland. The site visit on 21 February confirmed on-ground work undertaken. Note that the date on the front of this document is December 2014 – 2017, so a new plan will need to be developed to cover implementation for this commitment. As this project is still in early stages of implementation and baselines are currently being set, it is too early to tell if they are achieving the 'maintenance and enhancement of the ecological condition of Natural Temperate Grassland' as per the commitment. A five yearly report will be completed by EPSDD in 2018 to establish baselines to measure any changes against in the future. **OBSERVATION: On-ground management is occurring, however, it is too early to determine if this is achieving the objectives of the commitment in respect of maintenance and enhancement of Natural Temperate Grassland. Ongoing monitoring and sufficient resourcing is necessary in order to determine the status of this commitment in a future audit. The risk of not achieving enhancement of ecological condition is Possible and the consequence is Moderate due to its plausible extent.**	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
27	Establish a buffer outside the Kama Nature Reserve between the reserve and the proposed development area, and allow for appropriate uses consistent with nature conservation uses of the reserve. The buffer will be developed to ensure that fire management is undertaken outside of the Kama Nature Reserve and will provide protection against urban edge effects.	As part of the final Planning and Design Framework for Stage 3.	Please see response to commitment 7. EPSDD noted that the determination of the width of the buffer, inside the urban area, will be consistent with the recommendations outlined in the Capital Ecology (2016) Strategy. These recommendations will be documented in the Planning and Design Framework for Molonglo Stage 3, together with any further requirements arising from the determination of the application for an EIS exemption (s.211) for Molonglo Stage 3. The actual determination of the buffer will be undertaken in the future, through detail design associated with the Estate Development Plan development application for the last stage of Whitlam.	• Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012). • Molonglo Valley Stage 3 Interim Limited Area Planning and Design Framework (March 2017). • Kama Interface Management Strategy, Capital Ecology, December 2016.	No documents were directly provided to show the determination of a buffer zone to meet this commitment. EPSDD state that this will occur when the Planning and Design Framework for Stage 3 is finalised and this is pending. p. 2 of the Kama Operational Plan states that 'Suburbs are to be developed to the east of the Kama reserve, beyond a buffer, as part of the Molonglo Stage 3 development (within the next 20 years). The buffer zone will be of sufficient width to provide protection against urban edge effects and provide for fire management to avoid adverse environmental impacts on threatened species and communities within Kama.' p. 32 of the draft Molonglo River Reserve Management Plan states that 'In order to minimise both direct and indirect edge effects on Kama, the width [of the buffer] – and its management during development and beyond – must meet the key functional criteria in Table 3.1...The decision about width must be able to clearly demonstrate the evidence for the decision, and a future management regime must also be specified. Opportunities for mitigation of edge effects can also be provided for in Estate Development Plans.' p. 33 Table 3.1 outlines how the buffer must meet functional criteria, however the buffer has not yet been established. p. 140 states 'Any buffer implemented is to be located outside the boundaries of 'Kama' (Block 1419 District of Belconnen).' p. 48–49 of the Kama Interface Management Strategy by Capital Ecology outlines the options for the establishment of the buffer zone. The recommendations provided in this report seem to reasonably meet the intended requirements of this commitment, if implemented. Site interview indicated that the buffer zone is highly transient and there is some concern that the buffer width required to meet this commitment sufficiently will not be applied.	Compliant with Observation	High Possible / Major	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
					OBSERVATION: It is not clear why the establishment of an indicative buffer zone that meets the requirements of the various documents could not be put into effect, with the final buffer zone specifically marked later. This would provide a higher level of assurance that this commitment will be met. **Early evidence provided suggests that this commitment will be controversial in finalising and cannot be determined until completion of the Estate Development Plan as the legal mechanism for securing the buffer. With the numerous documents evidenced to note the consideration of the buffer zone, the encroachment pressure on Kama Nature Reserve, the criticality of the buffer to protect urban edge effects and the lack of clarity as to the commitment of retention, the likelihood is rated as Possible and the impact is plausibly Major.**			
Actions to achieve conservation outcomes for Pink-tailed Worm-lizard								
Impacts to high and moderate quality Pink-tailed Worm-lizard habitat will be limited to a maximum of 27 hectares and a range of measures will be implemented to minimise this area of impact.								
28	Ensure that the combined impacts on high and moderate quality Pink-tailed Worm-lizard habitat from development within East Molonglo and construction of infrastructure within the river corridor do not exceed 27 hectares.	On completion of the final Planning and Design Framework stages 2 and 3 respectively.	Planning and Design Framework Stage 2 complete. Planning and Design Framework for stage 3 is currently under preparation. Final boundaries will be confirmed once Estate Development Plans are approved.	• Molonglo Pink-tailed Worm-lizard, High and Moderate Quality Habitat (date unknown). • Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012). • Molonglo Valley Stage 3 Interim Limited Area Planning and Design Framework (March 2017).	EPSDD note that the Planning and Design Framework for Stage 2 is complete and that the Planning and Design Framework for Stage 3 is currently under preparation. Final boundaries will be confirmed once Estate Development Plans are approved and as such the total hectares to be impacted are not known. However, a map of Pink-tailed Worm-lizard high and moderate quality habitat and associated table indicates a total of 10.06 hectares as removed or at risk for the period 2013 (not confirmed date period). Furthermore, as per the 2016–17 Annual Report, 0.55 hectares of Pink-tailed Worm-lizard habitat has been removed so far. It is anticipated that the Planning and Design Framework for Stage 3 will be cognisant of the 27 hectare total budget and that this will not be exceeded, although this audit cannot confirm compliance will be met in future. Compliant for Stage 2 and pending for Stage 3.	Compliant	No risk due to compliance.	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
29	Amend the East Molonglo river corridor boundary in Stages 2 and 3 respectively with a view to reducing impacts to high and moderate quality Pink-tailed Worm-lizard habitat. This process will ensure that connectivity within the river corridor is maintained.	On completion of the final Planning and Design Framework stages 2 and 3 respectively.	Planning and Design Framework Stage 2 complete. The East Molonglo River Corridor was amended accordingly. Planning and Design Framework for Stage 3 is currently under preparation. Final boundaries will be confirmed once Estate Development Plans are approved.	• Molonglo Pink-tailed Worm-lizard, High and Moderate Quality Habitat (date unknown). • Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012). • Molonglo Valley Stage 3 Interim Limited Area Planning and Design Framework (March 2017).	EPSDD note that the Planning and Design Framework for Stage 2 is complete and that the Planning and Design Framework for Stage 3 is currently under preparation. Final boundaries will be confirmed once Estate Development Plans are approved and as such the total hectares impacted are not known. However, the map of Pink-tailed Worm-lizard high and moderate quality habitat and associated table indicates a total of 10.06 hectares as removed or at risk for the period 2013 (not confirmed date period). As per 2016–17 Annual Report, 0.55 hectares of Pink-tailed Worm-lizard habitat has been removed so far. It is anticipated that the Planning and Design Framework for Stage 3 will not exceed the 27 hectare total budget and ensure connectivity is maintained, although this audit cannot confirm compliance will be met in future.	Compliant	No risk due to compliance	Ongoing
30	Design the infrastructure that will occur in the river corridor to minimise impacts to high and moderate quality Pink-tailed Worm-lizard habitat.	Prior to the construction of infrastructure.	Ongoing. Please see response to commitment 3.	• Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Park Concept Plan, August 2012, endorsed 4 September 2012. • JG Drive Stage 2A Notice of Decision signed. • Drawing 23–15520-L001, dated 22/9/15, Holdens Creek Hill Boardwalk, Works as Executed. • Drawing, dated April 2014, Elevated Boardwalk revised alignment, Holdens Creek Hill Boardwalk. • Drawing C12040–004, dated 27/3/2014, for construction, Molonglo Link Bridge. • Drawing A301 to A308, dated June 2014, BGW walk, Molonglo Package A Works. • Pink-tailed Worm-lizard Sewer Pedestrian, For construction, Cravens Creek WQCP, Drawing 110049-C–1006, dated 29/5/2014.	A number of drawings and matters for construction seem to meet the intent of this commitment to design infrastructure to protect Pink-tailed Worm-lizard, such as the Holdens Creek Boardwalk and other elements. The site visit of Holdens Creek Boardwalk confirms the design and delivered construction elements to protect habitat and species including avoiding rock zones and enabling light to penetrate the gridded boardwalk. In addition, only 0.55 hectares of high and moderate quality Pink-tailed Worm-lizard habitat was reported in the *Molonglo Valley Strategic Assessment Annual Report 2016–17* as being impacted by 30 June 2017 in the entire strategic assessment area. *The Molonglo River Reserve and Offset Areas, Ecological Management Guidelines* are dated February 2015 but were not signed off until February 2018 due to maps in the document needing to be updated. The guidelines act as a principle document in defining the matters that reflect design and other elements (such as weed control and management aspects) to protect Pink-tailed Worm-lizards. They work in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework.	Compliant with Observation	Medium Unlikely / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
					The operational plans provide guidance for on-ground works and activities to implement key components of the NES Plan and the AMS. Some evidence of implementation was documented and noted during the site visit, but it is not extensively known or explored for full implementation effect. The respective drawings and site visit notes and photographs provide evidence of implementing construction methods onsite to protect Pink-tailed Worm-lizard populations. The Environmental Significance Opinion demonstrates planning and methods of construction to mitigate impacts on Pink-tailed Worm-lizard populations. EPSDD note that an early draft *Urban Edge Master Plan for the Commercial Centre & Environs in Stage 2* is being prepared. This will take account of MNES requirements. The final location of the Molonglo River Corridor boundary for the commercial centre and environs will be decided when the relevant Estate Development Plan is approved. **OBSERVATION: The Ecological Management Guidelines were not finalised in an appropriate timeframe. There are some documents and site visit evidence to support implementation of key documents and design approaches, and as such impact on-ground can be assessed for areas such as Holdens Creek Boardwalk. Finalising and clearly adopting all key documents and ongoing clear noting of evidence in the planning and delivery of designed infrastructure will assist future compliance status. Due to the demonstration of on-ground activities the likelihood of risk is noted as Unlikely, however the consequence could be Moderate, giving an overall rating of Medium.**			

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
31	Develop, implement and independently monitor Construction Environmental Management Plans (CEMPs) to ensure that unforeseen direct or indirect impacts from construction activities within the development area and the river corridor are avoided. See Section 4.5 for information about the content of CEMPs.	Development of the CEMPs prior to construction Implementation of the CEMPs during construction.	Ongoing. Please see response to commitment 4.		This commitment is for CEMPs to be in place and independently monitored to manage and mitigate impacts of development in the river corridor and the development area. This impacts the resourcing required to fully meet this commitment. The requirement to independently monitor CEMPs aims to ensure that contractors are undertaking works in accordance with the CEMP. This involves monitoring of construction activities by an agency/person(s) that are not involved in onsite construction activities. The Environment Protection Authority have advised EPSDD that they are undertaking regular checks of the construction sites within the Molonglo Valley Strategic Assessment area to ensure construction activities are undertaken in accordance with CEMPs. No breaches have been recorded to date. CEMPs (31 in total to date) have been prepared for approved estate developments within the strategic assessment area (Molonglo 1 and 2). EPSDD state they have incorporated the requirement for CEMPs in all capital works infrastructure documentation for Molonglo and have engaged a site surveillance officer to monitor capital works projects in Molonglo. The requirement for CEMPs is noted by ESPDD as being incorporated into all capital works documentation for the Molonglo River Park. A sample review was undertaken as part of this audit. The CEMPs and associated documents show evidence of relating to and acknowledging Pink-tailed Worm-lizard and Box–Gum Woodland protection needs and seek to actively mitigate construction impacts. The ability to monitor and ensure compliance of CEMPs across the entire development area is cumbersome, with much on-ground activity led by developers and builders. This requires ongoing resourcing.	Compliant	No risk due to compliance	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Two offset sites will be established within the strategic assessment area (Kama Nature Reserve and the Molonglo River Park) that will provide for the long term protection of 66 hectares of high and moderate quality Pink-tailed Worm-lizard habitat (see **Figure 3**). These areas will be adaptively managed to maintain and enhance the ecological condition of the Pink-tailed Worm-lizard habitat that occurs there.								
32	Develop a management plan for the Kama Nature Reserve to provide for the maintenance and enhancement of the ecological condition of all Pink-tailed Worm-lizard habitat within the reserve (approximately 6 hectares which includes 3.33 hectares of high and moderate quality habitat). See Section 4.6 for information about the content of management plans.	Development prior to the commencement of the construction of the Sewer 3 East or within 2 years and 6 months of endorsement of the NES Plan; whichever occurs first.	Please see response to commitment 5. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations).	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Molonglo Pink-tailed Worm-lizard, High and Moderate Quality Habitat (date unknown).	The status of the Molonglo River Reserve Management Plan document is still draft and it is noted that it was released for public consultation on 8 February 2018. Finalisation of the management plan was required by 7 April 2014. This has not occurred due to an apparent delay in finalisation of the Strategic Bushfire Management Plan Version 3. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Pink-tailed Worm-lizard habitat within the Kama Nature Reserve, as well as addressing the associated Lower Molonglo River Corridor Nature Reserve and Molonglo River Special Purpose Reserve. It outlines the purpose and principles of the plan and management of the area in a manner consistent with the protection of MNES. The draft Molonglo River Reserve Management Plan outlines the objectives, policies and actions for the areas. Specifically, Appendix 5 lists the actions agreed in the NES Plan and the management plan alignment. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework and future Stage 3 framework when finalised. An operational plan for Kama has been produced and was finalised eight months late in December 2014. The Kama Operational Plan includes all the necessary components of a management plan as outlined in section 4.6, p.37–38 of the NES Plan (and referenced at Appendix 5 of the draft Molonglo River Reserve Management Plan). Achievement of these objectives is to be within the timeframe of the operational plan which is three years. These objectives will be reviewed in the preparation of a new operational plan for 2018–21. **OBSERVATION: The Molonglo River Reserve Management Plan key document remains in draft state and is currently out for public consultation. The Kama Operational Plan provides for the key actions and requirements of the NES Plan to be in effect whilst the management plan is finalised and endorsed. It is noted that neither document was in place within the required timeframe. Note: p. 21 of the Kama Operational Plan refers to a link for current spatial data but no hyperlink has been provided here. The current spatial data should be provided in the new Kama Operational Plan when developed (2018–21).**	Non-compliant (timeline not met)	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
33	Implement the management plan for the Kama Nature Reserve to provide for the maintenance and enhancement of the ecological condition of all Pink-tailed Worm-lizard habitat within the reserve.	Commencement on completion of Action 32 Implementation ongoing.	Please see response to commitment 6. The operational plan (i.e. management plan) is being implemented and ecological condition is being maintained – see monitoring data. Extensive restoration works have been undertaken in the reserve (including extensive forb enhancement works, tree and shrub plantings, course woody debris placement, habitat rock placement, ecological burns, threatened species translocations and extensive weed control works). Numerous research projects have also been undertaken within the reserve, which aim to improve Box–Gum Woodland and Natural Temperate Grassland management (see research publications and research plans).	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Molonglo Pink-tailed Worm Lizard, High and Moderate Quality Habitat (date unknown).	The status of the Molonglo River Reserve Management Plan document is draft and it is noted that it was released for public consultation on 8 February 2018. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Pink-tailed Worm-lizard habitat within the Kama Nature Reserve. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. The Kama Operational Plan is the document meeting this commitment with specific actions outlined for the maintenance and enhancement of Pink-tailed Worm-lizard habitat. Note that the date on the front of this document is December 2014 – 2017, so a new plan will need to be developed to cover implementation for this commitment. The site visit on 21 February confirmed on-ground work undertaken. Confirmation has been provided that work for a selection of contracts was completed on time and as per requirements of the contract. Condition has been maintained since 2013 according to the data provided. As this project is still in early stages of implementation and baselines are currently being set, it is too early to tell if 'enhancement of the ecological condition of Pink-tailed Worm-lizard habitat' as per the commitment is being achieved. A five yearly report will be completed by EPSDD in 2018 to establish baselines to measure any changes against in the future. **OBSERVATION: On-ground management is occurring, however, it is too early to determine if this is achieving the objectives of the commitment for maintenance and enhancement of Pink-tailed Worm-lizard populations. Ongoing monitoring and sufficient resourcing is necessary in order to assess and determine the status of this commitment in a future audit. The risk of not achieving enhancement of ecological condition is Possible and the consequence is Moderate due to its plausible extent.**	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
34	Establish a buffer outside the Kama Nature Reserve between the reserve and the proposed development area, and allow for appropriate uses consistent with nature conservation uses of the reserve. The buffer will be developed to ensure that fire management is undertaken outside of the Kama Nature Reserve and will provide protection against urban edge effects.	As part of the final Planning and Design Framework for Stage 3.	Please see response to commitment 7. The determination of the width of the buffer, inside the urban area, will be consistent with the recommendations outlined in the Capital Ecology (2016) Strategy. These recommendations will be documented in the Planning and Design Framework for Molonglo Stage 3, together with any further requirements arising from the determination of the application for an EIS exemption (s.211) for Molonglo Stage 3. The actual determination of the buffer will be undertaken in the future, through detail design associated with the Estate Development Plan development application for the last stage of Whitlam.	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • ACT Strategic Bushfire Management Plan, 2014 to 2019.	No documents were directly provided to show the determination of a buffer zone to meet this commitment. EPSDD state that this will occur when the Planning and Design Framework for Stage 3 is finalised and this is pending. p. 2 of the Kama Operational Plan states that 'Suburbs are to be developed to the east of the Kama reserve, beyond a buffer, as part of the Molonglo Stage 3 development (within the next 20 years). The buffer zone will be of sufficient width to provide protection against urban edge effects and provide for fire management to avoid adverse environmental impacts on threatened species and communities within Kama.' p. 32 of the draft Molonglo River Reserve Management Plan states that 'In order to minimise both direct and indirect edge effects on Kama, the width [of the buffer] – and its management during development and beyond – must meet the key functional criteria in Table 3.1...The decision about width must be able to clearly demonstrate the evidence for the decision, and a future management regime must also be specified. Opportunities for mitigation of edge effects can also be provided for in Estate Development Plans.' p. 33 Table 3.1 outlines how the buffer must meet functional criteria, however the buffer has not yet been established. p. 140 states 'Any buffer implemented is to be located outside the boundaries of 'Kama' (Block 1419 District of Belconnen).' p. 48–49 of the Kama Interface Management Strategy by Capital Ecology outlines the options for the establishment of the buffer zone. The recommendations provided in this report seem to reasonably meet the intended requirements of this commitment, if implemented. Site interview indicated that the buffer zone is highly transient and there is some concern that the buffer width required to meet this commitment sufficiently will not be applied.	Compliant with Observation	High Possible / Major	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
					OBSERVATION: It is not clear why the establishment of an indicative buffer zone that meets the requirements of the various documents could not be put into effect, with the final buffer zone specifically marked later. This would provide a higher level of assurance that this commitment will be met. **Early evidence provided suggests that this commitment will be controversial in finalising and cannot be determined until completion of the Estate Development Plan as the legal mechanism for securing the buffer. With the numerous documents evidenced to note the consideration of the buffer zone, the encroachment pressure on Kama Nature Reserve, the criticality of the buffer to protect urban edge effects and the lack of clarity as to the commitment of retention, the likelihood is rated as Possible and the impact is plausibly Major.**			
35	Develop a Park Concept Plan for the "Molonglo River Park" which will occur along the East Molonglo River corridor. This Plan will establish management zones within the Park, specifically identifying areas to be designated for conservation as well as identifying recreation areas and resolving public access. A key focus of this will plan will be the protection of high and moderate quality Pink-tailed Worm-lizard habitat.	Development prior to the commencement of construction of John Gorton Drive Stage 2A or within 1 year of endorsement of the NES Plan; whichever occurs first.	Complete. The Molonglo River Corridor Concept Plan prepared by EPSDD was endorsed on 28 August 2012.	• Molonglo River Park Concept Plan, August 2012, endorsed 4 September 2012. • JG Drive Stage 2A Notice of Decision signed.	The Molonglo River Corridor Concept Plan prepared by EPSDD was endorsed on 28 August 2012 which was within the required timeframe. The Concept Plan indicates (across a range of maps and definitions) zones for conservation, recreation and public access, although there is no one simple map that distinguishes this commitment clearly, with public access in particular requiring interpretation of the plan. As noted in the meeting with the Manager of Projects on 10 January 2018, the approach to recreation and protection of the MNES was altered significantly since this plan was developed.	Compliant	No risk due to compliance	Complete

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
36	Develop a management plan for the Molonglo River Park to provide for the maintenance and enhancement of the ecological condition of high and moderate quality Pink-tailed Worm-lizard habitat within the park (approximately 62 hectares). See Section 4.6 for information about the content of management plans.	Development prior to the commencement of the construction of the Sewer 3 East or within 2 years and 6 months of endorsement of the NES Plan; whichever occurs first.	Please see response to commitment 9. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations). In addition please note this commitment relates to the development of the plan, the observation about evidence of the implementation of the plan are more relevant to Action 38 for which there should be extensive examples. For example, infrastructure installed to protect MNES, restoration works, research and threatened species translocations.	• Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017.	The status of the Molonglo River Reserve Management Plan document is draft and it was released for public consultation on 8 February 2018. Finalisation of the management plan was required by 7 April 2014. This has not occurred due to an apparent related delay in finalisation of the Strategic Bushfire Management Plan Version 3. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Pink-tailed Worm-lizard habitat within the Molonglo River Park, as well as addressing the associated Lower Molonglo River Corridor Nature Reserve and Molonglo River Special Purpose Reserve. It outlines the purpose and principles of the plan and management of the area in a manner consistent with the protection of MNES. The management plan outlines the objectives, policies and actions for the area. Specifically, Appendix 5 lists the actions agreed in the NES Plan and the management plan alignment. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework and future Stage 3 framework when finalised. The Molonglo River Reserve Operational Plan was finalised four months late in August 2014. It includes all the necessary components of a management plan as outlined in section 4.6, p.37–38 of the NES Plan (and referenced at Appendix 5 of the Draft Molonglo River Reserve Management Plan). Achievement of these objectives is to be within the timeframe of the operational plan which is three years. These objectives will be reviewed in the preparation of a new operational plan for 2018–21. **OBSERVATION: The Molonglo River Reserve Management Plan key document remains in draft state and is currently out for public consultation. The Molonglo River Reserve Operational Plan provides for the key actions and requirements of the NES Plan to be in effect whilst the management plan is finalised and endorsed. It is noted that neither document was in place within the required timeframe. The risk is rated as having Major consequences as this commitment relates to the 488 hectares of the Molonglo River Park offset area, whereas the Kama Nature Reserve is only 155 hectares. The likelihood is rated as Possible has it has not been met within 5 years.** *Corrective Action Request 1: Provide the final draft Molonglo River Reserve Management Plan to the Minister by 31 July 2018. Any relevant items raised within this audit should be suitably addressed and included in the updated document.*	Non-compliant (timeline not met)	High Possible / Major	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
37	Establish a 20 metre buffer around high and moderate quality Pink-tailed Worm-lizard habitat (other than, for example the areas to be impacted by the bridge crossings and strategically placed walking tracks) within the East Molonglo River corridor. Manage these areas to ensure the maintenance of their conservation value. Management measures (as outlined in Section 3) will be incorporated into the management plan for the river corridor.	On completion of the final Planning and Design Framework for Stage 2 and completion of the Park Concept Plan.	Buffer zones were identified in the Park Concept Plan. Management measures are incorporated into the Molonglo River Reserve Draft Reserve Management Plan due for public release in 2017. All Operational Plans identify Pink-tailed Worm-lizard 20 metre buffers within the ecological values map and text. The Molonglo Valley environmental and cultural values Collector app also identifies Pink-tailed Worm-lizard 20 metre buffer and allows users in the field to accurately identify the location of the buffers. Pink-tailed Worm-lizard habitat restoration works have focused on 20 metre buffer areas. Pink-tailed Worm-lizard habitat protective fences have been installed around the majority of Pink-tailed Worm-lizard habitat buffers in all areas adjacent to development.	• Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Molonglo River Park Concept Plan August 2012. • NES Plan advice 230312. • 20180124 – email from Ecologist re details of app used.	Timing requirement for this commitment is on completion of the final Planning and Design Framework for Stage 2 and completion of the Park Concept Plan. Both of these documents were completed approximately five years ago (Sept 2012 and August 2012 respectively). The 20 metre buffer was first identified in the Molonglo River Park Concept Plan (page 37) and then in the ecological values maps in the operational plans. It is noted that the quality of the map in the Park Concept Plan and in the Molonglo River Reserve Operational Plan (page 31) is not adequate to allow detailed analysis of the areas. In addition, an app used by the ecologist of the area was provided. This is the Molonglo Valley environmental and cultural values Collector app. The ecologist stated that the app provides your location in reference to all known and recorded environmental and cultural values in the Molonglo Valley (including MNES, rare plant records, Rainbow Bee-eater nest sites, scar trees, restoration sites and numerous other values). It is an incredibly useful planning tool to use in the field to protect or enhance environmental and cultural values. **OBSERVATION: The buffer zones were included in the Molonglo River Park Concept Plan and the Molonglo River Reserve Operational Plan, however the map in the operational plan was different. Evidence of management measures in the draft Molonglo River Reserve Management Plan is limited. The site evidence of deployment of the app showing the buffer zones defines the frequency as Unlikely, however the consequence is rated plausibly Moderate due to the spatial extent.**	Compliant with Observation	Medium Unlikely / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
38	Implement the management plan for the Molonglo River Park to provide for the maintenance and enhancement of the ecological condition of high and moderate quality Pink-tailed Worm-lizard habitat within the park.	Commencement on completion of Action 36 Implementation ongoing.	Operational plans are being implemented. Extensive Pink-tailed Worm-lizard habitat restoration and research works have been undertaken and the success of these projects is well established. For example, a research project was completed in collaboration with the ANU Fenner School on the establishment of a Pink-tailed Worm Lizard habitat restoration technique (see McDougall et al. published manuscript). These research findings have since guided four hectares of Pink-tailed Worm-lizard habitat restoration throughout the reserve and the results of the majority of these restoration programs is known. Restoration works undertaken in 2014, 15 and 16 have all been colonized by Pink-tailed Worm-lizards. Further to this – two genetically distinct populations of Pink-tailed Worm-lizard fragmented by an almost one kilometre wide barrier to dispersal (former pine plantation) have nearly been reconnected through the establishment of 11 habitat islands. Since 2014 – two to four habitat islands have been colonized per year and now 10 of the 11 habitat islands have been colonized. We are also developing a low-impact monitoring method for Pink-tailed Worm-lizards (NES Action 43; Section 4.8). The Draft National Recovery Plan (Brown *In prep*) for the Pink-tailed Worm-lizard notes that monitoring the species by the standard survey method of searching beneath stones is problematic because it results in considerable disturbance when the stones are moved. As monitoring requires repeated visits to a site, and hence repeated turning of stones, the plan recommends that the technique of rock turning should only be used once at a site unless effective alternative low impact techniques are identified or if impacts can be mitigated. The research project aims to test the effectiveness of artificial shelter surveys as a low impact monitoring method for Pink-tailed Worm-lizards.	• Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Project Plan, Pink-tailed Worm Lizard habitat restoration (NES Patch K_ = Stage 3 (2015/16). And Stage 4 Coombs (2016/17). • McDougall et.al., Restoration rocks: integrating abiotic and biotic habitat restoration to conserve threatened species and reduce fuel load. • Canberra South District, District Works Plan for the stockpiling of rock for Pink-tailed Worm Lizard habitat rehabilitation / habitat connectivity (A14423886). • Project Plan, Molonglo River Reserve, Pink-tailed Worm Lizard low impact monitoring research project (A14423883). • Project Plan, Patch K OAPZ Pink-tailed Worm Lizard habitat restoration (A14423887). • Pink-tailed Worm Lizard habitat extension 2017 – map.	The status of the Molonglo River Reserve Management Plan document is still in draft and it is noted that it was released for public comment on 8 February 2018. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Pink-tailed Worm-lizard habitat within the park. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. Contracts for work undertaken such as installation of habitat structures, log placements, planting and fencing and Pink-tailed Worm-lizard habitat restoration, installation of signage and translocation of Button Wrinklewort were provided. An ecological burn was undertaken in Molonglo on 20–21 April 2016. While the Molonglo River Reserve Management Plan is still in draft, on-ground implementation works are extensive and therefore this commitment is demonstrated as being met. **OBSERVATION: On-ground management is occurring and the restoration of Pink-tailed Worm-lizard habitat has been successful in enhancing the condition of these areas as demonstrated through the Pink-tailed Worm-lizard habitat colonisation that has occurred since 2014. Ongoing monitoring and sufficient resourcing is necessary in order to assess and determine the status of this commitment in a future audit. The risk of not achieving enhancement of ecological condition is Possible and is rated as having Major consequences as this commitment relates to the 488 hectares of the Molonglo River Park offset area, whereas the Kama Nature Reserve is only 155 hectares.**	Compliant with Observation	High Possible / Major	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
39	Register a disallowable instrument under the Domestic Animals Act 2000 to effect a cat containment policy for the Molonglo area.	30 June 2012.	Complete. DI–2015–58.	• Domestic Animals (Cat Containment) Declaration 2015 (No 2), disallowable instrument DI20175- 58, dated 16 April 2015. • Domestic Animals (Cat Containment) Declaration 2017 (No 1), disallowable instrument DI2017 – 199, dated 1 August 2017. • email from Manager of Land Supply and Policy. – DI 2011–246.	The original disallowable instrument was signed on 16 August 2011, including Wright and Coombs. This met the required deadline of 30 June 2012. The suburbs declared on the latest disallowable instrument match up to those for which development has commenced (refer to email from Manager of Land Supply and Policy). It should be noted that the process to alert the appropriate staff member to declare the disallowable instrument for a new cat containment area should be established.	Compliant	No risk due to compliance	Ongoing
Continued protection of 28.1 hectares of high and moderate quality Pink-tailed Worm-lizard habitat within the Lower Molonglo Nature Reserve (see Figure 4 of the NES Plan). These areas will be adaptively managed to maintain the ecological condition of the Pink-tailed Worm-lizard habitat that occurs there.								
40	Continued implementation of the Plan of Management for the Lower Molonglo Nature Reserve to provide for the maintenance of the ecological condition of the high and moderate quality Pink-tailed Worm-lizard habitat that occurs there (approximately 28.1 hectares).	Ongoing.	The following management actions have been undertaken in the Lower Molonglo Nature Reserve: • Ongoing strategic ecological cattle grazing to reduce exotic grass biomass and reduce fire risk from surrounding fuel loads, • Targeted African Lovegrass (Eragrostis Curvula) and Blackberry (Rubus Fruticosus) control over half the habitat, • Targeted control of pigs in surrounding landscape which resulted in 15 individuals being removed and associated reduction in ground disturbance, and • Ongoing strategic grazing and weed control requirements on properties with Pink-tailed Worm-lizard habitat that are managed under the Land Management Agreement process.	• Action Plan Pink-tailed Worm-lizard, 2017. • Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017.	The status of the Molonglo River Reserve Management Plan document is still in draft and it is noted that it was released for public comment on 8 February 2018. The draft does act as a principle document in defining the matters that reflect elements to protect, maintain and enhance Pink-tailed Worm-lizard habitat within the park. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. Contracts for work undertaken such as installation of habitat structures, log replacements, planting and fencing Pink-tailed Worm-lizard habitat, installation of signage and translocation of Button Wrinklewort were provided. An ecological burn was undertaken in Molonglo on 20–21 April 2016. While the Molonglo River Reserve Management Plan is still in draft, on-ground implementation works are extensive and therefore this commitment is generally being met. **OBSERVATION: On-ground management is occurring and the restoration of Pink-tailed Worm-lizard habitat has been successful in enhancing the condition of these areas as demonstrated through the Pink-tailed Worm-lizard habitat colonisation that has occurred since 2014. Ongoing monitoring and sufficient resourcing is necessary in order to assess and determine the status of this commitment in a future audit.**	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
			Extensive Pink-tailed Worm-lizard habitat restoration and research works have been undertaken and the success of these projects is well established. For example, a research project was completed in collaboration with the ANU Fenner School on the establishment of a Pink-tailed Worm-lizard habitat restoration technique (see McDougall et al. published manuscript). These research findings have since guided four hectares of Pink-tailed Worm-lizard habitat restoration throughout the reserve and the results of the majority of these restoration programs is known. Restoration works undertaken in 2014, 15 and 16 have all been colonized by Pink-tailed Worm-lizards. Further to this – two genetically distinct populations of Pink-tailed Worm-lizard fragmented by an almost one kilometre wide barrier to dispersal (former pine plantation) have nearly been reconnected through the establishment of 11 habitat islands. Since 2014 – two to four habitat islands have been colonized per year and now 10 of the 11 habitat islands have been colonized. We are also developing a low-impact monitoring method for Pink-tailed Worm-lizards (NES Action 43; Section 4.8). The Draft National Recovery Plan (Brown in prep) for the Pink-tailed Worm-lizard notes that monitoring the species by the standard survey method of searching beneath stones is problematic because it results in considerable disturbance when the stones are moved. As monitoring requires repeated visits to a site, and hence repeated turning of stones, the plan recommends that the technique of rock turning should only be used once at a site unless effective alternative low impact techniques are identified or if impacts can be mitigated. The research project aims to test the effectiveness of artificial shelter surveys as a low impact monitoring method for Pink-tailed Worm-lizards.					

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Protection of an additional 23.3 hectares of high and moderate quality Pink-tailed Worm-lizard habitat within the strategic assessment area outside of the development and offset areas (see Figure 4 of the NES Plan). These areas will be adaptively managed to maintain and enhance the ecological condition of the Pink-tailed Worm-lizard habitat that occurs there.								
41	Develop management plans for the other areas of high and moderate quality Pink-tailed Worm-lizard habitat that occurs within the strategic assessment area and outside of the development and offset areas (approximately 23.3 hectares) to provide for the maintenance and enhancement of the ecological condition of the Pink-tailed Worm-lizard habitat within these areas. See Section 4.6 for information about the content of management plans.	Development after completion of the adaptive management strategy (see Section 7) and within 2 years and 6 months of endorsement of the NES Plan.	An operational plan for the area of Pink-tailed Worm-lizard habitat to be protected under Action 40 as identified at Figure 3A of the AMS 2013, will be prepared in 2017–18. EPSDD noted that the title of 'Management Plans' was changed to 'Operational Plan' to avoid confusion with the title of the statutory plan of management being changed to management plan. Information within the operational plans includes all necessary components of a management plan as per page 36 of the NES plan. While specific timeframes are not given for each action, the timeframe for all actions is three years (i.e. within the lifespan of the operational plan) or ongoing (e.g. maintain links with existing and potential research organizations). Lower Molonglo River Reserve Plan of Management isstill active until superseded by the Molonglo River Reserve Management Plan. Please see – http://www.legislation.act.gov.au/di/2001–298/20010927–704/pdf/2001–298.pdf.	• Action Plan Pink-tailed Worm-lizard, 2017. • http://www.legislation.act.gov.au/di/2001–298/20010927–704/pdf/2001–298.pdf. • Molonglo River Reserve (PTWL Conservation Area) Operational Plan August 2018–2021. • Action 41 – Management Plan for PTWL habitat – email from Ecologist	The draft Molonglo River Reserve (PTWL Conservation Area) Operational Plan was produced in February 2018. It is currently out for review by key stakeholders. Note that the total area of Pink-tailed Worm-lizard habitat that this plan covers is 27.5 hectares. This plan has been delayed to allow suitability of experimental restoration techniques to be tested and results gained over several years. This management plan should have been developed by 7 April 2014. It is four years overdue and important to ensure protection across the strategic assessment area. While EPSDD notes that the Lower Molonglo River Reserve Plan of Management is still active until the new Molonglo River Reserve Plan of Management is finalised, the Lower Molonglo River Reserve Plan of Management only applies to part of the river corridor in the Molonglo Valley Strategic Assessment area and it came into effect in 2001 which is well before the agreement for the Molonglo Valley Strategic Assessment. **OBSERVATION: The operational plan has not been developed in a reasonable timeframe leading to the frequency rating of Likely with a consequence of Moderate due to the spatial impact plausible.** *Corrective Action Request 4: Finalise the operational plan for the Pink-tailed Worm-lizard Conservation Area in the Molonglo River Reserve by 30 April 2018.*	Non-compliant (timeline not met)	High Likely / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
42	Implement management plans for the other areas of high and moderate quality Pink-tailed Worm-lizard habitat that occurs within the strategic assessment area and outside of the development and offset areas (approximately 23.3 hectares) to provide for the maintenance and enhancement of the ecological condition of the Pink-tailed Worm-lizard habitat within these areas.	Commencement on completion of Action 41. Implementation ongoing.	Pink-tailed Worm-lizard habitat restoration Stage 4 commenced in 2016–17 at the Coombs peninsula tip to ensure the ecological condition of Pink-tailed Worm-lizard habitat is enhanced and connectively improved and to ensure that fire management standards are reached.	• Action Plan Pink-tailed Worm-lizard, 2017. • Project Plan, Pink Tailed Worm-lizard habitat restoration (Coombs) – Stage 4 (2016/17). • Molonglo River Reserve (PTWL Conservation Area) Operational Plan August 2018–2021. • Action 41 – Management Plan for PTWL habitat – email from Ecologist.	The draft Molonglo River Reserve (PTWL Conservation Area) Operational Plan was produced in February 2018. It is currently out for review by key stakeholders. Note that the total area of Pink-tailed Worm-lizard habitat that this plan covers is 27.5 hectares. Finalisation of this management plan is overdue and important to ensure protection across the strategic assessment area. Evidence was provided that demonstrated habitat extension works have been undertaken that aim to reconnect habitat within the Pink-tailed Worm-lizard Conservation Area to habitat to the east on the other side of the former Blewitts pine plantation. The Pink-tailed Worm-lizard low-impact monitoring research project is partly being undertaken within the Pink-tailed Worm-lizard Conservation Area (i.e. one of the three sites is within this area). Monitoring and habitat restoration has been occurring since 2014. EPSDD also note that evidence of weed control works undertaken in Pink-tailed Worm-lizard habitat within the strategic assessment area and outside of the development and offset area can be found at the following link: http://www.environment.act.gov.au/parks-conservation/plants-and-animals/Biosecurity/invasive-plants#control. No other restoration works are required at this site given the extent and condition of the habitat. **OBSERVATION: While on-ground management is being undertaken, the operational plan has not been developed in a reasonable timeframe leading to the frequency rating of Possible with a consequence of Moderate due to the spatial impact plausible.**	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Improving and applying the knowledge about the management of Pink-tailed Worm-lizard.								
43	Undertake a research project examining the effects on Pink-tailed Worm-lizard of disturbance and proximity to urban areas. See Section 4.8 for information about the Pink-tailed Worm-lizard research project.	Commencement within 6 months of endorsement and incorporated into the Planning and Design Frameworks for both Satages 2 and 3.	Stage 1a (Mt Taylor habitat disturbance case study) – complete. Stage 1b – ongoing. The Pink-tailed Worm-lizard low-impact monitoring research project commenced in 2014 and will continue until 2020. Early results are promising with the low-impact monitoring method achieving a similar number of detections as traditional methods of surveying the species (i.e. rock rolling). Stage 2a (population monitoring) – ongoing. Population monitoring and habitat condition monitoring is being undertaken as part of Stage 1b and the Molonglo vegetation condition monitoring program. Stage 2b (Pink-tailed Worm-lizard translocation trial) – ongoing. Translocation recipient sites are being established. Stage 2c (Pink-tailed Worm-lizard habitat restoration) – ongoing. Four hectares of habitat restoration has been undertaken since 2014. In 2014, 11 habitat islands were established across the former Blewitts pine plantation. The objective of the restoration works was to improve habitat connectivity between the two genetically distinct populations. Over the past three years, 10 of the 11 habitat islands have been colonized leaving only one island to be colonized before the two populations are effectively reconnected. Following the development of a Pink-tailed Worm-lizard habitat restoration method in collaboration with the ANU (McDougall, A., R.N. Milner, D.A. Driscoll & A.L. Smith (2016). Restoration rocks: integrating abiotic and biotic habitat restoration to conserve threatened species and reduce fire fuel load.	• Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve Draft Management Plan, 2017. • Project Plan, Pink-tailed Worm Lizard habitat restoration (NES Patch K_ = Stage 3 (2015/16). And Stage 4 Coombs (2016/17). • McDougall et.al., Restoration rocks: integrating abiotic and biotic habitat restoration to conserve threatened species and reduce fuel load. • Canberra South District, District Works Plan for the stockpiling of rock for Pink-tailed Worm Lizard habitat rehabilitation / habitat connectivity (A14423886). • Project Plan, Molonglo River Reserve, Pink-tailed Worm Lizard low impact monitoring research project (A14423883). • Project Plan, Patch K OAPZ Pink-tailed Worm habitat restoration (A14423887). • Osbourne and Wong; Examining the long term survival of Pink Tailed Work Lizards in Canberra Nature park, a case study in an urbanised landscape, Mount Taylor, 1990 to 2011. Dated March 2012. • Pink-tailed Worm Lizard Rehabilitation Guide (A14404837). • Molonglo River Reserve – proposed management of Patch K Pink-tailed Worm Lizard habitat and outer asset protection zone, dated September 2013.	Research projects are underway and planned. Early results of the low-impact monitoring method are promising although the definitive outcomes to knowing impacts of disturbance and proximity to urban areas is to be determined as this continues. **OBSERVATION: There are a range of research projects being undertaken and proposed to address and consider this commitment. Ongoing funding and secured research into the future is not known and may be a reasonable risk – and as such the likelihood is rated as Possible. EPSDD would benefit from showcasing the projects underway and the findings.**	Compliant with Observation	Medium Possible / Moderate	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
			Biodiversity and Conservation 25 (8), 1529–1542), three hectares of Pink-tailed Worm-lizard habitat restoration has been undertaken within fire management zones adjacent to Pink-tailed Worm-lizard habitat. The objective of the restoration works is to reduce fire fuel loads and provide habitat for the Pink-tailed Worm-lizard. Pink-tailed Worm-lizard have been detected in five of the seven habitat restoration sites surveyed and a second threatened species, Perunga Grasshopper, has also been found in one of the restoration sites.					
44	Amend the development boundary, adjacent to high and moderate quality Pink-tailed Worm-lizard habitat on the western edge to avoid: • direct impact from bushfire management – the Outer Asset Protection Zone (OAPZ) and Inner Asset Protection Zones (IAPZ) will be between the Pink-tailed Worm-lizard habitat and the development boundary; and • indirect impacts from urban development.	Boundary amendment will be incorporated immediately into the draft Planning and Design Framework for stage 2. The boundary amendment will be prescribed by a Territory Plan amendment, post completion of the Estate Development Plan (Estate Development Plan) for stage 2.	Complete. Stage 2 development boundaries were set by the Territory Plan Variation 281. The development boundary on the north western edge has been adjusted to avoid impacts on the high and moderate quality Pink-tailed Worm-lizard habitat.	• Planning and Development (Plan Variation No 281) Notice 2008, Notifiable Instrument NI2008–352, dated 21 August 2008. • Planning and Development (Plan Variation No 281) Commencement Notice 2008, CN2008–16, dated 10 December 2008.	EPSDD note that the Stage 2 development boundaries were set by the Territory Plan Variation 281. Comparison of the map of Future Urban Area on page 3 of Appendix 1 of the Structure Plan Molonglo and North Weston with Figure 3.1 Territory Plan Map on page 9 of the Territory Plan Variation 281 demonstrates that the development boundary on the north western edge has been adjusted to avoid impacts on the high and moderate quality Pink-tailed Worm-lizard habitat.	Compliant	No risk due to compliance	Complete

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Item 1	To ensure conservation outcomes and protect MNES adjacent to the development area in the lower Molonglo Valley, the ACT Government will make necessary amendments to the Structure Plan. (Also Items 4, 30 and 62 refer).		Whilst the commitment makes reference to the Structure Plan, which is part of the Territory Plan, it will be the Territory Plan (not specifically the Structure Plan) that will be varied in accordance with the Planning and Development Act 2007 as development in Molonglo progresses. On 10 August 2012 Technical Amendment to the Territory Plan No. 2012–24, which includes the applicable provisions arising from the Planning and Design Framework for Molonglo Valley Stage 2 came into effect. EPSDD and the former Land Development Agency commenced background planning investigations and assessments for Molonglo Valley Stage 3 in 2013–14. These investigations are now being undertaken by EPSDD and will inform the preparation of a Planning and Design Framework for Molonglo Valley Stage 3, currently being prepared by EPSDD.	• TP Variation 2012–41 (August 2012).	In relation to the Planning and Design Framework for Stage 2, the agreed changes to the Territory Plan as demonstrated in the Territory Plan Variation 2012 – 411 August 2012, do not provide a higher impact on the MNES than those outlined in the NES Plan. It should be noted that the change of one area adjacent to the river corridor to Medium Density RZ4 zoning may impact the MNES in the adjacent area, refer to p.5/6 of the Territory Plan Variation. 'As stated above, one RZ4 is located in proximity to the group centre and the local centre. The other is on a proposed future public transport loop linking the local centre with group centre. The second RZ4 area, to the north is in an area of high amenity close to the Molonglo River Corridor.' **OBSERVATION: Consider impacts to MNES in areas of development adjacent to the river corridor. It is however observed that we rate the likelihood of not considering MNES as Rare although the impact could be of a Major consequence.**	Compliant with Observation	Medium Rare / Major	Ongoing
Item 2	Following endorsement of the NES Plan under the EPBC Act, actions (or classes of actions) that will occur to implement the endorsed NES Plan may be approved by the Minister.		Complete. Commonwealth Minister provided approval on 20 December 2011. The approval has effect until 31 December 2041.	• Decision to Endorse the Molonglo Valley Plan for the protection of National Environmental Significance, dated 7 October 2011.	The NES Plan has been endorsed. It is noted that this Item may be applicable in future with actions (or classes of actions) conceivably requiring approval by the Minister.	Compliant	No risk due to compliance	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Item 3	Infrastructure within the river corridor comprises the following activities and will be staged to be most cost effectively developed (in the following order): • John Gorton Drive which includes the construction of dual bridges crossing the Molonglo River, • East-West Arterial Road bridge crossing of the Molonglo River, • Water quality control ponds; water mains; sewer mains and sewer pump stations, and • A combined sewer / pedestrian / cycle bridge.		On 27 April 2012, the ACT Government advised the Commonwealth that the ACT Government required a change to the order of this infrastructure to effectively manage the sequencing of land release. The following infrastructure has been completed within the River Corridor: • Sewer Pedestrian Bridge over Molonglo River, and associated sewer main approaches, and • Cravens Creek Pond. John Gorton Drive has been constructed through Molonglo Stage 1 and 2 to a point approximately one kilometre south of the Molonglo River, and has not yet extended into / over the River Corridor. The roadwork over the River Corridor is unlikely to be required before 2022. The East West Arterial has been constructed east of John Gorton Drive for a distance of approximately 1.1 kilometre. John Gorton Drive construction has recently commenced in Molonglo 3 south from William Hovel Drive, and will be initially constructed for a distance of approximately 900 metres. EPSDD completed construction of minor recreation facilities in the River Reserve adjacent to Coombs including a pedestrian trail linking 2 picnic shelters and boardwalk with lookout at Holdens Creek Hill. In addition, a pedestrian trail was constructed at Box–Gum Park linking the Holdens Creek Hill boardwalk. These facilities were constructed using low environmental impact methods and will help to control pedestrian movement through the reserve and away from areas of high conservation value. In 2016, EPSDD constructed creek crossings at Holden Creek Pond outflow and at Patch K. Orientation and interpretive signage was designed and installed along the woodland track to inform visitors of the ecological and cultural heritage values in the Reserve. A temporary boundary fence for Coombs Riverside was also constructed to control access into the Reserve.	• Drawing 23–15520-L001, dated 22/9/15, Holdens Creek Hill Boardwalk, Works as Executed. • Drawing, dated April 2014, Elevated Boardwalk revised alignment, Holdens Creek Hill Boardwalk. • Drawing C12040–004, dated 27/3/2014, for construction, Molonglo Link Bridge. • Drawing A301 to A308, dated June 2014, BGW walk, Molonglo Package A Works.	EPSDD note that on 27 April 2012, the ACT Government advised the Commonwealth that the ACT Government required a change to the order of this infrastructure to effectively manage the sequencing of land release. The following infrastructure has been completed within the River Corridor: • Sewer Pedestrian Bridge over Molonglo River, and associated sewer main approaches, and • Cravens Creek Pond. It is unclear if this impacted cost effectiveness. John Gorton Drive has not yet extended into / over the Molonglo River Corridor. The roadwork over the River Corridor is unlikely to be required before 2022. John Gorton Drive construction has recently commenced in Molonglo 3 south from William Hovel Drive, and will be initially constructed for a distance of approximately 900 metres. **OBSERVATION: Compliant for Stage 2 and pending for Stage 3 and as roads and other works continue, including the water / sewer mains and pump stations. The Terms of Reference for this audit did not include an assessment of cost effectiveness.** **The geographic reach can plausibly have a Major consequence.**	Compliant with Observation	High Unlikely/ Major	Ongoing

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Item 4	Variations to the East Molonglo development boundary to minimise the impact on MNES values. A particular focus of this is the reduction of impacts on moderate and high quality Pink-tailed Worm-lizard habitat. (Also Items 1 and 62 refers).		Changes to the river corridor boundary occurred after the Molonglo Valley Stage 2 Planning and Design Framework was approved in 2012. EPSDD and the former LDA commenced background planning investigations for Molonglo Valley Stage 3 in 2013–14. These investigations are now being undertaken by EPSDD and will inform the preparation of the Planning and Design Framework. The final buffer detail to Kama Nature Reserve and along the Molonglo River Corridor will be set through subsequent Estate Development Plan approvals.	• Molonglo Valley Stage 2 Planning and Design Framework (April 2012). • Molonglo Stage Three Interim Limited Area Planning and Design Framework (2017).	EPSDD note that changes to the river corridor boundary occurred after the Molonglo Valley Stage 2 Planning and Design Framework was approved in 2012. Figure 1 on p.8 of the Final Planning and Design Framework for Stage 2 demonstrates the alteration to the river corridor boundary. EPSDD and the former Land Development Agency commenced background planning investigations for Molonglo Valley Stage 3 in 2013–14. These investigations are now being undertaken by EPSDD and will inform the preparation of the Planning and Design Framework. The final buffer detail to Kama Nature Reserve and along the Molonglo River Corridor will be set through subsequent Estate Development Plan approvals. **OBSERVATION: Compliant for Stage 2 and pending for Stage 3.**	Compliant with Observation	Medium Rare / Major	Ongoing

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Item 5	Designing infrastructure that will occur in the river corridor to avoid or minimise impacts to MNES. This process includes: • re-aligning the location of the major bridges (as compared to the original location proposed in the Molonglo Structure Plan) to minimise impacts on moderate and high quality Pink-tailed Worm-lizard habitat, and • aligning other infrastructure to avoid moderate and high quality Pink-tailed Worm-lizard habitat and Box–Gum Woodland where this can be achieved. (Also Items 6, 31 and 63 refer).		Ongoing. Please see response to Table 1-Commitment 3.	• Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012). • Arboretum Woodland Conservation Area Operational Plan, August 2014 to 2017. • Molonglo River Reserve (Urban Section – 'the PARK') Operational Plan, August 2014 to 2017. • Molonglo River Reserve (Kama) Operational Plan, December 2014 to 2017. • Drawing 23–15520-L001, dated 22/9/15, Holdens Creek Hill Boardwalk, Works as Executed. • Drawing, dated April 2014, Elevated Boardwalk revised alignment, Holdens Creek Hill Boardwalk. • Drawing C12040–004, dated 27/3/2014, for construction, Molonglo Link Bridge. • Drawing A301 to A308, dated June 2014, BGW walk, Molonglo Package A Works. • Environmental Significant Opinion, Creek Crossings, Molonglo River Reserve, 2 August 2016. • 2766.ACT-CMTEDD. JGD3CEnvApprovals.PropForAdvice& ServicesAtT&C.20170928. • Figure 1 – NES Plan & AMS – Vegetation Mapping. • Figure 2 – Pink-tailed Worm Lizard Habitat Mapping.	The respective drawings (as examples) and site visit notes and photographs provide evidence of implementing construction methods onsite to protect Box–Gum Woodland and Pink-tailed Worm-lizard populations. The Environmental Significance Opinion demonstrates planning and methods of construction to mitigate impacts on Box–Gum Woodland and Pink-tailed Worm-lizard populations. EPSDD notes that in preparation for the construction of the remaining parts of John Gorton Drive and the bridge over the Molonglo River, efforts are being made to ensure infrastructure in the river corridor avoids or minimises impacts to MNES as is evidenced by earlier works in Molonglo such as the sewer bridge and other similar projects. Maps have been provided demonstrating the alignment of John Gorton Drive avoiding these MNES values. Any impacts on MNES will be examined to ensure the already agreed NES Plan "budget" approved by the Commonwealth is not exceeded. **OBSERVATION: The Ecological Management Guidelines were not finalised in an appropriate timeframe. There are some documents and site visit evidence to support implementation of key documents and design approaches, and as such impact on-ground can be assessed for areas such as Holdens Creek Boardwalk.** **Finalising and clearly adopting all key documents and ongoing clear noting of evidence in the planning and delivery of designed infrastructure will assist future compliance status. Due to the demonstration of on-ground activities, the likelihood of risk is noted as Unlikely, however the consequence could be Major, giving an overall rating of High.**	Compliant with Observation	High Unlikely / Major	Ongoing

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Item 6	A design principle to maintain ecological values within the East Molonglo development area where possible. (Also Items 5, 31 and 63 refer).		Complete. Design principles adopted by EDD and incorporated in contracts for design and construction projects.	• Molonglo River Reserve and Offset Areas, Ecological Management Guidelines, February 2015. • Molonglo Valley Stage 2 Planning and Design Framework (Version 1.1 September 2012).	*The Molonglo River Reserve and Offset Areas, Ecological Management Guidelines* are dated February 2015 but were not signed off until February 2018 due to maps in the document needing to be updated. The guidelines act as a principle document in defining the matters that reflect design and other elements (such as weed control and management aspects) to protect Box–Gum Woodland. It works in conjunction with the Molonglo Valley Stage 2 Planning and Design Framework. The respective drawings (as examples) and site visit notes and photographs provide evidence of implementing construction methods onsite to protect Box–Gum Woodland and Pink-tailed Worm-lizard populations. **OBSERVATION: The Ecological Management Guidelines were not finalised in an appropriate timeframe. There are some documents and site visit evidence to support implementation of key documents and design approaches, and as such impact on-ground can be assessed for areas such as Holdens Creek Boardwalk.** **Finalising and clearly adopting all key documents and ongoing clear noting of evidence in the planning and delivery of designed infrastructure will assist future compliance status. The geographic reach can plausibly have a Major consequence.**	Compliant with Observation	High Unlikely / Major	Ongoing
Item 7	A commitment to avoid impacts on MNES within West Molonglo.		Complete. MNES in West Molonglo, referred to as West Belconnen were considered through the variation to the Territory Plan and amendment to the National Capital Plan. This area is included in the West Belconnen Strategic Assessment.	• SA02 Letter of endorsement Commitment 21 and 22.	The variation to the Territory Plan No 351—West Belconnen Urban Development commenced on 22 July 2016. This includes the entire West Molonglo area (map on p.8 of the Plan Variation 351 Notifiable Instrument NI2015–610), however, it appears that some of the areas identified as offsets in Figure 1 of the 2016–17 Annual Report are now within the Future Urban Area. This is due to the changes in mapped Box–Gum Woodland as a result of the David Hogg mapping in 2013. Commonwealth letter notes that the Box–Gum Woodland areas set aside in West Molonglo are obsolete and no further action needs to be taken.	Not applicable	Not applicable	Complete

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Item 8	The ACT Government will ensure that all construction activities (whether in the urban area or in the river corridor) will be subject to construction environmental management plans (CEMPs). These CEMPs will help to ensure that unnecessary impacts from construction (e.g. through the uncontrolled movement of machinery) are avoided. A detailed description of the content of CEMPs is provided in Section 4. (Also Items 32 and 64 refer).		Ongoing. Please see response to Table 1-Commitment 4.	• Contractor Environmental Management Plan, Coombs Residential Estate Stage 1, July 2013, Group One. • Construction Environmental Management Plan, North Coombs. • Environmental Management Plan, Coombs Residential Estate Stage 3, July 2013. • Environmental Management Plan, Cravens Creek Water Quality Control Pond, June 2015. • EPA Approval – CEMP Denman Prospect 1B Stages 2A 2B, dated February 2017. • EPA Approval, CEMP Deep Creek Geotechnical Investigations, dated May 2017. • Construction Environmental Management Plan, Denman Prospect Geotechnical Investigations, NGH environmental, November 2016. • Contractor Environmental Management Plan, Denman Prospect Stage 1A1, dated February 2015. • Construction Environmental Management Plan, East West Arterial Road Stage 2 and Cravens Creek Watermains, Rev 0.4. • Construction Environmental Management Plan, John Gorton Drive Extension Stage 2A, December 2013. • Construction Environmental Management Plan, Asset relocation works John Gorton Drive Stage 1D, July 2012. • Construction Environmental Management Plan, Molonglo 3 Road and Intersection Infrastructure, June 2017. • Construction Environmental Management Plan, Molonglo Boundary fence Construction, May 2017. • Environmental Management Plan, Geotechnical investigation at Coppins Crossing Sewer pump Station and Rising Main, February 2012.	This commitment is for CEMPs to be in place and independently monitored to manage and mitigate impacts of development in the river corridor and the development area and is all encompassing. This impacts the resourcing required to fully meet this commitment. The requirement to independently monitor CEMPs aims to ensure that contractors are undertaking works in accordance with the CEMP. This involves monitoring of construction activities by an agency/person(s) that are not involved in onsite construction activities. The Environment Protection Authority have advised EPSDD that they are undertaking regular checks of the construction sites within the Molonglo Strategic Assessment area to ensure construction activities are undertaken in accordance with CEMPs. No breaches have been recorded to date. CEMPs (31 in total to date) have been prepared for approved estate developments within the strategic assessment area (Molonglo 1 and 2). EPSDD state they have incorporated the requirement for CEMPs in all capital works infrastructure documentation for Molonglo and have engaged a site surveillance officer to monitor capital works projects in Molonglo. The requirement for CEMPs is noted by ESPDD as being incorporated into all capital works documentation for the Molonglo River Park. A sample review was undertaken as part of this audit. The CEMPs and associated documents show evidence of relating to and acknowledging Pink-tailed Worm-lizard and Box–Gum Woodland protection needs and seek to actively mitigate construction impacts. The ability to monitor and ensure compliance of CEMPs across the entire development area is cumbersome, with much on-ground activity led by developers and builders. This requires ongoing resourcing.	Compliant	No risk due to compliance	Ongoing

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				• Construction Environmental Management Plan, Molonglo Habitat Restoration Works. • Construction Environmental Management Plan, Pink-tailed Worm Lizard Protective Fence, BGW Pedestrian Trail Package B, Rev 1, dated July 2014. • Construction Environmental Management Plan, Geotechnical investigations, Molonglo Stage 3, January 2016. • Construction Environmental Management Plan, Molonglo 2, October 2012. • Construction Environmental Management Plan, Asset relocation works John Gorton Drive Stage 1D, February 2015. • Construction Environmental Management Plan, Phase 2 ESA, Molonglo Stage 2, August 2012. • Construction Environmental Management Plan, North Coombs. • Construction Environmental Management Plan, North Wright Residential Estate, October 2017. • Construction Environmental Management Plan, North Wright and Coombs Geotechnical Investigations, April 2017. • Construction Environmental Management Plan, Remediation of former sheep dip, December 2014. • Construction Environmental Management Plan, Restoring vertical habitat structures. • Construction Environmental Management Plan, Uriarra Road Intersections and JGD Link Road.				

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Item 9	Within the strategic assessment area fire management will be aimed at the protection of both built assets and MNES values. This will be achieved through the identification of appropriate asset protection zones and the application of hazard reduction techniques that will both: • ensure that the standards for fuel loads in the Strategic Bushfire Management Plan are met, and • protect MNES values through the use of sympathetic management techniques.		Asset protection zones have been identified as part of the operational plan for the river corridor and as part of the Bushfire Risk Strategy undertaken by the Land Development Agency which has Emergency Services and the Fire Management Unit of Transport Canberra and City Services support and will set the management requirements both within and immediately outside the future urban development boundary in Denman Prospect taking into account Box–Gum Woodland. Additional controls for asset protection and management will be included in Estate Development Plans.	• Denman Prospect and the Molonglo River Corridor Bushfire Risk Assessment. • Molonglo Bushfire Risk Strategy letter.	EPSDD note that asset protection zones have been identified as part of the operational plan for the river corridor and as part of the Bushfire Risk Strategy undertaken by the Land Development Agency which has Emergency Services and the Fire Management Unit of Transport Canberra and City Services support. These will set the management requirements both within and immediately outside the future urban development boundary in Denman Prospect taking into account Box–Gum Woodland. Additional controls for asset protection and management will be included in Estate Development Plans. Site visit noted that the Parks and Conservation Service staff liaise with the Fire Management Unit staff to discuss and account for both asset and ecological protection for on-ground activities. **OBSERVATION: Evidence provided demonstrates that MNES values have been considered. Ongoing monitoring of fire management will be required to ensure this commitment is met.**	Compliant with Observation	Medium Rare / Major	Ongoing
Item 10	It is also important to note that under Division 3.3 of the Nature Conservation Act 1980, Pink-tailed Worm-lizard has been declared a Vulnerable species and Natural Temperate Grassland and Box–Gum Woodland are declared endangered communities. The effect of these statutory declarations is that these species and communities need to be managed in accordance with a prescribed Action Plan, prepared by the Conservator for Flora and Fauna.		The Nature Conservation Act 1980 has been amended to reflect this requirement.	• Nature Conservation Act 12 June 2017 – 15 June 2017. • Nature Conservation Act 16 June 2017 https://www.environment.act.gov.au/cpr/review_of_the_nature_conservation_act.	It is noted that Pink-tailed Worm-lizard is listed as Vulnerable and Natural Temperate Grassland and Box–Gum Woodland are endangered ecological communities. EPSDD note that the Nature Conservation Act 1980 has been amended to reflect this requirement.	Compliant	No risk due to compliance	Complete

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Item 11	Construction in the Molonglo Valley Stage 2 and Stage 3 will not commence before completion of the respective Planning and Design Frameworks for both Stages 2 and 3. The final Planning and Design Frameworks will incorporate NES actions and commitments.		The Planning and Design Framework for Molonglo Valley Stage 2 prepared by EPSDD was approved on 17 April 2012. EPSDD and the former Land Development Agency commenced background planning investigations and assessments for Molonglo Valley Stage 3 in 2013–14. These investigations are now being undertaken by EPSDD and will inform the preparation of a Planning and Design Framework for Molonglo Valley Stage 3, currently being prepared by EPSDD.	• Molonglo Valley Stage 2 Planning and Design Framework (April 2012). • Molonglo Stage Three Interim Limited Area Planning and Design Framework (2017). • email from Manager, Land Supply and Policy.	EPSDD note that the Planning and Design Framework for Molonglo Valley Stage 2 prepared by EPSDD was approved on 17 April 2012. EPSDD and the former Land Development Agency commenced background planning investigations and assessments for Molonglo Valley Stage 3 in 2013–14. These investigations are now being undertaken by EPSDD and will inform the preparation of a Planning and Design Framework for Molonglo Valley Stage 3, currently being prepared by EPSDD. The Interim Planning and Design Framework for Stage 3 notes that 'A final Planning and Design Framework for Molonglo Valley Stage 3 is due for release in mid–2017.' This has not yet occurred. The Interim Planning and Design Framework for Stage 3 also notes that 'There are no MNES that will be impacted in the area covered by this interim Planning and Design Framework." **OBSERVATION: Compliant for Stage 2 and pending for Stage 3. In future, ensure that final documents are in place before construction commences, rather than producing interim documents. The likelihood is Possible as this could occur in the next five years and the consequence would be Major.**	Compliant with Observation	High Possible / Major	Ongoing
Item 12	The ACT Government, as the proponent, will ensure that all development concerning MNES in the Strategic Assessment area is incorporated into any future development application and associated documentation to ensure any Commonwealth requirements are reflected in the decision by the Environment and Planning Directorate.		Ongoing – for consideration/application at development assessment stage.	• MSA – Item 12 – Process for development.	EPSDD notes that development applications are referred to the Impact Assessment team and the Conservator for comment. Evidence demonstrates that this is occurring for development applications in the Molonglo Valley Strategic Assessment area. It is important to continue to ensure that Commonwealth requirements for MNES are incorporated into decisions by EPSDD in relation to development applications in the Molonglo Valley Strategic Assessment area.	Compliant	No risk due to compliance	Ongoing

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Item 13	The ACT Government will monitor and report annually to the public on the implementation of the NES Plan. An annual report highlighting the conservation outcomes achieved in the previous year will be published by the ACT Government and provided to the Department of Environment. The Report will include the monitoring results on the condition of the MNES, conservation outcomes (as listed in Section 4) and the outcomes of enhancement projects.		Ongoing. To be finalised by the end of November each year.	• Annual Report for Molonglo Valley MNES Plan 2016–17 (November 2017). • Annual Report for Molonglo Valley MNES Plan 2015–16 (dated January 2017). • Annual Report for Molonglo Valley MNES Plan 2014–15 (November 2015). • Annual Report for Molonglo Valley MNES Plan 2013–14 (November 2014). • http://www.planning.act.gov.au/topics/current_projects/studies/molonglo_valley_stage_2_planning_project/molonglo_valley_strategic_assessment.	Annual Reports have been prepared each year (apart from 2011–12) and submitted to the Department of the Environment and are all publically available, except for the 2013–14 Annual Report. The annual report for 2015–16 appears to be dated January 2017 which would indicate it was two months late. The annual reports are supported by diagrams and tables to demonstrate outcomes achieved, monitoring results and (partly only) conservation outcomes of projects. The annual report for 2013–14 included a section for outcomes of enhancement projects. This does not seem to have continued for future annual reports. It is recommended that it should be included in future annual reports as it is an important component in reporting on commitments in the NES Plan. The map of the Molonglo Valley Strategic Assessment area in the 2017–18 Annual Report should: 1. remove West Molonglo as it is now part of the strategic assessment for West Belconnen, and 2. the layer "offset areas" is labelled incorrectly and should be changed to "management areas" to avoid confusion. "Offset areas" only include Kama Nature Reserve, Patch GG and the Molonglo River Corridor. **OBSERVATION: The timelines have not been fully met so the likelihood is rated Unlikely and due to consistency, this would be of Minor consequence.**	Non-compliant (timeline not met)	Medium Unlikely / Minor	Ongoing

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Item 14	Develop an Adaptive Management Strategy to set out the framework for achieving the NES Plan's commitments through monitoring, evaluation, experimental design, reporting, auditing and continuous improvement processes. The Strategy will inform the content and timing of specific management plans and actions to ensure a consistent, integrated and efficient application of adaptive management principles and practices to achieve long term conservation outcomes for MNES. The approved Adaptive Management Strategy will be submitted for approval by the Minister (Commonwealth) or delegate.		Complete. The AMS was endorsed by the Commonwealth Government on 7 August 2013.	• Molonglo Adaptive Management Strategy, dated May 2013.	An Adaptive Management Strategy was developed and endorsed by the Commonwealth Minister on 7 August 2013. The document includes all of the required components.	Compliant	No risk due to compliance	Complete

ACTION	COMMITMENT	TIMING (NES PLAN)	STATUS UPDATE FROM 2016–17 ANNUAL REPORT	AUDITED REFERENCES/DOCUMENTS	AUDITOR COMMENTS	AUDIT STATUS	RISK RATING	COMMITMENT STATUS
Item 15	The NES Plan and its associated actions will to be audited by an independent, third party expert every five years, for a 30 year period. The audit reports are to be provided to DOE for their consideration.		Incorporated as an action in the AMS. Audit to be completed by 7 May 2018. Timing of audit confirmed by correspondence from Department of Environment and Energy dated 1 August 2017.	• Commonwealth endorsement notice on http://www.environment.gov.au/system/files/pages/b42a89fd–8b94–43d0–8721–81b01ff35a57/files/molonglo-endorsement-instrument.pdf. • email with confirmation of due date from Commonwealth.	The Commonwealth endorsement date was 7 October 2011. The audit should have been completed by 7 October 2016 (every 5 years). The audit is now due on 7 May 2018 as agreed to by the Commonwealth, however this agreement was received on 1 August 2017 which is after the original date that the audit was to be completed. **OBSERVATION: The audit is 19 months overdue and this is the only time that an independent party is able to review the progress of the strategic assessment so this substantial delay could affect the ability to determine if any issues are occurring at this early stage of project implementation. Future audits should be completed on time adhering to the five year timeframe.** **This report represents the first audit of the Molonglo Valley Strategic Assessment by an independent third party.**	Compliant with Observation	Medium Possible / Minor	Ongoing
Item 16	Appoint an independent, third party auditor and develop a customised audit protocol to ensure that: • commitments made by the ACT Government in the NES Plan are being adhered to, and • conservation outcomes for the MNES are being achieved.		As above. Required every 5 years. Audit to be completed by 7 May 2018. Timing of audit confirmed by correspondence from Department of Environment and Energy dated 1 August 2017.	• Commonwealth endorsement notice on http://www.environment.gov.au/system/files/pages/b42a89fd–8b94–43d0–8721–81b01ff35a57/files/molonglo-endorsement-instrument.pdf. • email with confirmation of due date from Commonwealth.	The Commonwealth endorsement date was 7 October 2011. The audit should have been completed by 7 October 2016 (every 5 years). The audit is now due on 7 May 2018 as agreed to by the Commonwealth, however this agreement was received on 1 August 2017 which is after the original date that the audit was to be completed. **OBSERVATION: The audit is 19 months overdue and this is the only time that an independent party is able to review the progress of the strategic assessment so this substantial delay could affect the ability to determine if any issues are occurring at this early stage of the project implementation. Future audits should be completed on time adhering to the five year timeframe.**	Compliant with Observation	Medium Possible / Minor	Ongoing
Item 17	The Treasury Directorate will ensure that commitments and actions in the NES Plan are funded.		Ongoing. EPSDD excluded this Item from the scope of the audit and indicated it is being undertaken separately.					Ongoing

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Conclusions and Recommendations

The ACT Government is at the six year interval of a 30 year strategic assessment.

The recommendations below have been derived from the results of this independent audit and they are offered on the basis that the ACT Government has the opportunity to show leadership in the ongoing management of this strategic assessment.

The successful implementation of the Molonglo Valley Strategic Assessment is critical to MNES being protected in accordance with the EPBC Act.

Recommendations

1. **It is recommended that the ACT Government** completes all the Corrective Action Requests identified in this report within the indicated timeframes.
2. **It is recommended that the ACT Government** ensures ongoing resourcing and funding for the maintenance and enhancement of the ecological condition of MNES within the strategic assessment area.
3. **It is recommended that the ACT Government** adheres to timing requirements for all of the commitments.
4. **It is recommended that the next Audit be carried out by May 2022** and that the ACT Government seeks agreement from the Commonwealth for this due date by 30 June 2018**.**
5. **It is recommended that the ACT Government** develops and implements an ISO9001 or similar framework for document control. This will also assist in retaining all the evidence and information required to demonstrate compliance with each and every commitment.
6. **It is recommended that the ACT Government** incorporates climate change resilience considerations in the management of MNES in the strategic assessment area.
7. **It is recommended that the ACT Government** gives urgent consideration to the urban edge effect that is apparent around the Molonglo River Corridor, which is likely to be exacerbated as each of the new suburbs in the later stages of the Molonglo Valley Strategic Assessment area are developed.
8. **It is recommended that the ACT Government** notes the Key Risks section and Observations detailed in the Audit Table and incorporates all the recommendations in this section into future management.
9. **It is recommended that the ACT Government** further investigates the commitments that have been termed *Undetermined*.
10. **It is recommended that the ACT Government** ensures adaptive management principles are carefully scrutinised and considered for incorporation into implementation of the commitments for the NES Plan.
11. **It is recommended that the ACT Government** considers Indigenous approaches to land management for MNES protection in the Molonglo Valley Strategic Assessment area.
12. **It is recommended that the ACT Government** ensures that all the research undertaken as a function of the Molonglo Valley Strategic Assessment and the NES Plan is made publicly available on the web, is accessible and easy to find, and includes historical research as well as the most recent scholarship and reports.

Appendix A

Audit Team Qualifications

LEAD AUDITOR

Dr Therese Flapper is Arup's Environment & Resources Leader in Canberra and Australasia Water Skills Leader. Therese is an accredited Lead Auditor in accordance with ISO19011, ISO9001, ISO14001, ISO22001 as well as in Drinking Water and Recycled Water Quality. Therese has substantial and practical experience with regulatory compliance of schemes, urban policy, validation and quality monitoring ensuring successful scheme delivery, integration between planning and operations.

https://au.linkedin.com/pub/dr-therese-flapper/26/6b7/910

PEER REVIEWER

Tim Cook is Arup's NSW/ACT Environment Leader and is an internationally qualified Lead Environmental Auditor (Exemplar Global 113135) with experience in public and private organisations. Over the last 19 years, Tim has worked primarily in the fields of site environmental management (planning, construction and operations) and environmental legislative compliance. He has a diverse understanding of environmental responsibilities, sustainability objectives, community consultation and a demonstrated ability to deliver environmental solutions.

AUDIT MANAGER

Serena Farrelly holds a Bachelor of Arts/Science with majors in Sociology and Human Ecology at ANU, which included a broad range of environmental management subjects.

Serena has worked in Nature Conservation Policy in the ACT Government for 4 years, focussing on the development of the ACT Environmental Offsets Policy and the management of threatened species and ecological communities in the ACT through her work with the ACT Scientific Committee. During her time at OCSE, she has worked on the Independent Audit of the Gungahlin Strategic Assessment.

AUDIT SUPPORT

Kirilly Dickson holds a Bachelor of (Environmental) Engineering degree with Honours from the University of Wollongong and a Certificate in General Management from Harvard Business School.

Kirilly worked in the utility sector for more than 14 years managing the environmental, safety and quality requirements for the water business including audit and risk functions.

Kirilly recently audited the implementation of the ACT Government's climate change policy on behalf of the Commissioner, and is evaluating the restoration of the Lower Cotter Catchment.

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